Systems Competence:

Operationalization, Evaluation and Theoretic Classification

Dissertation

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Diplom-Psychologen

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Summary

This thesis pursues the question of how trainings for counseling competences have to be laid out to be effective and how evaluation procedures have to be set up to capture the competence development in this field.

The construct systems competence is the starting point for these thoughts. It lists the competences, skills, abilities, and knowledge aspects that are necessary for working with complex, social systems. It is based on the theoretical considerations of Synergetics; a systems theory that describes the creation of a system's macroscopical, coherent patterns upon the self-organization of its system elements without external influences. The construct systems competence describes counselors' competences that are needed to provide the conditions for self-organization in individuals or teams. In order to allow for appropriate operationalization, three facets are selected: Basic Knowledge of Synergetics, Idiographic System Modeling, and Generic Principles. For each, a training program and specific evaluation instruments are developed.

The findings of competence development research suggests various taxonomies of competences and models. Also, conditions are described which help to enhance competences. Based upon these suggestions a training and evaluation instruments are developed. The training puts a strong emphasis on open-learning settings, complex scenarios, a high degree of experiential learning, reflection and exercises. Since the improvement of counseling competences is the subject of this thesis two of the selected facets are operationalized and evaluated in counseling interviews (Idiographic System Modeling, Generic Principles). The basic knowledge of Synergetics is evaluated via a knowledge test.

In 2007, a preliminary study among the members of the professional organization "Systemische Gesellschaft" and "Deutsche Gesellschaft für Systemische Therapie und Familientherapie" revealed that competence assessment of participants in training classes is very common. But, the procedures of these assessments vary greatly in their systematics, and formal assessments with checklists are very rare. Therefore, evaluation instruments are developed consisting of a mixture of assessment modes including different perspectives and levels of external rating. Different self-assessment and observation schemes are applied. The training follows the approach of a spiral curriculum accompanied by a pre-post evaluation and an intermediate evaluation between

two evaluation rounds. University students and participants of a systemic training course make up the sample of this study.

The results of the study show the participants improved their competences in all three facets. The most significant improvement is observed for the gain of knowledge whereas university students receive higher scores compared to the other participants of the training. For the two counseling procedures with which the Idiographic System Modeling and the Generic Principles are operationalized, the degree of the observed improvement strongly depends on the applied evaluation perspective. Whereas external raters state an improvement, the respective counselors do not report any. One further outcome of this thesis is the reorganization of the construct systems competence according to the findings of competence research. The findings of this thesis can be utilized to improve feedback methods in counseling trainings and to reach more objective means of competence assessment in adult education.

Zusammenfassung

Die vorliegende Arbeit hat zum Ziel ein Training zum Aufbau von Beratungskompetenzen zu entwickeln und die Kompetenzentwicklung mit geeigneten Erhebungsinstrumenten und -verfahren zu erfassen.

Als Ausgangslage für diese Überlegungen dient das Konstrukt Systemkompetenz. Darin sind Kompetenzen, Fähigkeiten, Fertigkeiten und Wissensgebiete aufgeführt, die für das professionelle Arbeiten mit komplexen sozialen Systemen notwendig sind. Das Konstrukt basiert auf den theoretischen Überlegungen der Synergetik, einer Systemtheorie, welche die Entstehung und Aufrechterhaltung von makroskopisch kohärenten Mustern von Systemen beschreibt, wobei diese Muster allein auf Grund der Selbstorganisation der Systemelement ohne äußerlichen Einfluss entsteht. Systemkompetenz beschreibt diejenigen Kompetenzen von Beratern und Therapeuten, um diese Selbstorganisationsprozesse bei Individuen oder einem Team zu ermöglichen. Um eine angemessene Operationalisierung zu gewährleisten, werden drei Facetten des Konstrukts ausgewählt: Grundlagenwissen der Synergetik, Idiographische Systemmodellierung und Generische Prinzipien. Für jede dieser Facetten werden ein Trainingsprogramm und spezifische Erhebungsinstrumente entwickelt.

Die wissenschaftliche Literatur über Kompetenzen führt eine Reihe von Kompetenztaxonomien und -modellen auf. Auch die Bedingungen, unter denen Kompetenzen weiterentwickelt werden können, sind beschrieben. Die Erkenntnisse fließen in die Gestaltung der Trainingseinheiten und der Erhebungsinstrumente ein, bei denen offene Lernsituationen, komplexe Szenarien, ein hoher Grad an Erfahrungslernen, Reflektion und Übung eine besondere Bedeutung erhalten. Da diese Arbeit die Entwicklung von Beratungskompetenzen zum Ziel hat, werden zwei der ausgewählten Facetten in Beratungsgesprächen evaluiert (Idiographisce Systemmodellierung, Generische Prinzipien). Das Grundlagenwissen der Synergetik durch einen Wissenstest erhoben.

Eine Vorstudie bei den Mitglieder der beiden Dachorganisationen "Systemische Gesellschaft" und "Deutsche Gesellschaft für systemische Therapie und Familientherapie" im Jahr 2007 zeigte, dass die Kompetenzbewertung von Teilnehmern in Ausbildungsklassen ein übliches Verfahren ist. Allerdings variiert dabei stark die Systematik und zudem sind formale Bewertungen mit Verhaltensindikatoren sehr selten. Die entwickelten Erhebungsinstrumente integrieren verschiedene

Bewertungsmethoden, Perspektiven und externe Beobachter. Zum Einsatz kommen Selbsteinschätzung und verschiedene Beobachtungsverfahren. Das Training ist nach dem Spiralcurriculum aufgebaut und wird von einem Prä- und Posttest begleitet. Zusätzlich wird zwischen den beiden Trainingsphasen ein Zwischentest durchgeführt. Die Zielgruppe dieser Arbeit besteht aus Studierenden an Hochschulen und Teilnehmern systemischer Weiterbildungen.

Die Ergebnisse zeigen, dass sich die Teilnehmer in allen drei Facetten verbessern. Die bedeutsamste Verbesserung zeigt sich im Wissenstest, wobei die Studierenden hierbei besser abschneiden als die anderen Teilnehmer. In den Evaluationen der Idiographischen Systemmodellierung und der Generischen Prinzipien, die als Beratungsgespräch operationalisiert und evaluiert werden, ist der Kompetenzgewinn sehr stark von der Evaluationsperspektive abhängig. Externe Beobachter geben Verbesserungen für beide Gesprächsarten an, die jeweiligen Berater sehen allerdings keine Verbesserungen in ihrem eigenen Beratungsverhalten. Ein weiteres Ergebnis dieser Arbeit liegt in der Umstrukturierung des Konstrukts Systemkompetenz entsprechend des Forschungsstands in der Kompetenzforschung. Die Erkenntnisse dieser Arbeit können dazu beitragen, Feedbackmethoden in der Beratungsausbildung von Beratern zu verbessern und in der Erwachsenenbildung zu einem objektiveren Zugang bei der Kompetenzbewertung zu gelangen.

Preface and Acknowledgment

When I first thought about writing a doctoral thesis I intended to pick a topic that is connected to a systemic perspective and relevant for praconers at the same time. I found both by meeting Christiane Schiersmann and her approach in counseling studies and Günter Schiepek offerering to work on the construct systems competence.

First of all, I would like to thank my two doctoral adviser Prof. Dr. Christiane Schiersmann and Prof. Dr. Günter Schiepek. With the area of counseling studies, Prof. Dr. Schiersmann introduced me to a so far unknown interdisciplinary field of research in which the disciplines of educational science and psychology can benefit from each other. She especially regarded the compatibility of theoretical fundamentals and the needs and constraints governing in the area of application of counseling. Prof. Dr. Günter Schiepek introduced me to a new level of systemic considerations and he taught me how the complexity of human sensation and behavior can be described without disregarding it. His catching enthusiasm and amazing energy were - and still are - a great inspiration.

My very special thanks goes to the participants of my trainings and the corresponding quite extensive evaluations which I taught in summer and fall 2006. Without them, this thesis never would have come come into being. First, there are the students of the university class "Beratung komplexer Systeme" at Technische Universität Darmstadt. Second, there are the participants of "D8" in whose two year training I was able to give my lectures. With both groups, I spent a very intensive time of discussions and mutual learning. Also, thanks to Herbert Kämmerer for giving me the possibility to hold my training and evaluation in his institute, and for the most pleasant cooperation with Christiane Dette and Dr. Tina Gürtler.

Working at Fraunhofer-Gesellschaft for most of the time during my studies, I have met many fellow postgraduates with whom I shared the joys - but yet the predominant sorrows - of a Ph.D. student. As well, my supervisors during this time, Prof. Dr. Matthias Hemmje (now FernUniversität Hagen), Dr. Claudia Niederée (now L3S, Hannover), Dr. Thomas Risse (now L3S, Hannover), Dr. Michael Erben-Russ, and Kuno Blank (both Fraunhofer-Gesellschaft headquarters), without whose ambition and support this thesis would not have come into existence.

I would like to thank Gisela Stöcker, head of the library of psychology at TU Darmstadt, who

Chapter 1

Introduction

Completing a PhD requires - among other things - constant self-motivation and alignment with the ultimate goal of defending the thesis. The recurring perturbations in the process of theoretical and empirical research phases often enough conceal this ultimate goal and the path leading to it. The complexity and the length of such a research project usually cannot be foreseen at the beginning. Keeping the process running in the desired direction demands various competences from the PhD-student. Most of those competences can be partly described as systems competence.

Although, the construct systems competence describes such competences, originally it was not developed to describe a PhD-student's competences but the competences needed for working with complex, social systems. The conceptualization and the operationalization is the core of this thesis with a special focus on capturing the gain of competence for selected aspects.

This chapter gives an introduction into the topic, presents the intention of the research conducted and the structure of this thesis. Lastly, the classification of this thesis into the field of educational science is given.

1.1 Motivation

"... Suppose, there is Richard, who is working in a large consulting company with a systemic orientation as a consultant providing service for other companies. More precisely, Richard supports his clients (individuals or teams) in finding solutions to their problems. In spite of having received a good university education and excellent grades, there is little he knows about counseling. Richard's job is demanding; constantly he is confronted with complex problems, stressful situations, and negative emotions. At times, the job seems hardly manageable and, often enough, he is clueless about what to do next.

Frustrated with the current situation, Richard talks to his manager Linda. Understanding his concerns, she decides to send him to a systemic training program in order to advance his skills. She hopes - as a result of this training - that Richard will be more competent. She is hoping he will improve his counseling techniques, deal better with the upcoming stress and improve his social skills. As well, she hopes he will learn some theoretical background knowledge and some more methods to describe and capture system dynamics.

Some time after Richard's training has started, Linda starts wondering. Although, she does not question the quality of the training organization or the benefit of the training itself, the training is costly and Richard will be missing a number of working days. After all, she has to justify the training costs. She would like to know if there are any objective measures to indicate Richard's gain in competence. She knows he will receive a certificate after his schooling but Linda is unconfident about its explanatory power with respect to single competences. A competence profile showing the gain in competence throughout the run of Richard's schooling would help her to argue the training's cost to her supervisors. In addition, she would be more confident that Richard has become more competent compared to his state before the training..." *(also see figure 1.1)*

1.2 Intention of Thesis

This thesis aims to reassess the dimensionality of the construct systems competence with respect to the state-of-the-art in Synergetics and competence research making a statement about the suitability of the construct as a competence model. The core of the work lays a foundation for the operationalization of the construct. For this purpose selected aspects are operationalized into training components and a training is conducted in two sequential phases. This training is evaluated with a set of specially developed evaluation instruments that measure the gain of competence. Thus, this thesis closes the prevailing gap between the conceptualization of the construct and its empirical validation.

The work conducted focuses on the question which evaluation procedure is appropriate to capture the gain of competence in counseling training, more precisely in systemic counseling. The competence assessment has to be scientifically founded but in its procedure pragmatic and economic enough to be accepted in counseling training institutions. To identify the appropriate assessment procedure, several procedures are applied simultaneously in order to select the most meaningful approach and suggest it for implementation in trainings. For this purpose, university students and participants of a systemic training institution are subject to a training in which knowledge and counseling competences are practiced and the development is monitored by several evaluations.

The insights gained from this thesis' research is thought to have an impact on the procedures of quality management in systemic institutions. But furthermore, the results can provide sug-
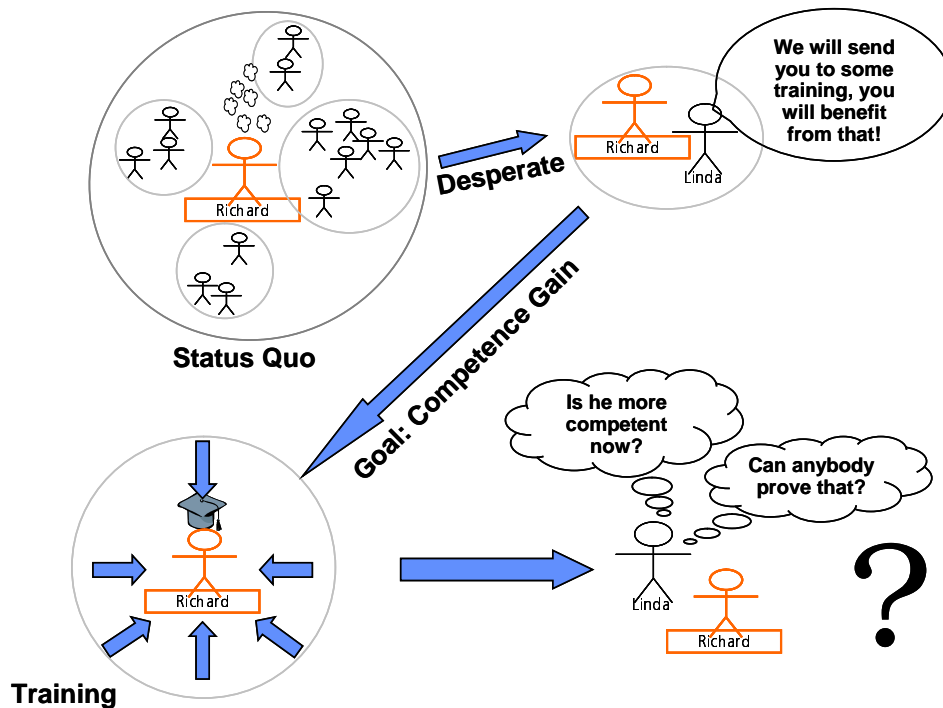
Figure 1.1: Importance of Providing Evidence about Competences

gestions about arranging learning settings in counseling trainings and means how to capture the gain in counseling competence. The evaluation procedures developed and evaluated in this thesis provide standardized procedures in the assessment of counseling competences. Although the application area of this thesis is systemic counseling the basic insights can be transfered to other training curricula independent of the counseling approach.

1.3 Structure of Thesis

This thesis is structured into two parts. The first part comprises the presentation of the state-of-the-art for the areas of Synergetics and systems competence, competence research, and for diagnostics. As well, the first part describes the results of a preliminary study, conducted to gain insight into the practice of systemic trainings organizations. Concluding this part, the problem statement is presented. The second part contains the results of the empirical research and the consequences that can be derived. At first, the evaluation design and methods applied in this thesis are presented before the results gained with the developed instruments are portrayed. The thesis closes with the discussion of the findings and future work is suggested.

Chapter 2, at first, introduces the theory of Synergetics by describing the basic concepts of this theoretical framework that are integrated in the base model of Synergetics and depicts the self-organization nature of complex systems. The transferability of the theory that originated in theoretical physics to different sciences is demonstrated by giving empirical evidence. After this, the origins and development of the construct systems competence is presented before discussing the construct's dimensions in detail. Two aspects of these dimensions which are crucial for the scope of this thesis are presented in depth: Idiographic System Modeling and Generic Principles. The chapter is concluded by discussing methods for evaluating system-competent behavior.

The concept of competences is presented in chapter 3. At first, the etymology of the term competence is reflected. Next, the discussion of the definition of competence leads to the presentation of competence models. The most elaborated competence model by Erpenbeck and von Rosenstiel is presented in detail, since it is predominant in the current discussion. To distinguish the concept competence from related concepts qualification, key qualification, key competence, metacompetence, and resource are presented. As competence development is important in the context of this thesis, it is described and the major constituents of competence development discussed. At last, the assessment of competences, basic approaches, and evaluation instruments are presented.

Chapter 4 provides an overview of the basic terms in psychological diagnostics, since they apply to instruments of competence development. This section discusses the primary and secondary performance criteria of diagnostics, approaches and inherent challenges. As well, there is an overview of the advantages and disadvantages of status diagnostics and process diagnostics. The chapter is concluded by the basics of systemic diagnostics.

The usage of evaluation instruments for assessing the competence development of participants in systemic training courses is described in chapter 5. The preliminary study was conducted in summer of 2008, asking systemic training organizations in Germany about their procedures of assessing the participants' competence level.

The implications from the presented state-of-the-art areas "Systems Competence", "Competence", "Diagnostics", and "Quality Management" are compiled as a problem statement in chapter 6. They are integrated and make up the goal of this thesis.

Chapter 7 presents the evaluation design and methods developed in this thesis. The objects of investigation are defined, the materials and the evaluation procedure are presented. Subjects of the evaluation were university students and participants in a systemic training institution who took part in a modular training including the respective evaluation with three different evaluation instruments.

The results are presented in chapter 8. First, the results of the knowledge test WIGSY are described and the knowledge gain for the complete test and the respective subsections presented. The presentation of the results takes into consideration the development across the measurements and the differences between the subgroups of this study. The second part presents the results of the Idiographic System Modeling. The findings include the interview duration, ratings by participants, ratings by external raters, and the quality of the system models. Section three of this chapter describes the results of the implementation of the Generic Principles. This includes,

again, the interview duration, ratings by participants, and the ratings by external raters.

Chapter 9 discusses the findings of the theoretical and empirical research conducted. At first, the implications of Synergetics and competence research for the concept of self-organization and the construct systems competence are discussed which results in the reorganization of the construct itself. Subsequently, the results and implications of the three evaluation instruments are discussed. Lastly, the future work consequent from this thesis is presented.

1.4 Classification of Thesis

The work presented in this thesis follows an interdisciplinary approach by taking a construct developed in clinical psychology and transferring it to educational science. The covered issues allude to clinical psychology since the construct systems competence originated in the context of psychotherapy and in the education of psychotherapist (cf. (Kade et al., 2003), (Schiepek, 1999b)). Competence assessment and competence development have been receiving a lot of attention ever since 1992, especially in working environments, which is well documented by the comprehensive research programs of ABWF[1], see also (Erpenbeck & Sauer, 2001). These programs reflects the importance competences have received in adult education (Schiersmann, 2007). Also in educational psychology, competences have become important in the scientific discussion and in teaching. For example, they are mentioned in the training curricula of teachers (Komorek, 2006), or considered important for the use in school for teaching very specific competences, like writing competence (Becker-Mrotzek & Böttcher, 2006), mathematical competences (Brandt, 2006), or even social competences (Roth, 2006).

As this short excursus shows that competence concepts are adopted in several research disciplines. This thesis transfers a theoretical-founded concept into hands-on measurement instruments for competence development in adult education classes. As the training for systems competence and the respective evaluation takes place in counseling trainings, counseling studies is the appropriate field of research for this thesis which gives suggestions how to set up counseling trainings and capture a competence gain in such a setting.

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[1]http://www.abwf.de/

Part I

Scientific Background

Chapter 2

Synergetics and Systems Competence

This chapter introduces the theoretical framework of Synergetics and the construct systems competence which is the core of this thesis. The construct has originated as an collection of learning targets which bring together abilities and skills useful when working with complex social systems. To date it has evolved into an elaborate compilation of competences for this purpose. Systems competence integrates existing cognitive, emotional, and methodological competences rather than defining competences completely new. It was developed as a logical consequence of supporting change processes from the viewpoint of the theory of Synergetics, which views the forming and changing of structures and patterns in complex, dynamic systems. The self-organized nature of pattern formation - the core of Synergetics - leaves little opportunity for influencing systems targetedly. Taking into consideration the eight Generic Principles a framework is created in which self-organizing developments can take place. There are two elaborations of the construct: one for the area of psychotherapy and one for the area of organizational development. This thesis focuses on three aspects: Synergetic Knowledge, Idiographic System Modeling, and Generic Principles.

This chapter gives the background knowledge upon which the empirical part of this thesis is built upon. First, an introduction into the theory of Synergetics, its basic concepts, assumptions, and models is given. Empirical evidences are described, once for the area of physics in which Synergetics was developed and second for the area of psychology. The consequences for the supporting change processes from a Synergetic point of view lead to the description of systems competence. In detail, two aspects are characterized: the Generic Principles and the method of Idiographic System Modeling. Finally, evaluation approaches are presented.

2.1 Synergetics

Synergetics is a structural theory of spatio-temporal patterns in complex, dynamic systems. It focuses on the question, of how elements within a system co-act showing self-organized behav-

ior and resulting in specific patterns on a macroscopic level (Haken, 1987, p. 36). This can either mean the transition from microscopic chaos to macroscopic order (Haken, 1989, p. 68) or the transition from one macroscopic order to a different macroscopic order. Synergetics describes and analyzes the basic principles of this self-organized formation of orders aiming to define universal tenets of order formation independent of the nature of the system's elements. It follows a macroscopic, qualitative approach (Haken, 1992, p. 32) by describing and explaining the qualitative change of a system's macroscopical behavioral pattern. An order transition takes place when control parameters are changed (Haken, 2004, p. 71) which are internal or external conditions keeping up a certain order. The pivotal question of Synergetics regarding the adaptation to the area of psycho-social changing processes is to identify and modify the control parameters which are relevant for a system's orientation.

Synergetics was originated in physics by Hermann Haken in 1969 with an innovative approach of explaining laser light. Synergetics describes the laser as the result of the interaction of single elements which was a new theoretical explanation and supported with detailed mathematical algorithms. This innovative approach was well received in physics, and by today, it has diffused into many other research disciplines which view complex systems, such as chemistry, biology, economy, sociology, electrical engineering, and psychology (Haken, 1988a, p. 163). In psychology, it has proved valuable in clinical, perceptional, cognition, group, and organizational psychology (Strunk & Schiepek, 2006, p. 80) although it has received the greatest attention in regards to clinical questions (cf. (Haken & Schiepek, 2006)). Given the highly diverse nature of the research areas mentioned and the multitude of viewed systems in these areas, the search for universal principles of structuring may seem absurd. Nevertheless, Synergetics is not a particular physical theory. It rather sets the conceptual framework for viewing scientific problems from a systemic point of view (Schiepek, 1999b, p. 281). This endeavor succeeds based on the mathematical foundation of Synergetics (Haken, 1992, p. 33) and taking into consideration the domain-specific limitations and methodologies of each research discipline (Haken, 1996, p. 587), (Haken & Schiepek, 2006, p. 633).

The basic idea of the theory of Synergetics is the self-organization of systems and their elements. It means the spontaneous creation or change of spatio-temporal or meaningful patterns without external influence (Schiepek & Kröger, 2000, p. 242). The characteristics and structures of a system emerge through dynamic dependency between the elements that form a network with numerous interactions. Self-organization, thus, refers to such phenomena which emerge in systems as a result of the interactions of their elements (Heiden, 1992, p. 72).

This process of spontaneous self-ordering requires certain prerequisites (Schiepek & Kröger, 2000, p. 242), without which self-organization is not possible:

- high interaction rate of system elements
- non-linearity of those interactions
- being dissipative, that is, import and flow-rate of energy, information, and matter

These prerequisites allow systems to create macroscopic structures out of microscopic disor-

der or to change from one macroscopic structure to another. In human beings or social systems these prerequisites can be taken for granted (Schiepek, Wegener, Wittig, & Harnischmacher, 1998, pp. 16-19). This permits to view the human being from a Synergetic perspective.

The basic approach of Synergetics differs from the approach of other sciences. Traditionally, and often successfully, the object of investigation is parted into small pieces trying to understand their functionality. The advantage of this procedure is simultaneously its disadvantage: a microscopic inspection provides knowledge about the single components but does not contribute to the understanding of the macroscopic structure or pattern. Synergetics does not ask how structures are composed, it asks how they arise (Böse & Schiepek, 2000, p. 182).

2.1.1 Basic Concepts

Synergetics provides the theoretical framework and the mathematical foundation for describing the concepts of states of order and order transitions in complex, dynamic systems. In the following the basic concepts are presented before describing the base model of Synergetics. The base model integrates the basic concepts and depicts the creation of orders (see section 2.1.2). The mathematical modeling is not presented since it is of little interest for the core of this thesis (the interested reader may consult (Haken, 1983), (Haken, 1984), (Haken & Koepchen, 1990)).

System

In spite of the numerous definitions of system (cf. (Schiepek, 1999a)) there are two characteristics that dominate all definitions: First, a system consists of single elements which form a self-contained unit with a well-defined border in separation to the environment. Second, the elements have to be interconnected in order to interact with each other (Strunk & Schiepek, 2006, p. 5). This definition neither determines the type of elements nor the type of their interactions. Also, the definition allows the possibility of systems being phenomena of tangible nature (e.g. work team, cell structures) or of abstract nature (e.g. language, mental disorders). To determine which elements are part of a system the criterion of operative completeness can be applied. All elements that are involved in creating a phenomenon are part of the system as long as they are dynamically related to each other (Schiepek & Kaimer, 1988, p. 249). If interchanging elements does not change the system's character it can not be described as a system (Vester, 1999c, p. 27). The operative completeness forms an entity which separates the system and its elements from the environment by a shared border. In this sense the system is operatively closed. Systems as they are considered in psychology are open with respect to the exchange of sensoric, energetic, and thermodynamic information. They are kept in a balanced state by a constant input and output of energy, material, and information (Haken & Schiepek, 2006, p. 77). Thus, the systems in psycho-social contexts are operatively closed but yet open and in exchange with the environment. A human being shows distinctive cognitive, emotional, and behavioral patterns but is dependent on the input of energy or the output of expulsions. A system consists of several elements which can be treated as subsystem. Zooming in on those subsystems reveals systemic

structures of interrelated elements which again may be considered as separate subsystems (Kriz, 2000, p.20). This results in hierarchically nested system structures of multifaceted dependencies (Schiepek et al., 1998, p. 10).

Complexity

Complexity is defined as a number of interrelated units of which the degree and type of their relationship is insufficiently known[1]. To systems this applies in three aspects: first, the high number and multiplicity of system elements, second, the character of their interrelations, and third, the dynamics of the system's behavior (Schiepek et al., 1998, p. 10). Synergetics views systems consisting of many elements as it is one prerequisite for the self-organization of systems, as well as dissipativity and nonlinearity of systems (Schiepek et al., 1998, p. 18). Systemic approaches especially, put a focus on exploring relevant elements and their interrelations and making them explicit. The method of Idiographic System Modeling is one way to do this (cf. 2.2.3). Dörner impressively showed the difficulties of human beings managing complex problems. In complex, intransparent situations learned patterns of everyday life are applied that are inappropriate to the situation and therefore leading to disastrous results. A number of inadequate problem solving strategies are known: applying inadequate patterns of thought, neglecting dynamical aspects, trying to find one single variable, limitations of the cognitive system, and the desire of preserving one's competence perception (cf. (Dörner, 1996) and (Dörner, Kreuzer, Reither, & Stäudel, 1996)). A high degree of complexity complicates orientation. Thus, therapy and counseling can be understood as a process of complexity reduction. Unordered complexity of the system itself and inapprehensible complexity of the environment are transformed into a manageable degree of complexity (Bortz & Döring, 2003, p. 80). The full range of a system's cognitive, emotional, and behavioral patterns is not available at each point in time. Temporalization refers to the dynamic stability of system elements: Not all relevant elements are present at all times but are potentially retrievable. Thus, the counseling procedure needs to be compatible with clients' current states and adapt to their receptiveness for specific interventions (Bortz & Döring, 2003, p. 222).

Emergence

Emergence describes the characteristic of a complex system to show a coherent structure or pattern on a macroscopic level. This pattern is a new quality of the system, which can not be explained by considering the elements alone (Jacobshagen, 2000, p. 6),(Heiden, 1992, p. 58). The emerging pattern arises out of the multiplicity of interactions of the system's elements under the influence of control parameters (Böse & Schiepek, 2000, p. 44). What is considered as new depends on the perspective. Two aspects can be distinguished. First, the relation between a system element and a system: characteristics emerge in the system that are not inherent to the system elements. For example, the density variations within a gas can only be explained by

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[1]http://www.merriam-webster.com/dictionary/complex

describing the characteristics of a gas, which is a compound of molecules. Molecules themselves do not have density variations. Second, the relation between a system and its behavior: the surface of water can be either smooth or it can be deformed shaping a wave. Obviously, there is a qualitative difference between a wave and a smooth surface - an emergent characteristic. The difference can be observed and described by a number of characteristics like wave length, wave height, spreading velocity etc. Human perception has categorized the different qualities, that can be named and categorized (Haken & Schiepek, 2006, p. 79).

The concept of emergence serves the purpose of complexity reduction. Neither the characteristics or behavior of single elements are described nor single relations between system elements are examined but the entirety of the interactions of all the relations which create a unique pattern on a higher level (Böse & Schiepek, 2000, p. 44).

Control Parameters

Control Parameters are influences onto a system and can be treated as variables that can take many different values. For physical systems there are only external, environmental control parameters, whereas for humans, relevant control parameters also can be set internally (Haken & Schiepek, 2006, p. 60). Changing the control parameter at critical values leads to sudden qualitative changes in the system's behavior. Thus, a changed control parameter evokes a new order in the system (Haken & Koepchen, 1990, p. 24). The critical values at which the order changes are set within the system. Changing the control parameter in a critical area destabilizes the system, offering the possibility for re-stabilizing in a different order and showing a new macroscopic pattern. Changing the control parameter only leads to a new macroscopic pattern in an area around the critical value. Changing the control parameter remotely from the critical value there is a constant adaptation of the system to the varying environmental settings. Thus, no change in the system's behavior can be observed. Due to the temporalization of systems, different control parameters may be relevant for a system's behavior at a certain point in time. Also, the critical value depends on system-internal settings at a certain point of time. E.g. for schizophrenia, a set of control parameters whose characteristics determine the order (mental state) has been suggested by Schiepek and Schoppek (Schiepek & Schoppek, 1991).

Order Parameters

An order parameter is a dominant, macroscopic pattern (Strunk & Schiepek, 2006, p. 80) and serves as a description for a prevailing configuration within a system. The order parameter configures the system elements according to its order. Thus, it reduces the degrees of freedom of the system elements and therefore their variability. Since order parameters can be described as a single variable (Haken, 1992, p. 36) it reduces the complexity by substituting numerous description measures for each element by only one. When a system becomes instable several possible behavioral patterns (modes) can form and compete with each other, which usually results in one prevailing pattern. This winning mode becomes an order parameter and dominates the system's

configuration by suppressing other modes (Strunk & Schiepek, 2006, p. 60). Orders - also called attractors (Grawe, 1999, p. 456) - are stable states (Casper, Rothenfluh, & Segal, 1992, p. 725). They can coexist or cooperate, alternating with other orders (Haken & Schiepek, 2006, p. 82). In specific situations, there is a chance that the interaction of order parameters results in deterministic chaos. But unlike in microscopic chaos where a high number of of individual actions take place in a highly uncorrelated manner, the deterministic chaos is described by a correlated dynamics of the system's elements (Haken & Koepchen, 1990, p. 24). Especially in a physical system there is a unidirectional influence from the control parameter onto the order of the system. But in cognitive processes there are also reciprocal actions between the attractor and the control parameter (e.g. persons suffering from phobias escaping from the phobic situation). This again influences the control parameter and may change it (Grawe, 1999, p. 483).

Enslaving Principle and Circular Causality

A system can only show behavior that is innate to its elements. The behavior of the elements is determined by one or more order parameters which reduce their degrees of freedom (enslaving principle). As a specific order parameter sets the configuration of the system elements, the elements stabilize the prevailing order within a system. This is especially important at critical values when several modes compete with each other: elements can only show the kind of behavior that is possible with a specific order parameter. They are consensualized along the order parameter's logic (Haken & Schiepek, 2006, p. 82). On the macroscopical level this consensualization emerges as a coherent pattern. The system elements create the order parameter by showing collective behavior created by consensualization (emergence). Circular causality describes the influence of an order parameter onto the system elements which again retroacts onto the order parameter. The macroscopic behavior of a system can be described by a few dimensions due to he limited number of orders. This reduction of dimensions is an enormous information compression (Haken, 1996, p. 588). This is demonstrated with an example: learning a language (mother tongue) enables a child to interact with its social environment. Thus, the language enslaves newborns. Out of the multitude of possibilities to generate sound and apply grammar a specific set for one language is learned. As an adult the language is carried on and distributed again. Order parameter and system elements are subject to mutual causality. Without the individuals the language of a nation (order) can not exist; on the other hand language enslaves the individuals (Haken, 1987, p. 41).

Systemic thinking requires an enhanced understanding of causality. The common understanding of causality implies that the same cause always has the same effect which would comply with an "absolute causality". But since there are never exactly the same initial positions it is not possible to create the same effect. Now, the principle of "strong causality" claims that similar causes have similar effects. The behavior of complex systems shows that even microscopically small differences in the initial positions cause very different effects. "Weak causality" depicts that similar initial positions have different effects (divergence) and different initial positions have similar effects (convergence) (Strunk & Schiepek, 2006, pp. 110-112). Circular causality breaks the tra-
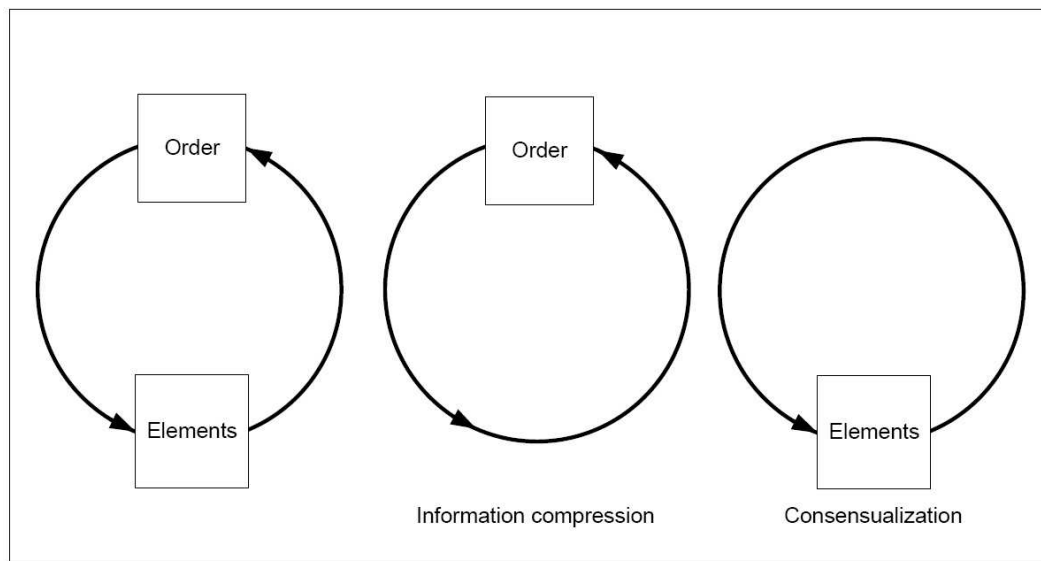
Figure 2.1: Circular Causality
The principle of circular causality, including information compression and consensualization.
Analog to (Haken & Schiepek, 2006, p. 83).

ditional understanding of strong causality: Similar causes do not have similar effects any more
(Schiepek, 1996, p. 356).

Instability

Changing the control parameter brings a system to a point at which it becomes instable. The
prevailing order parameter has to compete with arising modes. Critical fluctuations occur and
coincidences in those fluctuations decide which order parameter emerges next. The system is at
the brink of changing its macroscopic pattern to a different one (Haken, 1996, p. 588). The closer
a system comes to the point of instability the higher the variability in the system's behavioral
patterns will be. A further indicator for an instable pattern (attractor) is the time it takes for
the attractor to return to its original state. An instable system can test several possible new
states. A system in a stable state returns faster to its original configuration than at an instable
state (Grawe, 1999, p. 459). The instability lets several order parameters compete with each
other before the change of the parameter allows one order parameter to become dominant and
enslave the system elements into its mode. At this point, the system resides in an equilibrium
- a symmetric state. The degrees of freedom increase and the extent of enslaving diminishes
when the system approaches a critical point of instability. The fluctuations increase and they
are amplified by internal feedback loops until the system tilts into a new order (Grawe, 1999,
p. 459) - the symmetry breaks. In a change process, the points of instability are of particular

interest.

Time Scales

The three major constituents in Synergetics control parameter, order parameter, and system elements have different response times with respect to changes. Control parameters react slower to influences than order parameters, which again react slower than the consensualized system elements (Haken, 1996, p. 589). Haken demonstrates this with the following example: compared to the life span of an individual (control parameter), language (order parameters) changes slowly. A newborn (system element) is captured by the language (Haken, 1987, p. 41).

Phase Transitions

Therapy or counseling processes can be described as the supported transition from one undesired state into a desired state. For a transition the system's internal configuration needs to change which is achieved by altering the relevant control parameter. Due to the complexity of the human being and the lack of knowledge about relevant parameters, defining and changing an individual's control parameter is difficult. For manipulation, the external control parameters are usually not known or they lie within the system itself. Therefore, transitions happen without targeted manipulation. In opposition to the order-order-transition between two ordered states or a succession of states there are disorder-order-transitions which describe the transition from a microscopically chaotic state to an ordered state (Haken & Schiepek, 2006, p. 135). Ideally, a human or a social system possesses a wide range of cognitive, emotional, and behavioral patterns to adapt variably to internal or external requirements. Adapting to changing contexts is by no means pathological, it can be considered functional and beneficial for development (Flatten, Schiepek, Hansch, Perlitz, & Petzold, 2003, p. 32).

2.1.2 Base Model of Synergetics

The basic concepts of Synergetics can be integrated into the base model of Synergetics (see figure 2.2). This describes the interaction and dependencies between the concepts presented above: A complex system existing of a high number of elements and a high degree of interrelations shows a coherent pattern - an order - under the influence of a control parameter. The control parameter serves as an environmental variable that enables the system to configure its elements in a specific way. Before one order parameter becomes dominant and emerges as a coherent pattern the system passes through a competition of several possible orders (modes). In this state, the system is at equilibrium. There is symmetry between the states which are equally likely to be realized. Critical, accidental fluctuations break the symmetry and one order prevails. This order parameter consensualizes the system elements (enslaving principle) and reduces the degrees of freedom of the system elements. If the elements were able to behave in several different ways before, now their behavior is limited to the patterns the order parameters allow. Since the

elements again are only able to show a certain kind of behavior they determine the characteristic of the order parameter whose macroscopic structure emerges out of the system elements. This results in a circular causality chain: The order parameter is a function of the elements, and the elements' behavior is a function of the order.
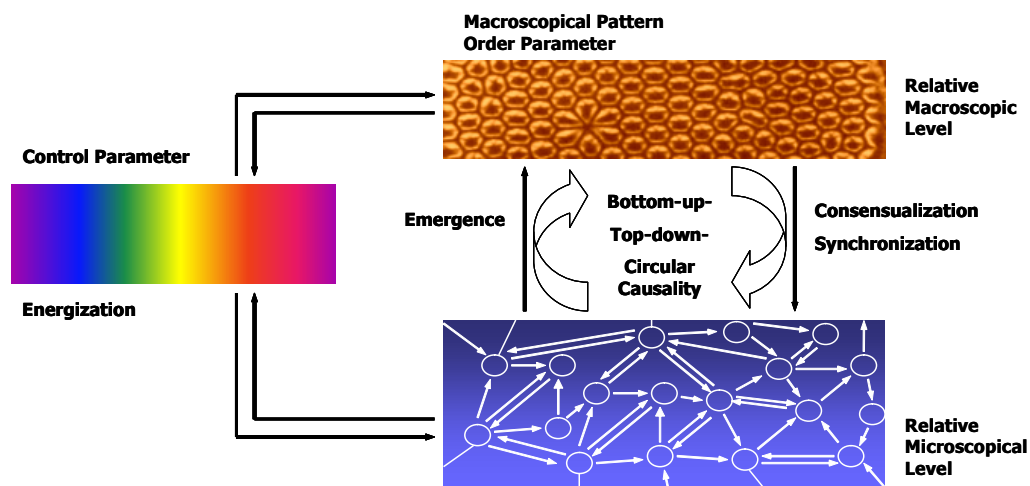
Figure 2.2: Base Model of Synergetics
Courtesy of Günter Schiepek.

A stable pattern emerges as the result of a self-organizing process. To move on from this stable state to another state the control parameter needs to change. Changing the control parameter causes the system's patterns to change at a critical point whereas this critical point is inherent to the system. Up to this point, the system intercepts the changes and maintains the order. Coming closer to the point of instability the degrees of freedom increase and the degree of enslaving diminishes. The fluctuations increase and are being amplified by internal feedback loops until the system tilts into a new order. Thus, a modification of the control parameter does not lead to the system's collapse in most cases, but the system passes from one order to another order. Close to points of instability it is easier to amplify the occurring fluctuations and support the system to stabilize a new order. A system develops when a new order is established; it learns a new order which has not existed yet. The system stands in abeyance and the natural fluctuations of the system select a state which is considered pleasant. Positive feedback strengthens the selection. The system selects a state as an attractor that has not been defined before. The configuration of this state becomes a new attractor which can be triggered by a certain characteristic of a control parameter (Grawe, 1999, p. 484). The system memorizes this new attractor as an option in its behavioral patterns. Depending on the control parameters the system can now change into this order, since it was learned.

2.1.3 Empirical Evidence

The conceptual framework of Synergetics has been validated by empirical research in different research disciplines. In the following, empirical evidence is presented, first for the area of natural science, and second, for the psychological phenomena.

Empirical Evidence in Physics and Physiology

Synergetics was developed by Hermann Haken along the example of the laser in theoretical physics. Since this prominent example occurs throughout most every publication regarding Synergetics, it shall be presented. Furthermore, a second example from physics is given to depict the functioning of Synergetics in fluids. As a third example, the finger movement paradigm is described; an example of self-organization from physiology.

Laser Paradigm   The laser paradigm is the most prominent example for explaining the basic concepts of Synergetics and can be used to describe the mathematical background of the theory (Haken, 1983, chapter 8). It shows how the cooperation of elements can create very different phenomenal behavioral patterns with distinctive transitions between the different states:

   A gas laser is a filled glass cylinder containing a gas which consists of atoms or molecules. At one end of the cylinder there is a mirror attached facing a permeable mirror at the other end of the cylinder. This allows the light wave to exit the glass tube. The atoms (or molecules) act as the constitutes (system elements) of the system. The border of the system is given by the glass cylinder that separates the gas from the environment. The laser is an operatively open system since it constantly requires energy (electric current) and emits light waves (Haken, 1989, p. 67). But functionally, the laser is a closed system since it can produce the laser beam by the described elements alone. The complexity of the system is given due to the high number of involved elements and the different dynamic states the system can function in. Applying an electric current to the gas excites the individual atoms energetically. More precisely: an electron is brought up to an energetically higher orbit. Returning to its lower orbit the electron emits a light wave. While a normal lamp emits microscopically chaotic light waves which are entirely unordered, a laser emits an entirely ordered light wave. This ordered light wave is generated by mounting the mirrors and increasing the electric current considerably. The laser light can be explained by a high correlation of the motion of the electrons (Haken, 1992, p. 34). This works as follows: A light wave emitted by an electron hits an energetically exited electron of another electron. By this, energy is transfered from the electron to the light wave and the light wave is amplified. Hitting more and more excited electrons in this way leads to a light avalanche. Increasing the voltage on the gas cylinder creates a large number of different light waves. Each of these light waves competes with all other light waves for the energy stored in the excited electrons. The mirrors at the ends cause light waves in axial direction to remain longer in the cylinder before exiting than light waves running angular to the cylinder axis (Haken, 1988a, p. 164). Eventually, one specific light wave wins the competition. This is called the order

parameter since it brings all other atoms into the same order thru enslaving. The single atoms again enable the order parameter by only emitting one specific light wave. This is the principle of circular causality. By increasing the electric current - which serves in this system as a control parameter - a new phenomenon emerges: at a certain point the coherent light wave is replaced by regular short light flashes (Haken, 1992, p. 35). The system shows a pattern which can not be shown by the individual elements.
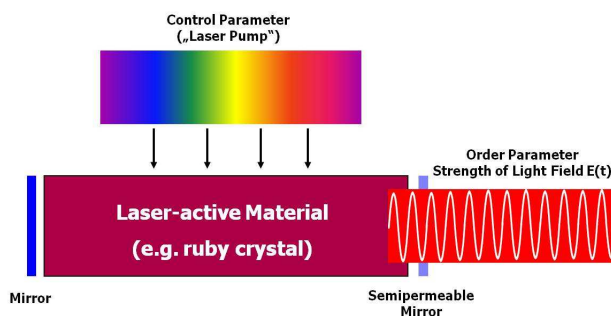
Figure 2.3: Set-up of a Laser
Courtesy of Günter Schiepek.

The system's individual elements are subject to self-organization, the order is not imposed from outside (Haken, 1988a, p. 165). Altering the control parameter leads to the process of self-ordering. The high number of individual behaviors (different wave lengths) is reduced to one single variable: the order parameter. The degrees of freedom are drastically reduced.

Fluid Dynamics Paradigm   The same principles can be demonstrated in the area of fluids with the Bénard Instability. By heating a liquid (e.g. silicon oil) from below it changes from a formerly homogeneous fluid to showing ordered patterns like hexagons or rolls when a critical temperature difference between the lower and upper surface is reached. Heating up the fluid expands the volume and the elements become lighter. Thus, the elements at the bottom of the fluid want to rise where as the elements at the surface tend to sink downwards since they are colder and heavier. The fluid can resolve the temperature difference with various configurations. The emerging rolls can turn clockwise or counterclockwise. Seemingly negligible differences in the initial states of the fluid and coincidental changes decide the configuration (Haken, 1992, p. 38). In terms of Synergetics, different orders are possible when increasing the temperature (control parameter). At the point of critical instability the competition of the orders is decided upon by critical fluctuations (Haken & Schiepek, 2006, p. 74). One order wins over the competing orders. The establishing order enslaves all system elements which in return support the order of the system (circular causality). The system resides in a stable state as long as the control parameter remains unchanged. The fluid now shows a pattern which is not innate to the system elements and can only be explained by the interaction of the system elements (emergence). The

fluid can reach a new state (order-order-transition) when the control parameter is changed or a second control parameter is applied. In the case of using a round glass envelope and applying temperature at the wall of the container, the structure emerges from rolls to hexagons (honeycomb structure). For the mathematical modeling see (Bergé, 1984).

Finger Movement Paradigm　　The concepts developed with the laser paradigm also have been transfered into the area of physiology. This was conducted by studying finger coordination movements as Haken reports in several places ((Haken & Schiepek, 2006, pp. 155-158), (Haken, 1992, pp. 39-41)). For the experiments of the finger movement paradigm, Kelso asked subjects to move both index fingers slowly in parallel. An easy task to conduct but when the speed is increased there is a critical point at which the finger movement changes involuntarily to a new behavior: the movement becomes symmetric. The change of the macroscopic behavior happens at a specific frequency which is unique to each individual. The frequency serves as the control parameter. The relative phase between the fingers can be identified as the order parameter. At a certain value of the control parameter (speed) an order-order-transition happens whereas critical fluctuations play an important role (Haken, 1988b, p. 227). Kelso's work is important since the transfer of the Synergetic model onto the example of finger movements allows to phrase hypotheses which were experimentally tested and could be verified.

Empirical Evidence in Psychology

Synergetics as a structural theory of spatio-temporal patterns in complex, dynamic systems can be applied to psychological phenomena as well. The theory's concepts which may seem too technocratic for social contexts have to be translated into this context, proving that they can be applied adding a surplus over conventional explanations.

The following section gives two examples: both are located in the area of clinical psychology. First, the Synergetic view on posttraumatic stress disorder is described and second, the Aachener Psychotherapiestudie is presented.

Posttraumatic Stress Disorder and Synergetics　　The understanding of posttraumatic stress disorder (PTSD) has been undergoing the influence of social frameworks during the last twenty years. Synergetics now is able to stimulate the discussion on a psychodynamic, neurophysiological, and system-specific basis leaving behind therapeutic schools. This section shows the applicability of the Synergetic perspective within the current understanding of posttraumatic stress disorder (ICD-10: F43.1; DSM-IV-TR: 309.81) (Schiepek & Schoppek, 1991).

With respect to mental disorders, the result of a self-organizing process does not mean that the the "self-organizing mechanism" is malfunctioning. Clinically relevant conditions - mental disorders - can be understood as a coherent pattern of a bio-psycho-social system which emerges in a self-organized manner. But the system stabilizes at an undesirable state with respective cognitive, emotional, and behavioral patterns (Grawe, 1999, p. 502). For therapeutic purposes

it is important to understand the accompanying processes to create the framework to allow self-organization (Flatten et al., 2003, p. 32). Memory loss is one characteristic of PTSD. The affected cerebric regions and involved neuronal networks can be identified by PET (positron emission tomography) or fMRT (functional magnetic resonance tomography). The resulting images of these methods are the visual representation of the neuronal activation pattern; a state that stabilized by repeated activation. The term attractor is useful to describe this stability. Triggered by internal and external stimuli the brain activates patterns which stabilized due to the repeated activation. Whereas sound mental functioning is characterized by easy transitions from one state (attractor) to another, traumatic attractors are characterized by a tendency to stabilize themselves. The activation takes place in an uncontrolled manner and reactive to trigger stimuli. Strategies and experiences to control the cognitive, emotional, and behavioral patterns are de-validated, and there is a tendency to further generalization (Flatten et al., 2003, p. 34). The hyperarousal occurring with PTSD can be described as a shift of psycho-endocrinal stability relations which alters the probability of appearance and transition of hyperarousal. Counterparts to the psychological phenomena can be found in neuro-endocrinal systems (Flatten et al., 2003, p. 34).

PTSD - similar to other mental disorders - is characterized as a state of pathological stability, which consensualized manifold mental processes in sensation and perception. Also, it inhibits the flexible adaptation to the changing situations of everyday life (Haken & Schiepek, 2006, p. 42). For the therapy of PTSD, strategies have to be developed to destabilize those rigid vegetative reaction patterns and readjust mental and psycho-physiological reagibility.

Process-Outcome Studies   One of the most elaborate examples for applying Synergetics to psychological phenomena is the Aachener Psychotherapiestudie, an process-outcome study conducted from 1998 to 2000. The process-outcome study sets into relation the self-dynamics of a psychotherapeutic process with the outcome of the overall treatment. A total of 94 cases are recorded in the study. The average duration of stay is at 66 days, with a minimum of 28 days and a maximum of 112 days. The process of the psychotherapy is captured with TPB (Therapieprozess-Bogen), a questionnaire with seven dimensions and a total of 53 items covering the perception of change and relations to others, and affectivity measures (for a detailed discussion of TPB, see (Haken & Schiepek, 2006, p. 363-376). Daily ratings taken with PTB result in time series that are analyzed with several methods. The time series is compared with 6 different outcome measures.

Synergetics predicts order transitions with accompanying critical fluctuations (Schiepek, Eckert, Honermann, & Weihrauch, 2001, p.104). The critical fluctuations are captured by measuring the intensity of the fluctuations of each time series deriving a series of measurements ranging between 0 and 1. To determine when a fluctuation becomes critical dynamic confidence intervals can be calculated. This is important if the fluctuation intensity is to be assessed during the process and not alone at the end. For this purpose, a window with a given time frame is given, in which the confidence interval is determined. This has the advantage of a higher sensitivity to

the respective time series. The maxima of patients with a low fluctuation intensity still can be identified.

As it would be complex to view each item's series and the occurring fluctuations, the complexity resonance diagram shows significant fluctuations for each item at each measuring time (in this case daily). In a coordinate system time is plotted against the x-axis and the items of TPB are plotted against the y-axis whereas the quantitative series are transformed into a binary visualization: those values which exceed the threshold of $p<5$ % are marked with a grey box and the ones exceeding $p<1$ % are marked with a black box. A bar chart above the coordinate systems shows the sum of significant fluctuations (see figure 2.4 on page 29). This procedure results in a visual depiction of phases with many significant fluctations and phases with little fluctuation. This way of visualization shows that critical fluctuations concentrate at certain points in time. At other moments the distribution of significant critical fluctuations seems random. The concentration of critical fluctations correlates with incisive experiences during the therapy reported by the patients (Haken & Schiepek, 2006, p. 391). These order transitions happen in all therapies more or less clearly (Schiepek & Kröger, 2000, p. 248). The point in time is not predictable and with a high inter-individual variance.

With patterns of dynamical synchronization it can be shown that self-organization happens also on the level of subsystems which shows that order parameters take effect at certain points in time and may also only effect specific substructures. Calculating the correlation between all variables and presenting them color-coded in a coordinate system (green shading for positive correlations, red shading for negative correlation) gives an overview of the changing resonance between subsystems over time. The color-coding becomes necessary since there are 1378 correlations per time slot if all 53 items of the TPB are considered. The colors present a macroscopical pattern. Its change is visualized when an indicator is moved over the time bar. This procedure shows quite clearly how subsystems - determined by the factors of the TPB - set in resonance with each other at certain points in time. (Haken & Schiepek, 2006, pp. 408-410).

The findings of the Aachener Psychotherapiestudie show that therapy can be described as cascades of order transitions that are associated with critical fluctuations. Synergetics provides a number of methods to identify and describe the order transitions mathematically. The comparison between the results of the therapy process and the outcome measures shows that successful therapies come along with critical fluctuations (Haken & Schiepek, 2006, p. 420). Therefore, therapy has to be laid out in a way to allow order transitions and critical fluctuations like the Generic Principles describe it (see page 42).

2.1.4 Consequences

Self-organizing systems have a strong resistance against giving up their stable state and changing to a different state. Due to their self-organizing nature a targeted manipulation is only possible when a relevant control parameter is found and changed to a point at which the system passes through a phase of instability into a different stable state. In physics, in which experiments can be run over and over, control parameters can be identified. With human beings this is not so
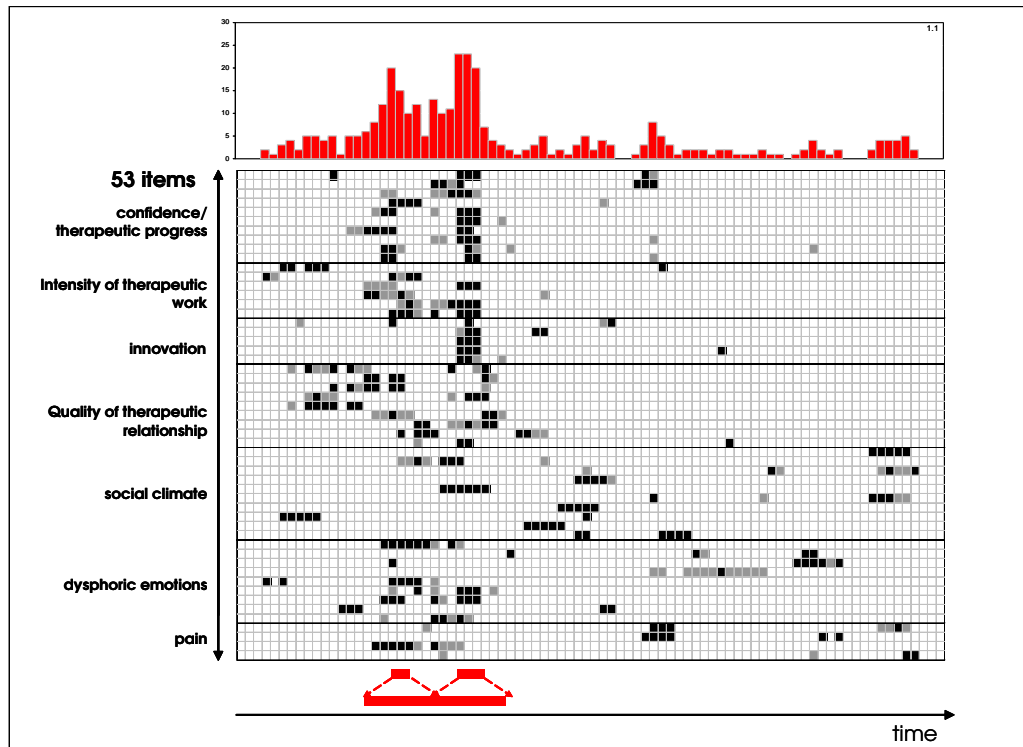
Figure 2.4: Complexity Resonance Diagram
Courtesy of Günter Schiepek.

easy. Although there are suggestions to what may serve as a control parameter in humans, the description of relevant control parameters remains very difficult.

Self-organized processes can not be influenced directly but yet conditions can be established to initiate, enhance, and support a change process. They are called Generic Principles. Next to those conditions, competences can be described which are necessary to manage complex, dynamic systems. These competences are listed in the construct systems competence. Although the construct systems competence only lists the Generic Principles as one of six dimensions, they make the core of the construct. The other dimensions list the necessary mindsets, techniques, methods, and knowledge to be able to put the Generic Principles into action. The Generic Principles provide a guideline for counselors. They are part of the construct systems competence (dimension 4). The eight principles do not follow a normative phase model of human development but list criteria which are always important in a change process, but with different levels of importance at different stages of the process.

The construct systems competence is presented in detail in the next section. Also, the Generic Principles and the method Idiographic System Modeling is described.

2.2 Systems Competence

Dealing with complex systems is characterized by intransparency, self-dynamics, and ambiguity (Gussone & Schiepek, 2000, p. 95). Due to their complexity, the determinants and interrelations of systems often are unsatisfactorily known which impedes their manipulation (Dörner, Schaub, & Strohschneider, 1999, p. 199). The lacking transparency of the processes and the resulting missing descriptiveness challenges a person's abilities to face such situations mentally and physically (Kriz, 2000, p. 10). To cope with the evolving stress and to provide ways and means to deal with complex dynamic systems the construct systems competence was developed (e.g. (Schiepek, 1999a, 1991; Gussone & Schiepek, 2000; Haken & Schiepek, 2006)).

The construct comprises criteria for managing complex systems. For this purpose, existing described abilities, skills, relevant knowledge, and competences are integrated into one concept. It is considered a collection to describe the systems competence of individuals as well as of social systems (Manteufel & Schiepek, 1995, p. 341-342). They are listed in six dimensions that are not exclusive categories in the sense of statistically independent factors. The construct is meant to be a competence model which reflects the essential emotional and cognitive, scientific and practical competences necessary for the professional work with complex system. It also serves as a collection of learning targets for further education and training with a Synergetic focus.

The construct systems competence consists of the following six dimensions:

1. Social Competences
2. Dimension Time
3. Emotions, Coping with Stress, Mobilization of Resources
4. Developing Conditions for Self-Organization
5. Knowledge
6. Pattern Recognition and Pattern Modeling

Up to 2006, the construct has been adapted to two application scenarios. There is one version for the area of psychotherapy and one version for the area of management and organizational development (Haken & Schiepek, 2006, pp. 671-673, p. 635). It needs to be remarked that the only substantial change between both specifications lies in the knowledge dimension which specifies the knowledge aspects for both areas. The overall orientation is the same for both versions. The construct's content is structured according to principles of systems science, providing a consistent theoretical background (Schiepek, 1997a, p. 199).

The construct was developed as a criteria list to structure the debriefing of the System Role Play (SRP). In German, this role play method is known as Systemspiel (see page 47). Up to the newest version, it has developed into a collection of learning targets for the education in

Synergetic Process Management (Haken & Schiepek, 2006, p. 671). Although originally constructed in the area of psychotherapy it does not contain specific therapeutic techniques. The systemic view on the competences needed in counseling and therapy is described on a more abstract level than merely enumerating techniques. Despite having elements of systemic solution-oriented therapy, it does not solely propagate systemic therapy and counseling. The mentioned competences can be implemented by different techniques of different therapeutic schools. This emphasizes the orientation of the construct independent of therapy schools (Schiepek, 1997a, p. 200).

The term systems competence - as well as its German equivalent *Systemkompetenz* - shows the ambiguity of the term: it refers to the competence of a system (e.g. competence, abilities, skills of a counselor or a team) but it also refers to the competence in working with a system (e.g. an individual working with a client or team) (Gussone & Schiepek, 2000, p. 100).

Systems competence appears in two different modes: emergent systems competence and individual systems competence. Emergent systems competence occurs in social systems when new qualities emerge due to the unique composition and constellation of the social system like in a team or a division (Haken & Schiepek, 2006, p. 636). Emergence refers to the evolving characteristics of a system composed of different individuals which can be observed as a coherent, holistic phenomenon. Individual systems competence refers to the competence set of a single individual. On a vertical dimension different integration levels can be distinguished: individual, team, division, organization, community etc. (Schiepek, 1997a, p. 203). Every member contributes different aspects and competences and by the interaction within the group new qualities of the system emerge. This procedure of combining elements and emerging new features repeats on a higher hierarchical level (department, institution) (Böse & Schiepek, 2000, p. 188), compare table 2.1. Additionally to the differentiation on the vertical dimension, acting out systems competence can refer to two kinds of objects: either it refers to the own system (referring to oneself) or to a different system (referring to others). The self-referential exertion of systems competence aims to use all available competences to ensure the own functioning and operating, enhancing performance and satisfaction as well. In counseling or psychotherapy this is a crucial aspect, since therapist are being confronted with clients with psychic disorders and problems every day. The daily high impact of mostly negative emotions received by a counselor must not be underestimated (Reimer, 2005, pp. 664-665). Systems competence applied to oneself helps to maintain mental health and protects from burnout (Gussone & Schiepek, 2000, p. 95). By applying systems competence referring to others, a system provides guidance and support for a different system's self-organization and development on a comparable integration level (Schiepek, 1997b, p. 66). For example, a team in a change management department provides services to other divisions of the organization (team building, project management etc.). The more the individuals of the groups are interested in integrating different knowledge and perspectives into their own methodological competences the more they can be acted out as an individual and as a group as well (Martens & Nachtigall, 2006, pp. 126-127).

Kriz and Gust have a slightly different understanding of the construct systems competence: to them it is composited of an general, comprehensive part and a specific part. The specific part

Table 2.1: Emergent competence in systems

	Referring to oneself	**Referring to others**
Level 1 (co-workers)		
Level 2 (e.g. work group, project group)		
Level 3 (e.g. department, institution)		

shall comprehend area-specific knowledge and actions to master specific situation-depending requirements. The comprehensive systems competence helps to manage diverse situations and consists of several competence areas. These competence areas are: problem-solving, reflection, social-communicative competence, personal emotional and motivational competences, and system developing competences (Kriz & Gust, 2003, pp. 12-14).

2.2.1 Development of Systems Competence

The construct systems competence is strongly application-oriented. This becomes apparent considering its development over the last fifteen years. First, a historical overview of the construct's development is given focusing on the context the construct originated in. After this, the development of the dimensions is described.

Context

The construct starts out as a collection of criteria for assessing the management of complex systems with the goal to provide a guideline. The development of the construct is an answer to the typical mistakes when dealing with complex, unknown systems (cf. (Manteufel & Schiepek, 1995, p. 334), (Dörner et al., 1996)). The collection first is compiled from the reactions of SRP participants (System Role Play) by giving guidance for successful acting right from the beginning (Manteufel & Schiepek, 1993, p. 23). This first outline holds five dimensions (considering social structures, time, emotions, interpersonal skills, system-theoretic methods and knowledge). Right from the beginning, the construct is laid out in two conceptual layers: individual systems competence and general systems competence. This is later renamed into emergent systems competence. The dimensions consist of cognitive, emotional, and social-interactive competences as well as systemtheoretic knowledge - a mix of competences which shall remain stable.

The construct is enlarged in 1994 (Manteufel & Schiepek, 1994), when a sixth dimension is generated by splitting the last dimension (systemtheoretic knowledge) into two: developing conditions for self-organization and system-theoretic methods and knowledge. From this point on the number of dimensions remains constant. Systems competence is described as a recursively networked system of different competences rather than a construct of individual behavioral aspects. Being a dynamic construct not all parts (variables) are important at the same time. Different states of order in the counseling system may require different parts of the construct (p.75).

Systems competence serves as a guideline used in the debriefing of the SRP (p.78) which again shows the construct's origins.

There is little substantial change in 1995 (Manteufel & Schiepek, 1995). The construct is enriched by the facet of "taking care of oneself" that is integrated into the emotional dimension. The SRP is considered as a valuable method for acquiring systems competence and this method is suggested to be integrated into education programs (Manteufel & Schiepek, 1995, p. 342). With a strong focus on the education of therapists - but no substantial change - the construct is presented in 1997 (Schiepek, 1997a), (Schiepek, 1997b). It is considered as a base characteristic of clinic professionalism.

In 1998, the construct is mentioned in a book covering System Role Play (SRP) (Manteufel & Schiepek, 1998). The six dimensions are enriched and detailed and set into relation of the SRP that is considered an ideal method to train and evaluate systems competence. The concept of individual and emergent systems competence is detailed with respect to the object of reference (referring to oneself vs. referring to others) (p. 201).

In 1999, the concept is mentioned in the context of the education of therapists and counselors (Schiepek, 1999a, pp. 417-422). Now, systems competence is described as a competence profile organized in six partly overlapping categories. The description takes up what is mentioned before (Schiepek, 1997b, p. 61). The demands placed on a counselor by the therapeutic process follows three basic principles: resource orientation, affect-logic, and leadership skills (p. 417-418).

In 2000, Kriz takes up the construct systems competence (Kriz, 2000). The author does not contribute to the further development of the construct but develops a training program for systems competence. For the author it comprises basic attitudes, knowledge, and skills of acting out systems science (p. 13). Kriz emphasizes that being competent in systems encloses treating one's own body and soul with care as well as the social, technical, and natural environment (p. 14). The author describes his own approach to teach competences in systems using gaming simulation ((Kriz, 2000a), (Kriz & Gust, 2003).

Also in 2000, it is presented as a means to face the challenges that come with working with social systems, like complexity, intransparent self-dynamics, and ambiguity. Thus, being competent in systems can prevent from the negative outcomes of those challenges and burn out (p. 95). Competence in systems is considered as the ability for orientation in complex social systems, and intervening with the systems dynamics targeted-oriented and active. To prevent burn-out, the last of the six dimensions is considered as the least useful. But the importance of a theoretical foundation is considered in order to view complex dynamic systems from a different perspective. The construct is considered to be very important for the mental hygiene for the work of psychologists and psychotherapists which should lead into the integration of competence in systems into training programs for this target group.

In 2006, the latest, most elaborate description of the construct is published (Haken & Schiepek, 2006, chapter 7.4.2 + 8.2.2). Systems competence is described as a construct comprising six dimensions which include all necessary emotional, intellectual, scientific, and hands-on aspects for working professionally with complex systems. The construct serves as a collection of learn-

ing targets which may be used for orientation to set up an accordant training program. The
dimensions I and IV are combined to the dimension "Social Competences". The knowledge
aspects of the last dimension are extracted and now form the separate dimension "Knowledge".
It also covers aspects of mental hygiene and salutogenesis for the counselor and it is thought
to serve as a competence model for leadership (p. 636). There are two domains for which the
construct is adapted: the area of psychotherapy (p. 671-673) and the area of management and
organizational development (p. 635). As a request, the authors ask for a stronger orientation
of training programs along the construct and the development of reliable and valid evaluation
methods for objectifying and enabling measurement (p. 674).

Dimensions

The first dimension regarding social structures and contexts retained its core meaning until 2006
when it is merged with the dimension interpersonal skills to become the new dimension "So-
cial Competences". The core of "Dimension Time" remains basically unmodified over time.
Only the temporal aspects of conducting a counseling interview are added. In 2006, the third
dimension integrates aspects of resource activation, and the dimension containing aspects of sys-
tem promotion and developing prerequisites for self-organization is renamed into "Developing
Conditions for Self-Organization". Since then it contains the Generic Principles. The dimen-
sion theoretical knowledge and system theoretical methods contain knowledge from different
areas. In 2000, this dimension was further enriched. In 2006, this dimension is split into two
dimensions: "Knowledge" and "Pattern Recognition and Pattern Modeling". The dimension
"Knowledge" contains the theoretical background knowledge necessary for working with com-
plex social systems. The content of this dimension depends partly on the the application domain
(currently for psychotherapy and organizational development). The dimension "Pattern Recog-
nition and Pattern Modeling" comprises various techniques and methods for data capturing, data
analysis, and data presentation.

   In 2006, the construct systems competence experienced the most major revision by restruc-
turing the contents and concentrating more on techniques and methods of pattern recognition
and pattern modeling than in the previous versions. Despite these changes the core meaning and
contents of the construct have not been substantially changed over the period of its existence.

2.2.2 Dimensions of Systems Competence

In the following the six dimensions of the construct systems competence are presented. Instead
of reproducing the list of competences the intention of each dimension is given. For the de-
tailed listing of the competences see the extensive description by Haken and Schiepek (Haken
& Schiepek, 2006).

Social Competences

The dimension "Social Competences" contains aspects of interpersonal communication and interaction. This comprises interactional aspects like acting sensitive to a particular context, working in teams and cooperation in / with teams, conflict management, as well as working in hierarchical settings. It also covers managerial skills as there are delegation and communicational skills like choosing context-sensitive wording, considering cultural aspects, and giving feedback. Also, this dimension contains abilities to develop an understanding of the operation mode of known and unknown systems as well as their formal and informal rules. Reflecting one's own emotional schemata and supporting the self-esteem of oneself or others are further competences listed.

Dimension Time

Systems develop specific dynamics which are difficult to predict. Due to this fact, counseling behavior is required to adjust to the intrasystem changes over time in order to stay in close resonance to the client. The competences listed in this dimension comprise the abilities to develop goals but knowing about the limited predictability of non-linear processes (Ossimitz, 2000, p. 55), (Schiepek, 1997a, p. 190). Knowing various phase and development models support orientation but should not be strictly exerted. Also, this dimension covers aspects of pacing and leading, and the ability to avoid pressure of time. Lastly, it contains Generic Principle 6 (cf. page 35) that covers dynamic aspects like synchronizing the counseling behavior to the clients' rhythm and detecting the sensitive moments for interventions (kairos) (Manteufel & Schiepek, 1995, p. 340).

Emotions, Coping with Stress, Mobilization of Resources

This dimension is comprised of a set of competences dealing with emotional aspects that occur in change processes, and it includes the competences to identify, develop, and activate the counselor's own resources, making use of support and social networks, and coping strategies to deal with the emotional strain occurring in counseling. This also covers the ability to deal with ambiguity in the counseling process. Becoming aware and making use of existing strengths and energies (empowerment, jiu-jitsu (Böse & Schiepek, 2000)) is especially important for the client but also holds true for the counselor. Lastly, this dimension comprehends the ability to evoke the clients' resources in order to create the necessary motivational state for change in the client's life.

Developing Conditions for Self-Organization

Considering a change process as a self-organizing process which eludes to direct intervention requires the description of conditions that allow self-organization. This dimension includes the Generic Principles which provide the framework for self-organized development processes.

Seven of eight principles are listed in this dimension: Creating Conditions of Stability, Identifying Patterns of the Relevant System, Sense-Making / Coherence, Identifying Control Parameters / Enabling Energization, Destabilization, Enabling Symmetry Breaking, and Re-Stabilization. Generic Principle 6 (Synchronization, Resonance, Kairos) is listed in dimension 2 since it covers dynamic aspects. The elaborate description of the Generic Principles can be found on page 42. Also, this dimension contains heuristic competences like information search, expending search space, forming analogies.

Knowledge

The dimension "Knowledge" lists knowledge areas that are important for counseling from the perspective of self-organization. What knowledge is relevant depends on the application area in which the counseling takes place. So far, there are two knowledge collections (Haken & Schiepek, 2006): for the area of psychotherapy and management and organizational development. Although the content of the knowledge collection is dependent on the area of application, there are domain-independent knowledge modules that recur in each domain since they provide the necessary knowledge for understanding the functioning of systems, e.g. basic knowledge about Synergetics and about the theory of complex non-linear systems. These modules apply to all application areas. Building upon these domain-spanning knowledge modules, for each application area specific knowledge modules are defined, which represent the important and indispensable knowledge constituents in this area. For example, for psychotherapy knowledge about psychotherapy research, mental disorders, clinical theories and models, psychoneuroimmunology, and neurobiology is listed. For management aspects covering management theories, organizational models, organizational development, and human resources are integrated. The construct systems competence summarizes the required competences for dealing with complex systems whereas the nature of the systems is not defined further, hence it is applicable to many different application areas. Only by definition of this dimension, the application area of the construct competence in system becomes explicit.

Pattern Recognition and Pattern Modeling

This dimension lists procedures for capturing, analyzing and visualizing dynamic patterns in interactional structures. Besides the standard methods of measuring and data capturing in psychology, there is an emphasis on procedures to identify mental states and interactional patterns of individuals (Idiographic System Modeling, States-of-Mind analysis, repertory grid etc.) and for describing case studies. This dimension also comprises methodological knowledge about developing questionnaires and interview guidelines is listed as well as using computer simulations. In addition, various descriptive measures and methods for analyzing process data are mentioned, e.g. Lyapunov exponents, recurrence plots, factor analysis. Also, conducting empirical research and capturing data in field research, clinical and organizational settings are listed in this dimension. Like dimensions 1 - 4, this dimension is thought to be application-independent but may

have to be adapted to the context they are applied in.

2.2.3 Some Aspects in Depth

The two following sections go into detail on two aspects of the construct systems competence. They play a central role in the training conducted in the empirical part of this thesis. Next to base knowledge the method Idiographic System Modeling of the dimension "Pattern Recognition and Pattern Modeling" and the Generic Principles of the dimension "Developing Conditions for Self-Organization" are operationalized and the gain of competence evaluated. Thus, both are presented in the following.

Idiographic System Modeling

The identification and representation of dynamic behavioral patterns requires thinking in system structures that means networks of mutually dependent elements. Modeling a system by bringing a mental process to consciousness facilitates systemic thinking (Ossimitz, 2000, p. 59). There are several methods that can be utilized to illustrate system dynamics and system structures. Manteufel and Schiepek (Manteufel & Schiepek, 1995) mention procedures like Plan Analysis and Sequential Plan Analysis, different sculpturing techniques, Willi's collusion concept, future workshops, and SRP. This list can be extended by the techniques of configuration analysis, gaming simulations, circular questions, and subjective reconstruction of systems' evolutionary pathways (Schiepek, 2003, p. 176-177). In counseling, modeling techniques can be applied as a trigger for communication. Although, there is no need for explicit modeling in every case they can be utilized to focus on the clients' requests and work on solution scenarios. Criteria can be applied to the models resulting from the different methods. A list of 20 criteria for assessing systemic models is recommended by Schiepek (Schiepek, 1991, pp. 47-50) and (Manteufel & Schiepek, 1995, p. 337).

Idiographic System Modeling is a method to create models which are to be understood as abstract recursive systems. The adjective "idiographic" points out that the model is defined for single cases. These elements are usually no material entities (trees, persons) but theoretical constructs (e.g. fear, satisfaction, self-concept) (Schiepek, 1991, p. 249). This method aims to represent system patterns in order to gain a better understanding of a single case. It depicts explanans and explanandum at the same time. Depending on the perspective toward the system model, explanans and explanandum may change (Fiegl & Reznicek, 2000, p. 236). For counseling, two things are important: First, they are used to develop alternate life drafts and to identify resources; and second, explicit modeling is not necessary. But it supports focusing on the clients' concerns and offers an occasion for communication between client and counselor (Manteufel & Schiepek, 1995, p. 337). The resulting network diagrams graphically represent relevant system elements and their interrelations. These diagrams provide a communicational basis about the viewed phenomenon, presenting an overview of complex contexts. They help to

identify relevant components or even substructures and their reciprocal dependency (Casper et al., 1992, p. 721). The elements and relations of the system model are not defined ex ante. With regards to content, the model is open for different levels of description and refinement. This is needed for the description of the heterogeneous determinants of mental processes. Due to this openness, Idiographic System Modeling is a meta strategy.

The method reveals mental processes and puts them into relation with external factors (Schiepek, 2003, p. 177). This results in a functional analysis of a system's bio-psycho-behavioral patterns in dependency on internal and external factors. Also, the shared life concepts of two or more persons can modeled with this method (Schiepek, 1991, p. 65). Since the Idiographic System Modeling is always conducted from a certain perspective and for a certain purpose there is a selection of elements and interrelations. This leads to complexity reduction by regarding only certain aspects represented in one model (Schiepek et al., 1998, p. 14). Instead of describing the functioning of each element the operation mode of a system as a whole can be described by one or a few order parameters (Vester, 1999b, p. 55).

The constituting system elements can stem from different physiological, psychological backgrounds and refer to different social system levels. Assumptions about the interrelation of two system elements produce a hypothesis about the nature of the interrelation. Expressed as causal statements (if...then) they become part of an overall recursive hypothesis network for the complete system (Schiepek, 1991, p. 76). Single causal statements have to be interconnected to form recursive feedback loops, in which activating and deactivating processes are in equilibrium (mixed feedback) (Schiepek et al., 1998, p. 15). The positive and negative feedback loops in a system model are necessary to explain stable states. Systems with negative feedback loops can recover from an irritation (Dörner, 1996, p. 512). With negative feedback, it can be explained why panic attacks come to an end at a certain point in time or other mental or interactional problems occur in phases. Systems with exclusively positive feedback (vicious circle) alone can not explain this dynamics (Schiepek & Kaimer, 1996, p. 276): they virtually explode. By visualizing the recursive network of a system a dynamic understanding of the system develops when passing through the system. Specific dynamical behavioral and emotional patterns emerge and so does their inherent temporal structure. Idiographic system models are complex with respect to their structure. The models contain a high number of elements of heterogeneous character and a high number of interrelations between the elements. Time is introduced as an important factor in these models. Following the feedback loops throughout the model creates a specific dynamical behavioral and emotional pattern. The non-linear relations between the system elements can explain sudden changes or qualitative order transitions of the system's behavior. These can be triggered by changes in the system's environment or small fluctuation within the system (Schiepek, 2003, p. 177).

Applying the method results in a visualization of elements and their reciprocal impacts describing a certain stage. Since the trigger for starting therapy or counseling is a perceived problem or unsatisfying phase of life, elements describing this problem are part of the identified system model. Besides the analysis of the actual problem, the model may contain resources, solutions, coping strategies, as well as alternatives to momentary thoughts, emotions, and behavior

(Schiepek & Kaimer, 1996, p. 279).

The method of Idiographic System Modeling holds five steps. The modeling procedure is distantly related to the steps of Vester's sensitivity model but focuses less on the impact factor of single elements (Vester, 1999b, pp. 160-171) or Ossimitz's procedure but less focused on quantitative modeling (Ossimitz, 2000, pp. 127-140). The schema of this method is presented in figure 2.5, the description of the methods is given in the following:
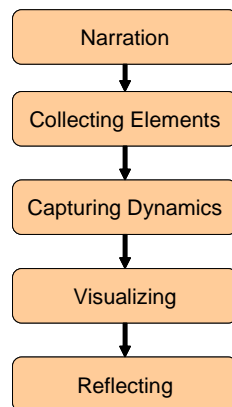
Figure 2.5: Schema of Idiographic System Modeling

1. Narration. The Idiographic System Modeling starts with a narrative interview about the client's concerns. It follows the principles of solution-oriented brief therapy (cf. (Shazer, 1985), (Kaimer, 1995), (Shazer, 1996), (Kaimer, 1999)) with a strong focus on questions that ask for impacts of elements on other elements. Helpful questions are e.g. hypothetical questions (Scheib & Wirsching, 2002, p. 160), what-else questions (Berg & Miller, 2000, p. 164), or resource-oriented questions (Berg, 1992, pp. 103-106). Schiepek lists a number of questions that enlight the functioning of a system based on cybernetic criteria (Schiepek, 1986, pp. 82-86). To develop such a network of statements it is suggested to start with an initial statement (problem statement, solution statement) that serves as a starting position for further developments (Ossimitz, 2000, p. 131).

2. Collecting Elements. The relevant elements are collected in a separate step before the visualization. In this step it is important to clarify the content and the meaning of the elements as well as conferring with the client about the labeling of the elements. Paraphrases (König & Volmer, 2005, p. 55) and summaries are helpful means to achieve this agreement between counselor and client.

3. Capturing Dynamics. The relations between the system elements do not describe the flow of material, energy, or information. In fact, they describe abstract covariations between the elements (Schiepek, 1986, p. 113). To exemplify the dynamics between the elements

over time, their run can be depicted in a coordinate system, with time plotted against the x-axis and the value of the elements plotted against the y-axis. The run over time shows the co-variation of elements, corresponding groups of elements or counter-trends of elements.

4. Visualizing. The elements identified in step 2 are put into relation in this step. The impact of one element onto another is marked with an arrow. To mark the tendency of the relation a plus (+) or a minus (-) is added to the arrow. This corresponds to the covariation between the two elements plus indicating the direction of cause. For each relation between two elements there is a separate arrow. In extensive models, the strength of the relations may be more precise (Ossimitz, 2000, p. 15) or even specific mathematical functions about the nature of the correlation are given (Schiepek, 1986, p. 153), although this extensive annotation may go beyond the scope of therapy or counseling. Positive and negative feedback loops can be marked (Vester, 1999b, p. 125) whereas negative feedback should exceed positive feedback in a system model to avoid the explosion of a system or to manifest vicious circles (Vester, 1999a, p. 20), (Vester, 1999b, pp. 128-130).

5. Reflecting. The system modeling is concluded by reviewing the developed model with respect to new insights, gained resources, raised awareness to behavioral or emotional patterns. Counselor and client agree on the next steps for further sessions.

Idiographic system modeling is a procedure that serves as a meta-strategy for creating a systemic reality model which is based on the systemic perspective and constructionism. It uses self-referential descriptions and serves as the possibility for self-organization (Schiepek & Kaimer, 1988, p. 257). An idiographic system model is formed of elements connected with relations of a certain direction. These relations between two elements make a first-order hypothesis of their correlation. More important is the second-order hypothesis which is constituted by the system model itself. The model represents a pattern of cognitive, behavioral, and emotional aspects that all interact and depend on each other. After all, it helps to understand the system's dynamics (Schiepek & Kaimer, 1988, p. 248). Due to the high degree of connectivity in the model the assumption of lineal causality can not be sustained. Lineal causality is replaced by circular causality because of the recursivity within the network (Schiepek, 1986, p. 120).

An example of a system model is depicted in figure 2.6. It presents the dynamics of a couple before a therapy.

Schiepek mentions five criteria which can be used to determine if a system model shall be further extended (Schiepek, 1986, p. 139):

1. Cost-Benefit Ratio. The benefits of expanding the system model needs to be evaluated against the costs necessary for the expansion. In counseling, this will mainly be a matter of the available time.

2. Conciseness. A system model too wide-stretched or with a high density of elements leads to complexity inflation rather than complexity reduction.
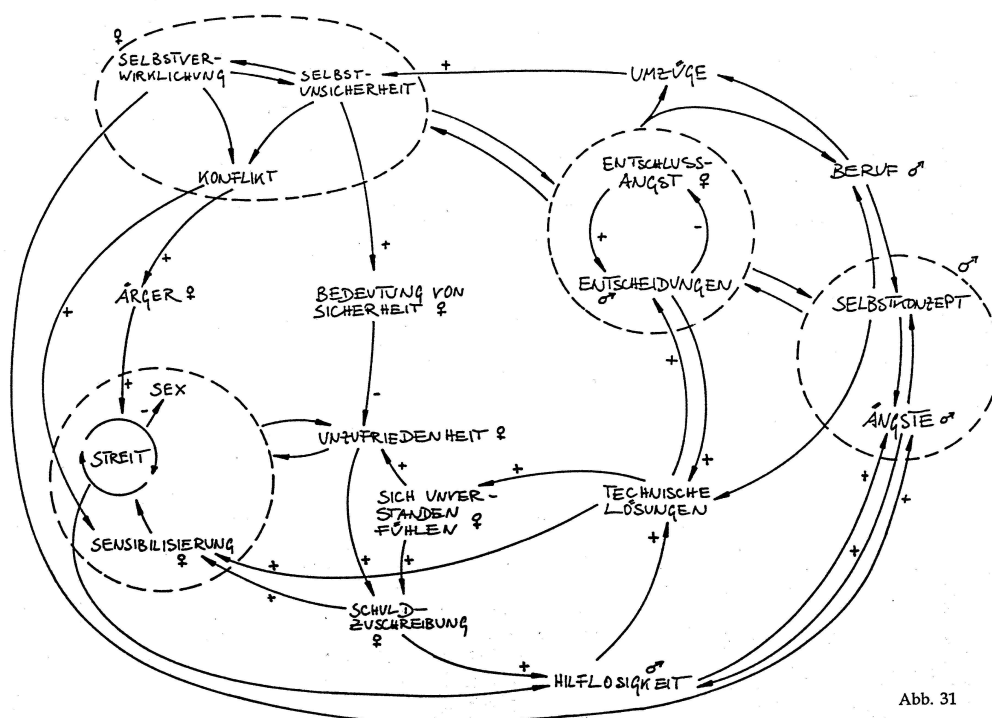
Figure 2.6: System Model - an Example

Example of a system model depicting the the system dynamics of a couple at the beginning of therapy. Courtesy of Günter Schiepek, (Schiepek, 1991, p. 81).

3. Probability of Success. The probability of success of interventions should increase when broadening the data base. If this is not the case, the model is sufficient.

4. Pattern Reproduction. The process of the system modeling can be stopped if the model reproduces the dynamical patterns reported by the client.

5. Accessible by Interventions. System elements which are integrated into the system model by expanding it need to be accessible by an intervention. Although, the integration of such elements helps to make them explicit.

Self-referential and self-organizing systems do not change with respect to interventions but with respect to their own structure. Interventions distract systems, they are absorbed and assimilated according to the system's structure (Böse & Schiepek, 2000, p. 173). System models now can serve to identify points of access for those distractions (Schiepek & Kaimer, 1988, p. 260). The visualized model provides an overview of the mutual dependencies between system elements and shows ways to influence the modeled behavior. Especially, counseling in a solution-

and resource-oriented manner provides the foundation of destabilization by raising the motivation for change (Schiepek & Kaimer, 1988, p. 262). Whereas learning or changing of a model is represented by modifying the impact between two elements (Casper et al., 1992, p. 723), the Idiographic System Modeling usually does not define the relations so precisely since it is not the intention of the method to concisely map a system's development at every point in time.

Lastly, it shall be mentioned that not only the resulting model is systemic by definition; the development of the model as well is a recursive process between client and counselor in order to identify elements, their relations, and their meanings (Schiepek & Kaimer, 1988, p. 259).

Generic Principles

The Generic Principles describe conditions which create the necessary framework for a change process. This may be in therapy, counseling, or in organizational development. Considering them enhances and supports self-organized development and learning processes, and allows order-order-transitions to a qualitatively new state (Schiepek & Kröger, 2000, p. 244). The Generic Principles help to structure professional management of those processes by giving guidance for selecting appropriate techniques and methods depending on the clients' state. Due to the central position of the Generic Principles within the construct systems competence, they shall be presented in the following. The construct systems competence lists them in dimension 2 (Dimension Time) and dimension 4 (Developing Conditions for Self-Organization).

1. Generic Principle 1: Creating Conditions of Stability

   Change means the destabilization of existing patterns. Since no living system would agree to start a process of unlimited destabilization some aspects of stability during a change process are required (Schiepek, 1999b, p. 293). Although incertitude and limited predictability occur in all change processes, there has to be some planning reliability, and thus, stability. This can be created on three levels: structure, relationship, and self-competence. Structural stability is created by a specific setting in which the change process happens. This includes the setting's structure with certain constraints (e.g. location, duration, counseling procedure). Also, a transparent counseling procedure helps clients to stay oriented and aware of their position in the change process (Hoffmann, 1994, pp. 21-26). Second, a stable trustworthy relationship between client and counselor supports the change process (Schulz, 1994, pp. 15-20). With respect to this, this Generic Principle comes close to Grawe's impact factor "counselor-client-relation" (Lutz & Grawe, 2005, p. 96). And last, there are techniques to help the clients' to experience self-competence; stability that lies in the clients themselves. These are techniques to support self-esteem, self-efficacy, and identify resources which help the clients to experience control and competence in themselves (Schiepek, 1999b, p. 293), (Grawe, 1999, p. 554).

2. Generic Principle 2: Identifying Patterns of the Relevant System

A change process always refers to a system which first has to be defined at the beginning of the consultation. This includes the identification of relevant elements, setting the system boundary to delineate the system from the environment, and the relations between the elements. Order parameters, and thus, descriptions of the system's behavior help to understand the existent form of appearance (Haken & Schiepek, 2006, p. 629). The interconnection between the elements and the reciprocal impacts create the framework for the change process. Well developed models are able to reproduce the system's dynamics and behavior (Vester, 1999b, p. 21). On this base, interventions can be carried out and changes in the system can be evaluated. Several methods can be applied: Idiographic System Modeling (Schiepek, 1986), (Schiepek, 1991), States of Mind - Analysis (Beirle & Schiepek, 2002), and Plan Analysis and Scheme Analysis (Schiepek, Kowalik, Gees, Welter, & Strunk, 1997, pp. 42-48).

3. Generic Principle 3: Sense-Making / Coherence

Changes shall be put into connection with the clients' life script and made congruent with their life style (Haken & Schiepek, 2006, p. 629). This involves the past, present, and future of the client. Also, the change process itself and the associated effort, time, and emotions should be put in congruence with the anticipated change. This is even more important in difficult times. The feeling of coherence happens on an intuitive level, a conscious control of the process is usually not given (Schiepek & Kröger, 2000, p. 247). The sense of coherence is an all-embracing orientation consisting of three components: the first component describes to what extent internal and external stimuli are experienced as structured, predictable, and explicable. The second component describes the extent the individual is convinced to have the necessary resources to cope with the requirements stemming form those stimuli. The third component describes how those requirements are worth the effort and commitment. This sense of coherence is constantly existent, but nevertheless dynamic (Antonovsky, 1997, p.36).

4. Generic Principle 4: Identifying Control Parameters / Enabling Energization

Changing from one state to another state requires the system's energization. From the Synergetic point of view energization means changing the control parameters which can be either found in the client's environment or within the client. Although change motivation and self-efficacy-expectation have been suggested as possible control parameters (Manteufel & Schiepek, 1995, p. 304), (Haken & Schiepek, 2006, p. 422), the identification of relevant control parameters proves difficult in counseling (Droste & Schiepek, 1997, p. 256). From a present state a new state shall be developed which is more desirable and motivating enough to reach it. According to Synergetics, finding the relevant control parameter and changing it will result in a different order. In counseling this means identifying and working on a client's goals, visions, and concerns rather than identifying and describing the client's problems (Berg & Miller, 1993, chapter 5), (Friedmann, 2004, p. 83). Goals do not exist per se but they are constructed by the client and counselor.

Refining, prioritizing, and balancing them is an important aspect of counseling. It also prevents the counselor-client-system to split up (Kaimer, 1986, p. 222). During counseling goals can change just like the affected structures of the client (Böse & Schiepek, 2000, p. 235). This - as well as identifying the client's resources - form a stable motivational base for a change (Schemmel & Schaller, 2003), (Schiepek et al., 2001, p. 101), (Grawe, 1999, p. 554). With respect to this, this Generic Principle comes close to Grawe's impact factor "resource activation" (Lutz & Grawe, 2005, p. 96) which again can be equate with competence activation (G. Schmidt, 1999, p. 85).

5. Generic Principle 5: Destabilization

   Counseling means making new experiences. This can either mean to change to a different state or to learn a new state (see page 22). Destabilizing existing cognitive, emotional, and behavioral patterns and leading to new more preferred ones is the core of each change process. It means leaving a well-known situation and leads to the exploration of a new state. In counseling, this means to perturb an attractor of disorder with the objective of changing the behavioral patterns to a desired attractor (Grawe, 1999, p. 503). Several techniques can be utilized to perturb those patterns and to allow different experiences, as there are: role games and behavioral experiments (Linden & Hautzinger, 1994), working on exceptions of a problem (Wiesflecker & Kubinger, 2005, p. 56), working on discrimination of perceptions (Petermann, 1994), developing alternate comprehension of situations and their meanings (reframing) (Schlippe & Schweitzer, 1999, pp. 177-181), confrontative and provocative procedures, to name a few.

6. Generic Principle 6: Resonance / Synchronization / Kairos

   Each counseling procedure should meet the client's cognitive and emotional state. The client's self-relatedness is considered a very important variable in successful therapy (Ambühl & Doblies, 1991, p. 300). Congruent messages and interventions have a higher probability to be adopted when the client is able to accept them (Ambühl, 1991, p. 84). The temporal fit and coordination of interventions and the style of communication can be considered as a precondition for a successful change process (Ambühl & Grawe, 1988, p. 325), (Ambühl & Mühlemann, 1991, p. 256). On a short-term scale the client's receptiveness can be read from mimics, eye contact, pauses, using metaphors or idiosyncratic terms. On a long-term scale, this concerns the number of meetings and their intervals. Resonance refers to the counselor's ability to react adequately to the client's actions and reactions (Hesse, 1999, p. 59). Synchronization is the adoption of a client's rhythm seen from a chronological point of view over the run of a complete change process. Kairos (derived from the Greek God[2]) refers to the right or opportune moment, like setting the appropriate intervention at a moment the client can adopt it rather than following a standardized procedure (Haken & Schiepek, 2006, p. 426). Finding the right kairos can be considered as a central variable in therapy (Ambühl & Grawe, 1989, p. 21).

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[2]http://en.wikipedia.org/wiki/Kairos

7. Generic Principle 7: Enabling Symmetry Breaking

   From a Synergetic point of view, symmetry refers to a situation of a system's critical insta-bility in which two or more orders could be instantiated with a similar probability. Already small variations (critical fluctuations) can break this symmetry of alternatives and lead to the implementation of a specific order (Schiepek, 1999b, p. 286). In a counseling process this Generic Principle becomes relevant when two or more alternatives are rated equally attractive and a decision has to be made for one of the alternatives. In such a state, methods have to be applied that prioritizing different alternatives in order to choose one. Methods to imagine goals and desirable states can be used, and next to these mental representations a somato-sensoric representation is of high significance (Haken & Schiepek, 2006, pp. 439-440). All activities conducted in the sense of this Generic Principle aim to break the symmetry; it is broken when a client opts for one alternative.

8. Generic Principle 8: Re-Stabilization

   Once a desirable state is described and attained, the new obtained cognitive, emotional, and behavioral patterns of this state need to be internalized, trained, and stabilized. There are many methods for stabilization and generalization: repetition, variation, transferring into different contexts, and positive reinforcement. Training helps to keep these patterns accessible and available for the future. In equal measure it is important to integrate the newly acquired patterns into the client's self-concept and existing self-schemata for a suc-cessful implementation (Haken & Schiepek, 2006, p. 440).

As described, the Generic Principles form the framework for self-organizing changes. They seem to follow a logical linear order which has to be ensued from principle 1 through principle 8. They are meant to be a guideline for reflection and decision-making upon the client state during counseling. Depending on this assessment the counselor chooses the associated techniques and methods. The Generic Principles apply to all sessions over run of a counseling. As an example, creating stability is evidently important at the beginning of counseling, but it remains important throughout the complete counseling process. As well, this holds true for Generic Principle 6 (synchronization). A good relation between counselor and client is important throughout a complete counseling interview. Thus, this principle can be assumed to take effect the whole time.

For a prototypical initial interview, Generic Principle 2 can be assumed to take effect quite soon (contextualization of request), followed by Principle 4 and 5 with a slight off-set. The Generic Principles 7 and 8 can be thought to be of little concert for an initial interview. Generic Principle 3 can be thought to take effect on and off whenever it is necessary to support the clients' congruence.

This prototypical interview process may look different for each interview but definitely varies from interview to interview from an initial interview to the closing of the counseling.

2.2.4 Evaluation

This section describes gaming simulation, System Role Play, computer scenarios, and assessment center as possible scenarios in which systems competence can be trained and evaluated. They are all characterized by complex, intransparent settings. Thus, a competent person should act in those situations differently from persons without training in systems competence.

Gaming simulation

Gaming simulation describes a number of methods of experimental learning that go beyond the methods of business games or strategy exercises. This comprises methods like, role games, team exercises, scenario techniques, computer simulation, learning and knowledge games, and strategy exercises (Kriz & Gust, 2003, p. 14). All these methods have in common that complex problems can be simulated with their inherent characteristics complexity, intransparency, interdependence, and self-dynamics in a group setting (Dörner, 1994, p. 72). Gaming simulation pretends as if the simulated situation were real. The individuals or groups mastering such a situation can test their knowledge and competences and improve them in a playful manner (Dörner, 1994, p. 71). The compression of time helps to understand the impact of actions and to learn the interdependency with a complex system (Ramnarayan, Strohschneider, & Schaub, 1997, p. 40). For research purposes gaming simulation can be used to validate and generate empirical data, theories, and theoretical models.

Unlike role games, which usually imitate counseling situations, gaming simulation includes social dynamics and technical and economical processes which require a minimal input of resources (e.g. material, information) (Kriz & Gust, 2003, p. 14). Gaming simulation focuses on decision planing and decision making in a given structured, but yet complex case study. There are two types of games: rigid rule games and free form games. The rigid rule games provide instructions and a problem case which is meant to be solved by the participants by optimizing the decision processes, acquiring competences in planing and decision making, and stimulating innovative developments (Manteufel & Schiepek, 1998, p. 83). The free form games are less strict with respect to initial input and guidelines. The rules are generated throughout the simulation by the participants of the gaming simulation. This variant focuses on the self-organizing processes and the construction of a common social reality (Kriz & Gust, 2003, p. 14).

For becoming competent in systems, the approach of experiential learning is considered highly valuable. The experiences gathered in a complex, social situation and reflecting about these experiences triggers the assessment, definition of consequences, and generalization of the insights to future situations. Gaming simulation helps an individual not only to deal with the cognitive aspect of a subject but also challenges the emotional and behavioral facets (Kriz, 2000a, p. 187). Therefore, gaming simulation is an expedient method to simulate complex social systems and it is an excellent way to gather experiences of one's acting in such situations (Kriz, 2000, p. 96). Thus, it can be utilized to train systems competence and also evaluate an individual's competence behavior since it provides an opportunity to monitor one's own thinking, sensation,

and behavior, and this insight can then be used to enhance one's performance (Ramnarayan et al., 1997, p. 41).

At the present time, there are no reported approaches for the evaluation of systems competence by gaming simulation. Kriz is the only author who adopted the approach to a certain extent. He developed a training model for systems competence and conducted various trainings with a total of 123 subjects. The positive effect of the trainings was evaluated by life simulation games and computer simulation, showing that democratic and participative group behavior improved. Computer simulation showed that the training leads to a better way of managing indetermination and risk assessment (Kriz, 2000). Kriz does not report in detail about the evaluation instruments utilized, though. But he adopts a global approach in evaluating systems competences as a whole.

System Role Play

The System Role Play (SRP) is a research design which can be understood as a compromise between fieldwork and laboratory research and was advanced from gaming and simulation scenarios (Manteufel & Schiepek, 1993, p. 20). The SRP is a life-simulation in which complex social situations are simulated (Haken & Schiepek, 2006, p. 555). It is related to the free form gaming simulation. Since the targeted influence on complex systems is very limited (Schiepek & Kaimer, 1988, p. 260) the SRP focuses on interaction processes (Manteufel & Schiepek, 1994, p. 64) with as little influence as possible to allow developing the system's own self-dynamics (Schiepek, Manteufel, Strunk, & Reicherts, 1997, p. 127). It aims to identify macroscopic visible patterns of complex bio-psycho-social systems and to describe the process of ordering as a process of self-organization (Schiepek, Manteufel, et al., 1997, p. 126). Observing processes of social interaction on a behavioral, cognitive and emotional level is of particular interest. The methodology allows connecting aspects of individual perceptions and experiences with emergent patterns on a group level (Schiepek, Manteufel, et al., 1997, p. 127).

Before a SRP starts the participants receive a description of a given scenario and a role description. The role descriptions are created in a way that they provide potential for conflict between the roles or one of the subgroups to which each role occupant belongs (Manteufel & Schiepek, 1998, p. 86). This helps to facilitate the dynamics within the complete system. Normally, there are between 15 and 25 participants involved in a SRP who are divided into several subgroups. The run of a SRP depends on its purpose: for research-oriented purposes five 2-hour sessions are indicated, in training situation three 1.5-hour sessions are considered sufficient (Haken & Schiepek, 2006, p. 555). Along the concept of equifinality, the outcome of each SRP is different despite the same initial conditions (Böse & Schiepek, 2000, p. 74)(Manteufel & Schiepek, 1998, p. 88). To develop vivid self-dynamics it is important to describe the scenarios open-ended and not to over-specify the role descriptions (Manteufel & Schiepek, 1994, p. 68). The SRP is embedded into a workshop that starts with a general briefing, introduction into the scenario and the distribution of the role descriptions. Each session is interrupted by breaks which allows for documentation and evaluation. The workshop ends with a thorough debriefing in which the participants can exchange their experiences (Manteufel & Schiepek, 1998, p. 91).

For documentation and evaluation of the SRP there are documentation sheets that are filled out by each participant after an interaction with another participant. The documentation sheets are used to reconstruct the SRP and are useful for the debriefing (Manteufel & Schiepek, 1998, p. 98). Also, there is an evaluation sheet for the perceived stress level (Manteufel & Schiepek, 1998, p. 105). It is possible to integrate different quantitative and qualitative measures into the run of a SRP depending on the focus of interest.

The interaction of the players creates it own unique social structure and the participants can experiment how their individual behavior influences the emerging macroscopic structure and how they are restricting themselves in some of their intentions or actions (Manteufel & Schiepek, 1994, p. 69). The SRP gives the opportunity to experience the complexity, interdependence, and intransparency of complex systems by being one element in the system (Manteufel & Schiepek, 1993, p. 21). As well, the limitations of forecasts in complex systems due to the high number of system elements is part of the participants' experiences (Manteufel & Schiepek, 1994, p. 70).

The SRP can be considered as a research design that allows the observation of order structuring, change of orders in complex social systems with qualitative and quantitative methods. The methodology permits viewing the dynamics from multiple perspectives (Haken & Schiepek, 2006, p. 555). In training programs, especially in the area of psychosocial counseling or social work, it can be used to gather experience by being part of a complex system and its influence on behavior, cognition, and emotion. Also, the participants can experience how competently they act (Gussone & Schiepek, 2000, p. 101).

Computer Scenarios

Complex problems are quite different from everyday problems since they are characterized by long-range effects, weak causal relations, and intransparency (Dörner, 1996, p. 491-494). In everyday situations we are used to see an immediate reaction to a cause: turning a light switch immediately turns on the light; a car reacts directly by stepping on the break. But due to the high degree of interdependency and interaction of components in a complex system, an intervention seldom leads only to one occurrence because of the networked components. There are side effects and as a consequence there are effects that are not at first predictable (Dörner, 1996, p. 512). Reaction times often are not considered. Also, in everyday situations there is a high correspondence between the size of the intervention and the size of the effect: the more the volume button is turned the louder the music will be.

But a complex system is determined by weak causal relations. Therefore, they are often not considered in favor of strong causal relations. This leads to the perception of chaotic behavior because the weak causal relations often are not reflected. Acting in a simple situation is characterized by knowing how the relevant components work and influence each other. Complex situations are marked by the opposite: components or their interrelations change without our notice which leads to gradual nescience of the situation. The human ability of managing such complex situations was intensively studied by Dörner et al., who used computer scenarios as a research design. They used computer simulations (e.g. Lohhausen (Dörner et al., 1996)) in

which probands were asked to manage and steer complex systems. The systems were more or less complex and partly intransparent (compare structure of Lohhausen-system (Dörner et al., 1996, p. 110)). The scenarios are based on a system of hypotheses with mutual impacts (compare (Dörner, 1996, p. 505)) which again are specified with algorithms and transferred into programming language. To be able to program, the underlying model needs to be precise and comprehensive which itself provides valuable insight when real systems are modeled (Haken & Schiepek, 2006, p. 645). After defining the visible components that are directly influenceable, often non-visible components need to be defined to reproduce the system's complete behavior (Dörner, 1996, p. 507). The probands received instructions like taking care of the well-being of a city's population (Dörner et al., 1996, p. 107), supervising a refrigerated warehouse (Dörner & Reichert, 1988, p. 13), or predicting the progression of an HIV epidemic in a large city (Dörner, 1996). A number of error sources are identified when dealing with complex systems. For example, there are: inadequate information gathering (Dörner, 1994, p. 73), misinterpretation of growth processes, lack of knowledge (Ramnarayan et al., 1997, p. 40), neglecting time lags of interventions (Dörner, 1996, p. 497), fixing behavior (solving the present problems) (Dörner, 1989, p. 89), focusing on one variable (Dörner, 1996, p. 501). Reflecting one's own behavior proves to be helpful in managing complex, dynamic systems successfully since it enhances flexibility and plasticity of the thinking process (Dörner et al., 1999, p. 200). Computer simulations are useful in enhancing the abilities needed for managing complex, dynamic systems although they always create unnatural situations. In reality, it is unlikely that important decisions are made alone with the assistance of co-workers or any other kind of assistance (Manteufel & Schiepek, 1998, p. 194). But irregardless of this, they are equally applicable for research and training. In research they are helpful for verifying empirical data and hypotheses of theories or models. As a training instrument they can be applied to develop abilities and skills when complex situations can not be created in reality (Dörner, 1994, p. 71).

Assessment Center

An assessment center is a method for employee selection and development mainly used in enterprises. Originally established for the selection of managers, specialists, and trainees, it has been used as an instrument for employee selection from the 1970s on. Assessment center and development center are very similar in structure but differ with respect to their intention. The assessment center emphasizes the measurement and assessment of competences with respect to an available position with the goal to find the right person for the described position. At a development center, the focus is on analyzing strengths and weaknesses of an individual's performance in order to develop a development plan for the future. This can be found in combination with internal performance or potential analysis (Altink & Verhagen, 2002, p. 190). In the case of an assessment center for employee selection a thorough requirements analysis for the position to be filled has to precede (Winkler, 2002, p. 271). Both methods follow a number of principles (Sarges, 1996, p. VII), (Amelang & Schmidt-Atzert, 2006, p. 459):

- Multiple Participants. 8-12 participants are assessed at once, which is important since some of the assessment techniques take place in social situations (discussions, role games).
- Multiple Observers. Multiple observers are considered necessary to minimize observation errors. Intensive and repeated training also helps to reduce the variance in the observation. Often line managers are used as assessors which has especially one advantage: The managers know their corporate culture and thus can make a sound decision of the fit between the future employee and position.
- Multiple Situations and Methods. The participants face several different situations. As well, multiple methods are applied for capturing the necessary data, as there are: intelligence tests, performance tests, interviews, biographical questionnaires, role games, presentations, in-tray method, discussions, and computer simulated business games (Hesse & Schrader, 1994, p. 23).
- Duration. Due to the number of assessment methods and participants, the assessment center takes a couple of days.
- Task and Behavior Orientation. The assessment center focuses on an individual's ability to perform certain tasks in a certain position. But there is no focus on personality traits but on behavioral patterns.
- Transparency. The requirements and the observational criteria are often known to the participants. As well, the goal of the assessment center is obvious. Giving feedback about the participants' performance make the method even more transparent and raises its acceptance.

Often, the performance criteria of assessment centers are discussed. Especially the indexes of reliability (internal consistence, interrater-reliability) are only moderate, the validity indexes show a high variance of the coefficients. Despite these methodological problems there is a high social validity which may be the reason for its continued high acceptance in companies (Amelang & Schmidt-Atzert, 2006, pp. 462-465). Assessment centers and even more development centers are implementing systems competence. These scenarios can be used to acquire and enhance competence in dealing with complexity, dynamics, and a high degree of interconnectedness (Haken & Schiepek, 2006, p. 646). But there is still need for more research to improve the performance indexes (Strauß & Kleinmann, 1996, p. 81).

2.3 Summary

The interdisciplinary research discipline of Synergetics provides the theoretical framework for explaining the process of order creation in complex systems. This process is self-organized and follows an intra-systemic logic. The targeted influence of the system by extra-systemic factors is possible, but only indirectly. Originating in theoretical physics, Synergetics has diffused into other research disciplines that consider complex systems and their self-organization processes. Empirical evidence found in each discipline has shown the transferability of this theoretical

approach. Despite the different application areas of Synergetics, there is a common core: the base model of Synergetics. It depicts how the interaction of system elements are consensualized by a prevailing order parameter that reduces the degrees of freedom for those elements. Thus, the elements can show only a reduced set of characteristics and stabilizes the order in return. On a macroscopic level, the system portrays a coherent behavioral pattern. The prevailing order of a system is influenced by control parameters which are either external or set within the system. Changes of this control parameter have no effect up to a critical point, at which the system can no longer absorb these changes. Therefore, the system changes its behavior rapidly and a different behavioral quality emerges. The system makes a transition from one order to another order.

The self-organizing nature of the processes viewed from a Synergetic point of view raises the question how systems can be supported in order to change. The construct systems competence is a compilation of competences suggested for working with complex, social systems. The construct contains six dimensions: (1) Social Competences, (2) Dimension Time, (3) Emotions, Coping with Stress, Mobilization of Resources, (4) Developing Conditions for Self-Organization, (5) Knowledge, and (6) Pattern Recognition and Pattern Modeling. The knowledge, abilities, skills, and competences listed in these dimensions enable counselors to support the development of a system. The Generic Principles - as the core of the construct - are listed in dimension (4) developing conditions for self-organization. They describe eight states of a counseling process. Depending on the state of the process, appropriate interventions are selected to support the process. The contents of the other dimensions provide the necessary instruments. One example, is the Idiographic System Modeling of the dimension "Pattern Recognition and Pattern Modeling".

To date, there is no systematic operationalization of the construct systems competence, although, several methods have been suggested. Scenarios in which system-competent behavior can be evaluated are: gaming simulation, System Role Play, computer scenarios, and assessment centers. These scenarios allow the comprehensive consideration of system-competent behavior. The operationalization of single competences or aspects of the construct is still missing.

Chapter 3

Competence

Competence and competence development has been gaining a lot of attention in economy and science over the last fifteen years. The current discussion about competence development originated when the economic and working environments changed in a way that the arising challenges and demands could not be met with just "qualified" employees. Competent employees became an important key word in vocational training. This shift of perspectives from qualification to competence was triggered by the German reunification in 1990. As a consequence, the economy of the former GDR had to be drastically reorganized. One aspect of this reorganization was the question how to "professionalize " the employee capital of the former GDR up to Western standards. Many training programs were set up to impart the necessary qualifications - formal certifications of objective performance criteria derived from task requirements. As the initiative showed quite soon, the traditional idea of "qualifying" the employees missed out. More comprehensive programs were demanded which resulted in focusing on competence rather than qualification. Competence became a research topic and increasingly important for economical success; almost up to the point of inflationary usage (Erpenbeck, 2001, p. 102).

This development reflects societal changes in transformations of the work organization. Increasingly complex, dynamical and nontransparent environments demand flexible and dynamic employees who can adapt their behavior to processes being changed to an ascending degree (Veith, 2003, p. 222). Technical and organizational conditions vary faster than the human capital and new jobs are created that require higher and more qualifications. In Germany, on average, each jobholder changes jobs every third or fourth year and each year over 8 million job positions are filled in 2002. Knowledge and qualifications for one specific job becomes less important compared to process-related qualifications and social qualifications that help employees to start in a new job (Schickler, 2002, p. 473). At present, competences are thought to be the appropriate concept to face these challenges. They are even thought to increase innovativeness (Institut für angewandte Innovationsforschung e.V., 2001). Along with these changes the thoughts of self-organization provided by the theoretical framework of Synergetics has influenced the discussion

about competences (Martens & Nachtigall, 2006, p. 117).

The following chapter introduces the concept competence, its etymological origins, the prevalent definitions, and the conceptual framework by Erpenbeck and Rosenstiel which is considered the most recent and most elaborated conceptual definition in competence research, at least in German-speaking literature. Furthermore, related concepts are described and set into relation to competence for conceptual discrimination. The chapter closes with examining competence assessment and its arising challenges, as well as considerations of factors enhancing and supporting competence development.

3.1 Conceptualization

This section gives a definition of competence according to the current state of the art. To introduce the definitional context, the etymology of the term is illustrated before presenting different definitional aspects. Competence models that are based on competence definitions are described, and the prevalent competence model is discussed in more detail.

3.1.1 Etymology

In the German language, the term *Kompetenz* (German = competence, expertise, capacity) has been part of the vocabulary ever since Roman times. The primary usage was in the field of law. It was not until sixty years ago, when different areas of expertise adopted the term and different meanings emerged. The following short abstract of the etymology of the term competence depicts its use in the German language.

The term competence can be traced back to the Latin verb *competere* which translates to "to coincide, to belong, to seek". In Classical Latin (75 BC - app. 200) the noun *competentia* is used in the meaning of "coincide" or "coming together". For example, competentia describes a constellation of stars. The adjective *competens* (Latin = adequate, appropriate, responsible) appears in Medieval Latin (300 - 1300). Used as an attribute by Roman jurists, it describes magistrates or civil servants as "(personally) qualified" or "adequate" for their position. The meaning of the noun *competentia* changed from "coincide" to "aptitude" and "qualification". The verb *competere* received the additional meaning of "to strive" and "to fight". From the 13th century on, *Competenz* describes the income which a person is entitled to. It, especially, refers to the necessary means of subsistence, frequently used for clerics. In the middle of the 17th century, Roman law established *beneficium competentiae* as an instrument of law (Bauder, 1905, p. 8). It means that a creditor may only claim so much from a debtor so that the debitor's means of subsistence is not endangered. Taking up the meaning of necessary means for subsistence, competence was continued to be used in the German army until the 19th century. Competence describes what has to be spent for different areas regarding military life: wages, clothing, food (Huber, 2001).

A systematic review of the terms *competens* and *competentia* is provided in Johann Heinrich

Zedler's Universallexikon (1732-1754) (Zed, 2007), one of most comprehensive encyclopedias of the 18th century. Ever since then, the concepts competence (Kompetenz), question of authority (Kompetenzstreit) and conflict of jurisdiction (Kompetenzkonflikt) are connected to the differentiated organization of political systems employing division of labor (Erpenbeck & Rosenstiel, 2003), at least in the German language: in constitutional law competence describes the jurisdiction of high government bodies and their subsequent organizations with respect to the tasks to be met and the authority to be performed. In administrative law, competence describes obligation between an authority and its function. The term competence manages the authorities' relations between each other (Huber, 2001).

In biology, the term competence refers to the natural ability of a number of bacteria to accept alien DNA which floats freely in the dilution surrounding the bacteria (Kompetenz, Zellen, Bakterien, DNA, 2003). Competent cells have of a modified cell surface which is more porous than the surface of non-competent cells. Also, there is a higher activity of extra-cellular enzymes. Whether a cell is able to act competently depends on the structure of the alien DNA but it also depends on the physiological state and the growth phase of the bacteria themselves (Schlege & Zaborosch, 1992).

In 1959, Robert White introduced the term competence into motivational psychology. In this area, competence refers to an organism's ability to interact effectively with its environment, which neither is innate or happens by maturation (White, 1959, p. 297). Competence is the result of a learning process that has a playful and exploratory character but yet directed, selective and persistent in interacting with the environment. This development process is stimulated by requirements of the environment an individual has to deal with. To obtain and increase the personal efficiency an individual learns and develops competences (H. Heckhausen, 1989, p. 362). Competence in sensu White means to show behavior. This behavior is performed because of an individual's intrinsic need to interact with the environment not because it is triggered by primary drives (White, 1959, p. 318), cf. (J. Heckhausen & Heckhausen, 2006, p. 334).

In linguistics, the term competence became important after 1960 . Chomsky introduced it into linguistic terminology to make a distinction between the knowledge about a language (competence) and the execution of this knowledge (performance) (Chomsky, 1978, pp. 13-15): Competence is the ability of a speaker or a listener to form and understand a potentially infinite number of sentences by executing a limited number of combination rules and elements. It reflects a speaker's knowledge about a language which often can not be verbalized due to its mostly implicit nature. Performance describes the application of this knowledge by speaking or listening (Anderson, 1996, p. 345). The proper execution of a speaker's language competence - the language performance - is influenced by loss of attention, limited memory, absent-mindedness etc. which causes mistakes in the performance.

The definition of competence, as it is used in the current discussion about long-life learning and work environments, is based on Chomsky. The difference is that nowadays there is no differentiation between competence and performance and it is used in the discussion about profession-related competences (Franke, 2005, p. 37). As well, interacting effectively with the environment, as White suggested, is part of modern definitions. Competence shows in compe-

tent behavior. Showing competence - called action competence - is a competence itself, as will be explained in the following sections.

3.1.2 Definition

The current discussion is affected by an inflationary usage of the term competence whilst loosing conceptual and theoretical precision at the same time. Education, qualification, competence, and key competences are widely spread concepts in matters of education policy regarding learning in school, profession, and adult education (Bodensohn, 2003). The distinction and implications of these different concepts often overlap considerably, which confuses the concise discussion and usage of these terms.

The attempts in conceptualizing competence are driven from two perspectives. First, the scientific perspective aims to define competence in a scientifically plausible and sound way to comply with scientific criteria and standards. Second, there is a need for a pragmatic definition of the term (Rychen & Salganik, 2003, p. 2, 3). This perspective is triggered by the complex demands of work life. Depending on the perspective and goals of the authors, the approaches conceptualizing competence differ with respect to their scientific pretension.

In Germany, the discussion about competence primarily has been influenced by the state-aided consortium *Arbeitsgemeinschaft Qualifikations-Entwicklungs-Management (QUEM)*. It was founded in 1992 in order to assist the employees of the former GDR in adapting to the changed requirements in work life and managing the transfer from command economy to market economy (Meyer-Dohm, 2002, p. 13). The founding of QUEM lead to a shift from considering the qualification of employees for work life - a development started decades before - to make employees competent for their work. Professionalizing employees after vocational trainings in work situations has become of increasing importance from the 1970s on and has led to more attention to human resources and professional trainings (Frieling & Sonntag, 1987, p. 85). The expenses for advanced trainings and adult education rose considerably, as well as gaining more attention from political and industrial associations (Meyer-Dohm, 2002, p. 15). In 1989, the German reunification started a societal and economical transformation process. For a high percentage of GDR's manpower this meant having to be qualified up to the requirements of the new market. The extent of this endeavor could not be anticipated at first. But, when there were about one million participants expected to participate in qualifying programs and further education by the end of 1992, the German Federal Ministry of Education and Research initiated QUEM to monitor the success of these activities (Meyer-Dohm, 2002, p. 17). Following this task, QUEM changed its focus over time according to the research results. Until today, three major development phases can be observed that influenced the subordinate activities: professional training, competence development, and learning culture. Competence also received attention from political entities, which resulted in national funding programs[1] and initiatives from employers'

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[1] BMBF: Kompetenzen fördern - Berufliche Qualifizierung für Zielgruppen mit besonderem Förderbedarf, http://www.bmbf.de/pub/kompetenzen_foerdern.pdf; June 2007

associations (Hundt, 2001).

Competence as a construct is not directly observable. As a consequence, existing competence often is not perceived. It is the lack of competence that becomes obvious (Bernien, 1997, p. 25). Judging competence requires observing behavior, which again is attributed to the assumed underlying competence. Thus, competences are reconstructed from observed performance (Ridder, Bruns, & Brünn, 2004, p. 55). Various research designs are applied in competence research. As an interdisciplinary field it involves many disciplines, applying quantitative or qualitative research designs. Quantitative approaches employ research designs of psychology, pedagogics, education science, sociology and analyzes (self-) statements, behavior, physiological or even neuronal processes. From a psychological perspective quantitative methods are highly structured, standardized, and objective measures. This approach reflects the common understanding of gaining insight into a phenomenon. As a result, quantitative research is interested in measurability and scalability of competences by applying tests, experiments, and questionnaires. The prevailing perspective looks at the competence holder from an external perspective (Erpenbeck & Rosenstiel, 2003, p. XX). Qualitative approaches are based on a number of observation methods and biography research. In contrast to quantitative research designs they are more holistic and subjective accentuating the internal perspective of competence. Modern competence research requires a combination of both approaches in order to capture the complex phenomenology of competences (Erpenbeck & Rosenstiel, 2003, p. XXI).

The construct competence consists of various components that are needed for acting out competence (Sarges, 2002, p. 288). The components which are often mentioned are: experiences, explicit knowledge, values, norms, abilities, and skills. All of them are continuously acquired and enhanced throughout a life-time (Trier, Hartmann, Aulerich, Bootz, & Buggenhagen, 2001, p. 94) since they are subject to change due to environmental or internal influences. Knowledge is an important factor, and different knowledge aspects are used to show competent behavior. They are integrated and utilized for providing solutions for upcoming problems in combination with the other mentioned components (G. Bergmann, Daub, & Meurer, 2004, p. 23), (Mittelstraß, 1999, p. 61). Thus, competence can be defined as the ability to act adequately in a number of different situations (Wilkens, 2005, p. 7) by transferring abilities, skills, and knowledge into action (North, Friedrich, & Lantz, 2006, p. 152). Skills refer to automized components of activities trained by exercise and repetition under little conscious control as a matter of routine (Staudt & Kley, 2001, p. 237). They can be dissected into abstract rules and algorithms (Rychen & Salganik, 2003, p. 51). Similar to competences, they are action-centered (Erpenbeck & Rosenstiel, 2003, p. XXVIII).

If competence is defined as adequate acting, then it describes the goal-orientated actions of an individual: the relation between requirements that individuals have to meet and the individuals' abilities or potentials (North & Reinhardt, 2005, p. 29). Thus, being competent is bound to an activity and an individual at the same time (Bernien, 1997, p. 25). Those abilities allow mastering various situations in life in manifold roles and complex settings (Merki & Urs, 2003, p. 126). Competent persons have the necessary premises for successfully fulfilling those requirements.

The premises for such acting are the components, as they were mentioned above, are also called dispositions. They refer to those cognitive, meta-cognitive, and motor abilities which are learned and can be trained. On a very basic level, dispositions are genetically founded. The evolution of these dispositions depends on the environments, in which the individual grows up (Mangold & Soultanian, 2003, p. 139).

In contrast to competences, qualifications focus on the relation between mental dispositions and work requirements, whereas competences focuses more on those dispositions. Competences emphasize the dispositions which enable the individual to act effectively in changing environments (Minnameier, 2003, p. 2). They become apparent in actions and they describe premises for actions (Scharnhorst & Ebeling, 2006, p. 25).

From an educational point of view, competences have the advantage of looking at internal and constant dispositions that bring out a certain behavior and constitute competence instead of considering external factors (Minnameier, 2003, p. 3). Considering internal dispositions, and the basic assumption for competences to be learnable, are important premises. For this, it is necessary to coordinate abilities, skills, and knowledge into a coherent structure, regulated by an individual's values. This is transferred into action by volitional impulses (Erpenbeck, 1999, p. 1). Values, ethics or motivational aspects are sometimes referred to as the personal qualities of an individual (e.g. honesty, responsibility, sense of honor). They can not be defined as competences, because they are missing the characteristic of being associated with a specific type of demand. Though, values, ethics, and motivational aspects are constituents and foundations of particular competences (Rychen & Salganik, 2003).

A popular way of specifying competence is to define subcompetences (e.g. (North & Reinhardt, 2005, pp. 48-50), (Minnameier, 2003, p. 3), (Stangl, 2001). Due to their complex composition, separating the competences' constituents is a first step for a sincere evaluation (Sarges, 2002, p. 288). As intuitive and pragmatic this procedure seems, it does not solve the problem of giving a concise definition of a competence. It simply shifts the necessity of definition onto the next lower level. The descriptions of the subcompetences defining the competence overlap with respect to content and are often not selective anymore. Thus, scientific approaches in defining competence replace this attempt more and more, for the reason that dividing competences into subcompetences makes a competence merely an ability; just differently named (Minnameier, 2003, p. 4).

There are authors who are less interested in the theoretical aspects of competences, especially when writing for practical-oriented audiences. Zwell, for example, defines competences as a means to facilitate understanding between people, breaking down behavior in its components. He remarks that competence has "nothing magical" about it (Zwell, 2000, p. 24). Positive connotation, common understanding, and goal orientation are important factors in employing the term, rather than comprehending the internal structure of competence. Although, such strongly practical-focused definitions are not of interest for the scope of this thesis. It shall be remarked, though, that this simple conception may satisfy the needs of companies, and as such, may influence the general perception of the competence discussion.

Rychen and Salganik (Rychen & Salganik, 2003, p. 43) define competence as an ability that is employed to successfully meet complex demands in a particular context through the mobilization of psychosocial prerequisites. This approach concentrates on the results an individual achieves by acting. The demands align a person's decisions and actions. They can be related to work tasks, a social role, or individual objectives. This functional approach is able to integrate complex demands and challenges faced in everyday life and, especially, work environments. The authors consider the internal structure of competences to be composed of an individuals dispositions, such as: knowledge, cognitive and practical skills, attitudes, emotions, values, and motivation (Rychen & Salganik, 2003, p. 44). In order to act competently, these dispositions have to be activated, coordinated and put into action, aligned with the aspired goal to be achieved. This, again, emphasizes the context-dependency of the concept competence. Competences are considered in a specific context with characteristic demands placed on the individuals. The demands are met by actions which again have to be adequate to the particular situation (Rychen & Salganik, 2003, p. 47). Goetze is concordant with this definition, although adding, that competence is the result of a learning and/or reflection. (Goetze, 2001, p. 57)

Considering the nature of the competences' constituents, Frey and Balzer describe competences as mental and physical dispositions (Frey & Balzer, 2003b, p. 150). Minnameier, however, emphasizes that the dispositions are of a mental nature. They are important for acting successfully in a certain area. Also, competences allow the adaptation of an individual's behavior to new, unknown situations. Competences, thus, are fundamental for human behavior and human beings differ in the possession of competences (Minnameier, 2003, p. 5). Erpenbeck and Rosenstiel define competences as dispositions for self-organization. There are four classes of competences: professional-methodological competences, social-communicative competences, personal competences, and action competences (Erpenbeck & Rosenstiel, 2003, p. XV, XVII).

Predominantly in the current competence discussion, the competences of individuals are considered. But also, competences can be defined for groups (Scharnhorst & Ebeling, 2006, p. 28), organizations (Rychen & Salganik, 2003, p. 50), or even networks (Wilkens, 2005, p. 6). The concurrence of different individual competences emerges in a resulting team competence (Martens & Nachtigall, 2006, p. 197). This differentiation (Böhm, 2005, p. 122) resembles the construct systems competence (see table 2.1 on page 32). Competence is the base for corporate developments and facilitates the adaptation to changes in the team's environment (Staudt & Kriegesmann, 2001, p. 3).

3.1.3 Competence Models

A competence model is a conceptualization defining competence and presenting the main constituents. by this, the number of single competences is reduced by categorizing and combining the competences into a common framework. In the following, a few models are presented. Most of them contribute only in giving competence categories and the inherent subcompetences. Often, they are not further integrated into mental or behavioral structures and patterns.

In 1993, Sonntag and Schäfer-Hauser distinguish three categories: professional competences,

methodological competences, and social competences (Sonntag & Schäfer-Rauser, 1983, p. 165). The threefold categorization is taken up again by North and Reinhardt in 2005 (North & Reinhardt, 2005, p. 43). These three basic categories form the core of any succeeding model, which in the end has led to the competence model by Erpenbeck and Rosenstiel. In 1996, Erpenbeck and Heyse suggest a model that extends the three categories by adding a fourth category called participation competence. The categories of social competence and participation competence are not quite distinct, and the contained subcompetences partly overlap. All four categories result in actions, which are supported by action competences (Erpenbeck & Heyse, 1996, p. 42). This fourth category is renamed one year later and called personal competence. The content of this category remains the same (Bernien, 1997, pp. 32-33). Taking up the four categories, Frey and Balzer give detailed descriptions and examples of the constituting subcompetences for each competence category. As well, the authors mention that the interconnected competence categories build a person's action competence (Frey & Balzer, 2003b, pp. 150-154) (also see the description in (Erpenbeck & Heyse, 1999a, p. 159), (Kauffeld, 2003, pp. 178-188)). Franke suggests a competence model that exists of four competence aspects that result in professional action competence. Professional competences are closely work-related skills and knowledge, generating solutions to organizational problems. Methodological competences are mostly cognitive skills for structuring problems and decision making. Social competences are the abilities to communicate and coordinate for achieving goals successfully in social interaction. Finally, self-competences refer to self-assessment and creation of situations that allow an individual's development (Franke, 2005, p. 34).

Baitsch and Frei (Baitsch & Frei, 1980, pp. 31-33) suggest a model that describes competences along three dimensions. Although the model was originally developed to describe qualifications, Goetze adapted it to describe competences and key competences (Goetze, 2001, p. 29). The dimensions are called extension, intension, and reflection. It also permits the discrimination between competences and key competences. A competence's extension is the number and width of tasks in which the competence is used. If a competence is applied in many areas of daily life and work life it has a high degree of extension (Baitsch & Frei, 1980, pp. 32). A competence's intention describes to what degree a competence can be employed to reach personal goals. These goals can also be collective goals of a group. Reflection makes a statement about the consciousness of competences and how consciously the competences are generated (in (Goetze, 2001, pp. 59-60). According to this model, competences have lower values on the intension level than key competences.

By far the most elaborate conceptualization of competences is provided by Erpenbeck and von Rosenstiel. They translate the idea of self-organization into the area of competences. Although, based upon the theoretical framework, Synergetics itself is not the prominent feature of this approach. The benefit of their conceptualization lies in the systematic composition of a taxonomy in which competences can be integrated (Erpenbeck & Rosenstiel, 2003, p.XV). It presents four categories of competences: professional-methodological competences, social-communicative competences, personal competences, and action competences (Erpenbeck & Rosenstiel, 2003, p. XVII). Unlike the previous described models that have distinct categories of professional

competences and methodological competences, both categories are integrated into one. The action competences are described as an equal category. They do not result from the interaction of other competence classes (compare (Erpenbeck & Heyse, 1999a, p. 159)).

Competences are understood as dispositions for self-organization - anlages, tendencies, and abilities to act creatively and in a self-organized manner. These dispositions are employed to deal with diffuse or lacking goals and manage a high degree of uncertainty. This applies to the levels of individuals, teams, companies, organization, and regions (Heyse, Erpenbeck, & Michel, 2002, p. 11). Competences are both goal-oriented and subject-oriented (focused on an individual). The goal-orientation points out, that competences are utilized in order to reach a certain goal. In this sense, it is comparable to Dörner's epistemic competence, which describes an individual's ability to estimate the probability of success of their own behavior (Dörner, 1989, p. 445). The subject orientation emphasizes the focus on the individual and its dispositions which carry out the competences. Qualifications focus more on the result of an action, that can be objectively evaluated (Arnold & Schüssler, 2001, p. 55).

Competence Types

Competences are nowadays regarded important in decision making and problem solution processes. Under-defined situations and intertwined processes require self-organization of one's own behavior when there is no pre-defined path to follow. To manage these situations problem-solving strategies are applied. Two competence types (strategies) are distinguished: the gradient strategy and the evolution strategy. Both strategies act on the assumption of a continuing search in a space of problems and solution variants and that intermediate solutions are continuously evaluated. Both are described in the following.

Gradient Strategy   The gradient strategy is a search mechanism assuming there is a fast solution path to a uniquely defined optimum. The goal is assumed to be known although it may be scarcely defined. The single steps leading to the solution are optimized over time aiming to improve the solution gradient. During the process the uncertainness decreases when coming closer to the solution. This procedure is called self-regulating strategy (Ridder et al., 2004, p. 56). This process is self-regulated when a person determines learning targets, operations and strategies, and monitoring processes. If these components are set by an external person (e.g. teacher, trainer) the process is externally controlled (Erpenbeck & Heyse, 1999a, p. 130).

By pursuing a gradient strategy only those search steps for the solution are conducted that promise a fast approximation to the goal. This strategy produces good solutions for small search spaces but with increase of the search space the found solution may prove not to be the optimum. Following this strategy demands the professional-methodological competences over the personal competences, the social-communicative competences and the action-oriented competences (Erpenbeck & Rosenstiel, 2003, p. XIV). The gradient strategy is to be employed when there are defined goals and methods to reach them (Erpenbeck, 1999, p. 2).

Evolution Strategy The gradient strategy is not applicable to problem situations with several possible solutions and optima which may even change in the run. Evolution strategies have to be applied in such situations when final goals are often unknown at the beginning of a process and are generated throughout this process (Erpenbeck & Heyse, 1999b, p. 11). Important elements of this strategy are the reproduction of previously successful solutions, adapting those solutions to the given situation and creating new solution paths. This is called a self-organization strategy (Ridder et al., 2004, p. 56). As a consequence, self-organization leads to enlarging the prevailing dispositions (Erpenbeck & Sauer, 2001, p. 44).

Such a process can also be started and controlled by an external person. In this case, an individual is given tasks and put into a situation which can not be solved with existing strategies and control processes. This triggers a self-organization process. Considering this, external control always builds upon self-organization of an individual (Erpenbeck & Heyse, 1999a, p. 130).

Evolutions require destabilization and reappraisal of existing solutions and procedures. Gained solutions may have to be left and intermediate impairment has to be accepted. Following this strategy demands personal competences, social-communicative competences and action-oriented competences over the professional-methodological competences. They are necessary but not sufficient (Erpenbeck & Rosenstiel, 2003, p. XV). The evolution strategy is characterized by a high degree of insecurity regarding decisions and actions. Values provide a guideline along which decisions and actions can be exerted, and, thus, can serve as an order parameter (Erpenbeck & Heyse, 1999b, p. 24), (Erpenbeck & Sauer, 2001, p. 44).

Realistic learning situations are thought of to be a mixture of self-direction, external direction, self-organization, and external organization (Heyse et al., 2002, p. 13). For the development of competence trainings, the percentage of each type should be defined. But it has to be remarked, that the full discrimination between the four learning types is of inferior benefit for hands-on issues. The categorization is more important for conceptual considerations (Erpenbeck & Heyse, 1999b, p. 19).

Competence Classes

The model by Erpenbeck and von Rosenstiel comprises four competence classes. Personal competences refer reflexively to the acting person. Professional-methodological competences refer to professional (work) environments and changing them. Social-communicative competences refer to the actor's social environment and, finally, action competences are characterized by action and volition components (Erpenbeck & Rosenstiel, 2003, p. XV). In earlier conceptualizations, professional competences and methodological competences were distinct categories (Erpenbeck & Heyse, 1999a, p. 159), but later they were integrated into one competence class. The four competence classes, often referred to as key competences (see page 68), represent a schema, in which the competences are clustered according to their object of reference (see table 3.1).

Competence Class	Object of Reference
Personal Competences	Self-organized actions refer to the acting individual
Professional-Methodological Competences	Self-organized actions refers to the representational environment (tools, objects) and changing this environment
Social-Communicative Competences	Self-organized actions refer to social environment (individuals or groups)
Action Competences	Self-organized actions, characterized by activities and volitional elements

Table 3.1: Competence Classes

Personal Competences   Personal competences are all dispositions of an individual that allow to act in a self-reflecting manner. They help to analyze one's own behavior in order to align it according to personal goals (Erpenbeck & Sauer, 2001, p. 26). This means developing productive attitudes, values, motives and self-concepts, appraising oneself, unfolding motivations and talents, developing creatively in a work context and private life, and learning (North & Reinhardt, 2005, p. 42), (Erpenbeck & Rosenstiel, 2003, p. XVI). Whenever self-organized acting reflects to the acting person, the actions mirror personal competences (Erpenbeck & Rosenstiel, 2003, p. XV). The competences in this class are highly subjective. An appropriate evaluation may only be possible in combination with the assessment of professional competences (Bernien, 1997, p. 34).

Professional-Methodological Competences   These competences are dispositions to act self-organized mentally and physically when solving factual and tangible problems. The actions of an individual refer to the objective environment (Erpenbeck & Rosenstiel, 2003, p. XV). This includes solving problems creatively with professional knowledge, skills, and abilities, classifying and assessing knowledge, and advancing methods oneself. They comprise work-specific abilities, skills, and knowledge. The facet of methodological competences includes the ability to make use of acquired professional competences in a goal-oriented manner, as well as the ability to further develop these methods (Erpenbeck & Rosenstiel, 2003, p. XVI). This facet is considered independent of the task by some authors and they are thought to be of higher endurance (North & Reinhardt, 2005, p. 44).

Social-Communicative Competences   This group of competences summarizes an individual's dispositions to act self-organized communicatively and cooperatively, to establish social relations and processes between individuals, within a group or organization (North & Reinhardt, 2005, p. 47). This incorporates developing plans, tasks, and goals, as well as dealing with

others in a positive way, and acting positively for group goals (Erpenbeck & Rosenstiel, 2003, p. XVI). Social-communicative competences are reflected in a person's actions with the social environment (Erpenbeck & Rosenstiel, 2003, p. XV).

Action Competences This class of competences describes the dispositions of an individual to act actively and holistically. Also, they support acting according to intentions and plans. Activity and volition components are involved (Erpenbeck & Rosenstiel, 2003, p. XV). This comprises the abilities to integrate emotions, motivations, abilities and experiences (Erpenbeck & Rosenstiel, 2003, p. XVI). For this group of competences it is important to note that traditional school-like methods can not be applied to develop them (Hartmann, 1999, p. 24). Action competences prove in acting. To assess it, situations have to be created that simulate a context in which an individual has to act out acquired competences. If the situation is successfully coped with the individual can be considered competent (Hanft & Müskens, 2003a, p. 60).

Minnameier remarks that the term self-organization is sometimes used in a careless manner and without a concise definition. Especially, the dispositions for self-organization focus more on the results that are generated throughout the process of self-organization. The focus on the process characteristics themselves (Minnameier, 2003, p. 10), (Erpenbeck & Heyse, 1999a, p. 130). Also, the differentiation between self-organization and self-regulation (self-direction) is not concisely used. Thus, talking of self-organization strategies (North & Reinhardt, 2005, p. 35) is misleading since it implies a set goal that is followed upon.

3.2 Related Concepts

Competence is a concept that is lacking a clear, distinctive definition throughout literature. Various terms and definitions are compounded, leaving the reader confused about the definitional context of each term. Terms are partly used synonymously, partly contradictorily (Erpenbeck & Heyse, 1996, p. 31). For clarifying and specifying the concept competence, related concepts are described in the following section. They demonstrate the definitional proximity but also the differences.

In total, five related concepts are presented. The first four concepts, qualification, key qualification, key competence, and metacompetence are closely related to competence and frequently discussed in competence literature. They are often referred to in education and employment policies, as they are important for designing advanced training and promoting competence development. The fifth concept is less closely connected to the competence discussion. The concept resource is strongly connected to solution-oriented counseling and psychotherapy.

3.2.1 Qualification

In Germany, qualification (German: Qualifikation) describes a person's tested and certified level of skills or abilities which were acquired in school or further training (Messerschmidt & Grebe,

2003, p. 53). This training and the respective certified qualification are the prerequisite to be admitted to a qualified job position (B. Bergmann, 2001, p. 1). This shows the close relation between the requirements derived from a task and the mental disposition of an individual (Minnameier, 2003, p. 2), since it includes abilities and skills necessary to accomplish a specific task that the person is trained for. In the late 19th century, qualifications served as a proof of eligibility. Formal qualifications became more important throughout time and showed the degree of an employee's abilities. It can be assumed that self-organized learning and learning on-the-job has always been part of vocational training to some degree but these ways of learning have received little attention or reflection in the past (S. J. Schmidt, 2003, p. 82). In earlier times, just as today, qualifications are derived from objective requirements of a work task and individuals can be assessed how well they meet them (Kaiser, 1998, p. 199). As such they are task-oriented rather than subject-oriented (Schiersmann, 2007, p. 46).

There is discordance about the nature of the constituents of qualification. According to Goetze (Goetze, 2001, p. 56), a qualification is a bundle of competences, North and Reinhardt only consider abilities (North & Reinhardt, 2005, p. 29), whereas Erpenbeck and Rosenstiel consider knowledge, abilities, and skills (Erpenbeck & Rosenstiel, 2003, p. XXIX). In order to certify those base components as qualifications they have to be tested and certified by an adequate institution e.g. by the chamber of commerce and industry, which issues a diploma or a certificate. Thus, they have been officially recognized and accredited. This shows that learning in schools or vocational training is more important for qualifications than learning on-the-job (Volkholz & Köchling, 2001, p. 382).

Constrasting qualification and competence   Often, the terms qualification and competence are used interchangeably (Arnold, 2001, p. 273) which causes inconsistent use of the terms. Therefore, a differentiation between both concepts is given in the following.

One important difference between qualifications and competences is certification. Qualifications reflect learned content acquired in seminars and further education programs which is officially tested. However, competences are mainly acquired in unstructured learning processes and informal situations. As such, they are not certified (Weiß, 1999, p. 433).

Further distinctions between both concepts refer to the requirement profile, transparency, and problem solving strategies. Qualifications provide abilities and skills needed to face known and structured job requirements. Competences center on unstructured and changing requirements which require the self-organized and short-term adaptation to the new emerging situation (E. A. Hartmann & Rosenstiel, 2004, p. 15). With respect to transparency, qualifications are directly measurable, whereas competences are not. When applying qualifications it is implicitly assumed that the action's goal is known. Qualifications imply the gradient strategy. Competences, however, allow a searching process that is started in situations with multiple possible solutions. The final solution is unknown and is a result of the searching process. Such a constellation demands an evolution strategy (Martens & Nachtigall, 2006, p. 120).

Qualifications describe the necessary knowledge and abilities for a specific task. They can

be described independent of an individual. In contrast to competences, qualification focuses less on personal developments but it reflects the societal need by fulfilling work-related tasks (Erpenbeck & Heyse, 1996, p. 33). Competences look at an individual's dispositions, and thus, they are subject-centered. They describe the strategies or solution algorithms an individual has (Kaiser, 1998, p. 199). Additionally, competences emphasize on a holistic perspective and mental components by considering the cognitive, emotional, motivational aspects of acting (Erpenbeck & Heyse, 1996, p. 35).

Qualification	Competence
formal learning setting	informal learning settings
gradient strategy	evolution strategy
certification normal	certification unusual
directly measurable	indirectly measurable
analytic	holistic approach
task-centered	subject-centered
self-regulation	self-organization

Table 3.2: Comparison of Qualification and Competence

Companies have turned away from considering knowledge transfer as the main instrument to face today's economic challenges. This shift is associated with a general change of perspective from qualification to competence. In times of rapid economical changes, the description of needed qualifications for given work tasks is more difficult, as the change of requirements has become more unpredictable (Schiersmann, 2007, p. 50). This shift is considered crucial for successful acting in increasing dynamics, complexity, and lacking predictability of political and economical processes (Erpenbeck & Sauer, 2001, p. 26). Learning processes are cumulatively integrated into the working process (Reuther et al., 2004, p. 12). Although, the appropriate formal qualification is becoming more and more important in many European countries (Dybowski, 1999, p. 5) this is not considered sufficient for a life-time job. Life-long learning and further training is becoming necessary (B. Bergmann, 2001, p. 1), and competences are considered to describe and master this challenge more comprehensively than qualifications can (Henning, 2001, p. 65).

The narrow definition of qualification as described above was softened in the 1980s when process-independent qualifications were defined which are independent of production processes. Highly specialized knowledge now is considered obstructive. Learning to learn and a broad basis of abilities and knowledge is emphasized. This leads the discussion to key qualifications and later on to the consideration of competences (Behrens, Ciupke, & Reichling, 2003, pp. 292-293).

3.2.2 Key Qualification

In the 1970s, it was stated that changed requirements and increasingly heterogeneous work environments demand turning away from the concept of qualification to "key qualification" (Minnameier, 2003, p. 3). Demands of a new, different qualitative nature were placed upon employees which could not be met by being qualified alone. Thus, key qualifications were introduced which were thought to describe this phenomenon more adequately (Bernien, 1997, p. 26).

Key qualifications comprise abilities, skills, and knowledge which are not needed to fulfill a defined task or activity (like qualifications) but to master a sequence of unknown changes and demands (Mertens, 1988, p. 39). According to Mertens, key qualifications are superior qualifications that allow individuals to acquire new knowledge and qualifications needed in specific situations (Mertens, 1974, p. 36). Furthermore, they comprehend all the necessary skills and abilities to identify unknown demands of a specific work environment and task structure (Henkel & Schwarz, 2003, p. 59). This understanding of key qualifications was not entirely new in the 1970s, as Mertens points out: In ancient times, there were elocution and strategy, and there was scholastic knowledge in the Middle Ages, to name a few (Mertens, 1988, pp. 39-40). Reading, writing, and calculating are considered modern key qualifications (Henkel & Schwarz, 2003, p. 59). For university education presentation competences, communication competences, and foreign language acquisition is named (Schiersmann, 2005, p. 146). In this context, the usage of the terms key qualification and competence is not selective.

Key qualifications are distinguished into four categories: basis qualifications (logical thinking and learning), horizontal qualifications (information about information, managing media), breadth elements (knowledge applicable to many areas, like machine maintenance, occupational safety), and vintage qualifications (qualifications that level out generational differences) (Henkel & Schwarz, 2003, p. 60). But this categorization has not proven useful, and has not been further followed up (Schiersmann, 2007, p. 49).

One important function of using "key" seems to be of a communicative nature: its usage creates consent between different political parties like employers, employees, labor unions, and pressure groups when arguing about vocational training. It seems to reduce conflicts as long as the definition stays vaguely and they seem to create a common understanding (Mertens, 1988, p. 37). Each additional specification of the nature of the vocational trainings endangers the consent between the involved parties (Geißler & Orthey, 1993, p. 40).

In other countries, there are comparable developments of defining key qualifications. In France they are called "Qualifications-clés", in Great-Britain they are called "core skills" or "key qualifications", and they are named "Generic Skills" or "Habiletes Generiques" in Canada (Mertens, 1988, p. 38).

Compared to key qualification, the concept competence is more comprehensive. It integrates cognitive, social, communicative, motivational, volitional, and action dispositions, whereas key qualification focuses on cognitive aspects. Competences can not be evaluated directly, key qualifications contain restricted knowledge aspects and abilities that can be evaluated easier, and thus,

allow certification (Erpenbeck & Heyse, 1996, p. 36). The discussion about key qualifications is ended when term competence was introduced. It is considered more open as regards to content and broadened by the concept of self-organization (Meyer-Wölfing, 2003, p. 229).

3.2.3 Key Competence

Although there is no clear theoretical or conceptual difference between the concept of competences and the concept of key competence (Rychen, 2003)[p. 64], its use has become popular in enterprises and the associated research areas. In 2001, Weinert reports about 650 key competences which were mentioned in German literature; alone in the area of occupational training (Weinert, 2001). If the specification of the term competence by putting the word *key* in front of it is supposed to have any meaning or even utility, its intention needs to be further specified. The term suggests that it describes important or essential competences (Lang-von Wins, 2003). This intention is revealed when considering the synonyms of *key* in its adjectival usage: it means either "important" or "fundamental" (Rychen, 2003), (Rychen & Salganik, 2003). According to this understanding, key competences can be considered as high-order competences (Goetze, 2001, p. 57).

The concept has become popular since it is multifunctional and contextually independent from the inherent purpose institution and task. This requires key competences to be abstract constructs which need to be broken down into subcompetences. This breaking down of competences allows operationalizing competences and they become accessible to evaluation. The introduction of key competences over competences helps in reducing complexity (Rychen, 2003, p. 74) by applying a limited number of key competences instead of many diverse competences (Weinert, 2001). Key competences - like competences - are compositions of skills, attitudes, motivation, emotions, and other social components (Rychen & Salganik, 2003, p. 54). Also, they are considered important to all individuals and they are applied for meeting complex challenges that are highly valued (Rychen, 2003, p. 67).

Two conceptualizations of key competences shall be mentioned: Rychen suggests a set of three key competences (Rychen, 2003, pp.85-107). Interacting in socially heterogeneous groups, acting autonomously, and using tools interactively. Each of these key competences comprises a set of competences which determine the conceptual framework of each key competence.

- **Interacting in socially heterogeneous groups** focuses on the interaction of an individual with others, dealing with social diversity, social awareness, cooperation, and competition. The three constituting competences are: relating well to others, cooperating, and managing and resolving conflict.

- **Acting autonomously** describes acting according to one's own goals and criteria in social contexts. Individuals need to develop competences to play an active and responsible part in a given context, expressing own ideas and exercising rights. This involves defining oneself and developing a personal identity. Autonomy requires awareness of one's environment

to develop a future-oriented plan which can be acted out soundly. Three competences are subsumed in this key competence: acting within the larger context, forming and conducting life plans and personal projects, and defending and asserting one's rights, interests, limits, and needs.

- **Using tools interactively** refers to using physical tools (machines, computers) and social-cultural tools (language, information, knowledge). The interactive usage of a tool assumes a familiarity with the tool itself and an understanding of how this interaction influences an individual's interaction with the world and how it can be applied to reach broader goals. This key competences comprises following competences: using language, symbols, and text interactively, using knowledge and information interactively, and using technology interactively.

The second conceptualization of key competences is the competence model by Erpenbeck and Rosenstiel presented above (compare section 3.1.3). The four classes Personal Competences, Action Competences, Professional-Methodical Competences, and Social-Communicative Competences are often considered as key competences (Scharnhorst & Ebeling, 2006, p. 26), (Erpenbeck & Rosenstiel, 2003). This model also demonstrates the abstract character of key competences whose complexity is divided into several single competences. The discrimination between competences and key competences may not be an easy task but in everyday life and for practical use this differentiation may not be of any relevance in the first place, as Goetze argues (Goetze, 2001, p. 58).

3.2.4 Metacompetence

Next to key competences, metacompetences need to be differentiated from competences. *Meta* (Greek, meaning 'after', 'beyond', 'with') is a prefix used to indicate that a concept is an abstraction of another concept, used to complete or add to the latter. In epistemology, *meta* means "about". There are several established concepts that use meta in this sense: metadata (data about data, e.g. name of author, volume, ISBN of a publication) (Gilliland-Swetland, 1998), metacognition (knowledge about the functioning of one's own cognitive system (Gage & Berliner, 1996, p. 321), metamemory (knowledge about organization and representation of memory content, also knowledge about its capacity and limitations (Mähler & Hasselhorn, 2001), (Flavell & Wellman, 1977), and metaknowledge (knowledge about knowledge).

The idea of self-organization is strongly reflected in the concept of metacompetences. They are considered as second-order dispositions of self-organization. Metacompetences enable individuals to develop competences which are defined as disposition for self-organization (Erpenbeck, 2006, p. 9). They are called universal or absolute competences which refers to their independency of context and time (G. Bergmann et al., 2004, p. 110).

Understanding metacompetence as the ability to adequately assess the availability, potential benefit and learnability of competences (North et al., 2006, p. 155) has major implications for

understanding and supporting competence development. They refer to knowledge, motivational attributions and volitions that help to put cognitive resources of various tasks and different application areas for different purposes and goals into action (Ridder et al., 2004). Following examples of metacompetences are mentioned: learning competence (North et al., 2006, p. 157), competence for self-organization (Erpenbeck, 2003, p. 64), and action competence (Messerschmidt & Grebe, 2005, p. 48). Learning competence contains the ability to organize learning processes irregardless of the content (North et al., 2006, p. 157). The competence for self-organization and action competence are good examples for the difficult differentiation of metacompetences and key competences. The distinction is not precise throughout literature since both are considered to be competence-generating (Goetze, 2001, p. 57).

Metacompetences can be defined for two different levels, as it is possible for competences in general (see page 59): the individual level and the level of social groups. It can be understood as a characteristic of a social group in which lacking competences are developed within the group by the group's inherent self-organization competences (North & Friedrich, n.d., p. 6).

Four approaches (G. Bergmann et al., 2004, pp. 111-115) can be distinguished to understand the phenomenon of metacompetence:

- **Meta-systemic competences as metacompetence** Metacompetence as an ability independent of situations or individuals describes an ability beyond the regular competences. Thus, metacompetences are meta-systemic attributes. A metacompetent individual is able to be aware of unconscious emotions and internal drives. As well, different perspectives can be adopted. This involves the self-concept of one's own abilities and judgment of the situation one is in (Erpenbeck, 2004, p.5).

- **Metacompetence as wisdom** Wisdom is a characteristic of an individual who owns an outstanding expert knowledge. This involves declarative and procedural knowledge, knowing different life contexts, unpredictability, and differences of values and priorities. Some of these aspects are covered by facets of Generic Principle 3 (see page 43) and dimension 2 of the construct systems competence (see page 35).

- **Metacompetence as developing competence development** This describes the reflection of learning individuals over their own competence development. This may be supported by the aid of a mentor or coach.

- **Metacompetence as universal ability for problem solving** If a metacompetence is considered as a universal problem solving ability, then it is defined as a general ability to develop abilities for every emerging situation on demand.

Irregardless of the perspective on metacompetence, a number of characteristics can be listed which describe the meta-competent actor, as there are: self-distance, empathy, xenophily, identification of situations and phases, enjoying to intervene and act (G. Bergmann et al., 2004, pp. 116-118).

3.2.5 Resource

Resources are the whole ensemble of acquired abilities and knowledge, mindsets and attitudes that were adopted throughout a learning processes. They constitute an individuals potential to perform competently (Goetze, 2001, p. 56) and they help to achieve an individual's goals (Alpers, 2005, p. 335). This characteristic exemplifies the positive effect of resources. Recognizing resources always sets the focus on one's own possibilities to reach set goals.

From an organizational perspective resources can be understood as the physical resources (land, buildings, equipment, raw material) and human resources (qualified vs. unqualified work in the technical, managerial, and administrative sector) of an organization. Also, the term can be applied to describe the organization-specific strengths and weaknesses applicable for maximizing profit. Resources do not directly account for the organization's success. They have to be put into action first (Ridder et al., 2004, pp. 24-26).

Resource orientation is the belief that each person has the necessary strengths and abilities to overcome burdens and problems. Counseling supports the process of activating such resources and receives attention in counseling trainings (Alpers, 2005, p. 334). A strong resource orientation can be equated with a competence orientation since the focus is on existing competences not on missing ones. But it has to be mentioned that a competence oriented view does not necessarily have to be resource oriented. A competence profile of an employee may also show the lack or insufficient degree of competences (Aulerich et al., 2005, p. 49).

At last, the meaning of resources/competences for mental health shall be pointed out.For example, low social competences, like low sensitivity for the behavior or sensation of others, or the inability to express needs in a socially accepted way are characteristic for people with mental disorders. One way to prevent mental disorders is to train resources and competences in this area (Reinecker & Petermann, 2005, pp. 264-266).

Sometimes, the constituents of competences are appointed as combinations of resources instead of dispositions that are aimed to be utilized in a particular context (Goetze, 2001, p. 56). By doing so, the generating, helpful character for realizing competence is emphasized.

3.3 Competence Development

After presenting competence and its related concepts in the previous sections, attributes and characteristics of competence development are described in the following. Questions of competence levels and arranging learning settings are addressed, as well as the relation between competence and performance. The impact of reflecting one's own behavior on the competence development is discussed and the difficulties of competence certification is considered.

Simply put, competence development is the acquisition of competences. Next to this, competences also can be enhanced, restructured or updated. As the term *development* indicates, competence development is a process and happens over time (Erpenbeck & Heyse, 1996, p. 32).

Just like competences, competence development can be described on different layers (see page 59 and (Lompscher, 2003, p. 54)).

Changing environments demand the adaptation to these changes to assure successful behavior. Therefore, competence development is an ongoing process and an inherent part of personality development and has to be reflected from a life-span perspective (Trier et al., 2001, p. 88). Also, it describes the learning of individuals or teams apart from schools, vocational trainings, and universities (Aulerich, 2003, p. 7). The life-long conception of competence development is characterized by continuity and discontinuity depending on environmental factors like economical and social changes, resignation, and changes of interest (Trier et al., 2001, pp. 88-94). At a certain point, an individual's cognitive system has to adapt to maintain its performance level. Therefore, a gain in competence can be considered as the change to a higher cognitive level. A person who is not able to follow this can not solve upcoming problems or attend to them adequately, and remains incompetent for a given task (Minnameier, 2003, p. 8). Competence development is a discontinuous process, resulting from the succession of various competence levels that are mastered over time. The phenomenon of discontinuous developments are known in the area of collective behavior (Mayntz, 1988, p. 21), (Schiepek et al., 2000, p. 173). Applying Synergetics to the area of competences (Minnameier, 2003, p. 6), (Erpenbeck & Heyse, 1999a, pp. 136-145), this observation meets the concepts of control parameters whose incremental change ends in radical changes (compare section 2.1.2). Considering competence development as a whole, it may appear as a continuous process but this is a result of viewing it from a superior level that gives that impression (Minnameier, 2003, p. 9) .

Understanding competence development and the relevant interrelations can be described with the means of Synergetics (Minnameier, 2003, p. 5). The communication and action which is conducted in a self-organized manner is based on internal dispositions. An individual is seen as a closed system that takes on impulses from the environment. The internal structures of an individual are originated from intra-systemic states. Competence development is a process of self-learning that can not be directly influenced from outside (Pfadenhauer, 2004, pp. 283-284). An individual resides in a stable state with a certain set of competences in a certain order. Incoming information is assimilated to maintain the system's prevailing structure. With critical information or a critical amount of information the system can not maintain its structure and reorganizes its constituents on a different level. As a result a new order emerges. This may involve unlearning rules and behavior, maybe even changing values and convictions (Erpenbeck, 2003, p. 22). This change into a new direction without well-defined outcome can be seen as an order transition. The development is influenced by values and norms, which again can be of internal or external nature (Erpenbeck, 1999, p. 3).

In the long term, continuous competence development secures employability of the individual. For an organization, there are competitive advantages by achieving a higher flexibility of its staff members (Frieling, Schäfer, Fölsch, & Hingst, 2006, p. 1). Employers can influence the competence development by providing high incentives for learning. Little learning stimulation may degrade an employee's competence and, thus, decrease employability for the future (B. Bergmann, n.d., p. 7). The necessity of learning is the result of changing work environments

due to globalization, scientific-technological inventions, and an increasing degree of automatization (Vester, 2000, p. 185). Further factors for prompting learning are e.g. less and varied need for human work force than in the past, societal and political changes. Changed environments are followed by changed work tasks which increase the pressure on individuals for learning (Götz, Hartmann, & Weber, 2003, pp. 33-34). If these raised expectations on individuals for constant learning and developing are not met by the actual evolution of the employees, the competence development is endangered. As mentioned above, learning on the job is thought to be effective. But this only holds true when certain prerequisites are followed, like sufficient time and adequate support to master the manifold learning requirements accompanying a higher and broader work intensity (B. Bergmann, 2001, p. 2).

3.3.1 Representing Competence Development

After presenting the motivation for considering competence development, the following section presents how this process can be described, and what factors there are for supporting this development.

Given objective, reliable, and valid evaluation instruments it is possible to assess competence C_i at any given moment t_0. The competence development over time can be demonstrating by portraying and analyzing time series. This results in illustrating the development of competence C_i from t_0 to any other point in time t_n over a multitude of repeated measures. The time interval between the measures has to be defined by the evaluator. Regarding the length of this interval, three interval lengths can be distinguished: a short-term interval ranges within days or weeks, a middle-term interval ranges from months to years, and a long-term interval ranges from a couple of years to a life span (Erpenbeck & Rosenstiel, 2003, p. CVIII). Independent of the regarded time span, competences can increase, stagnate, or decrease. What course is viewed will mainly depend on the selected time span. The granularity of evaluation points plays an important role (Hübner, 1999, p. 7) (compare the considerations about continuous vs. discontinuous competence development on page 72). As a mathematical formula, the gain in competence is depicted as

$$\Delta_i, k = c_i(t_k) - c_i(t_k - 1)$$

.

Competences develop over time and may even decay, thus, competence development can be negative, like when skills or knowledge are not applied for a length of time (unemployment, sickness). To prevent this, competences have to be maintained and constantly cultivated (Buggenhagen & Heller, 1999, p. 223). They are not statical parameters and although they are bound to an individual they change over time influenced by the surrounding contexts (Flasse & Stieler-Lorenz, 2000, p. 207). Also, the transfer of knowledge and experiences to new areas is associated with competence losses (Weiß, 2001, p. 187).

Regarding the scale level on which competences are measured, there is the overall assumption that they are not measured on nominal scales and, thus, showing if a person is competent or

not: an underlying scale ranging from low to high is assumed and persons vary in the degree of competence (Rychen & Salganik, 2003, p. 49). The determination of the scale level of competences (ordinal scale or interval scale), can be expected to prove difficult as this holds true for many psychological constructs (Bortz, 1993, p. 27).

3.3.2 Supporting Competence Development

These previous thoughts about competence development are based on one fundamental assumption: competences can be learned. But yet they can not be directly taught. Based on a set of innate primary cognitive abilities, competences can be enhanced by providing conditions which allow individuals to develop in a self-organized manner (Trier et al., 2001, p. 97). Providing such learning conditions is important when considering the situations, in which work-related learning takes place. Asking employees directly, there are three ways of learning, that are rated the most valuable: learning from daily life experiences, exchanging experiences with colleagues and supervisors, and learning in a self-organized way (Frieling et al., 2006, p. 6). Self-organized learning is part of further education in working environments. The challenge lies in demonstrating the learning progress. With competence development counseling, a new field is emerging in which the identification of competences is supported and strategies for further development of the competences are considered (Schiersmann, 2010, p. 750). The certification of competence remains open, especially if competences and not qualifications are to be certified (Fischer & Duell, 2003, p. 11).

Transfer competences are important in competence development since it describes the ability to react to changed contexts and requirements. The transfer avoids having to un-learn or re-learn abilities or competences with changing contexts and environments (Wittwer & Witthaus, 2001, p. 6). Teaching this flexibility is difficult, though. It has to be experienced, tried out, and developed (Wittwer, 1999, p. 12).

In order to implement competence development, several methods can be applied: exchange programs, quality circles, instruction by supervisors, and job rotation are established concepts (Bernien, 1997, p. 36). Further, competence development comprises the following three elements (Frank, 2004, p. 9):

- **Training - the classic way**. Trainings, adapted to a target group and specific learning goals, follow the approach of direct knowledge transfer, including feedback mechanisms. The faster knowledge decays the more there is a focus on teaching learning methods to acquire, qualify, and unlearn knowledge instead of pure knowledge transfer (Arnold & Lermen, 2003, p. 25).

- **Conducive learning environments**. Structural aspects of organizations - as there are rules, procedures, and functionalities - can support the competence development of its members. The more incitement, stimulation, and challenges there are for the employees the higher is the probability of improved abilities and skills.

- **On-the-job learning**. On-the-job learning describes the acquisition of competences, abilities, and skills while the employee is working. Competence development, especially, happens on the job to a high degree. Conducive environments and impulses by trainings facilitate learning on-the-job. But offering new learning content alone may not be stimulating enough to trigger learning readiness. Profiling, meaning to capture an employee's competences is thought to provide a basis for reflection and initiate a learning process.

Knowledge is one component of a competence, and as such, considered a crucial factor in competence development which can not be abstained from. But two aspects have to be kept in mind: First, the traditional way of pure knowledge transfer is necessary but not enough to develop competences. Competences have to be acted out. Thus, action competence has to be developed in parallel to the other types of competences (Hartmann, 1999, p. 24). Second, it has to be remembered that knowledge is always taught with a time-lag. Up-to-date knowledge has to be transfered into curricula before it can be communicated in trainings. In times of fast changing environments this lag may be too long and the knowledge partly obsolete (Staudt & Kley, 2001, p. 232). Informal learning, as on-the-job learning, is regarded as dominating over other learning types (Erpenbeck & Rosenstiel, 2003, p. XII). It is not a new phenomenon; employees always have been learning in an informal manner. Due to the current environmental developments it receives more public attention than it used to (Faust & Holm, 2001, p. 92). Thereby, formal learning is taking place in some institutions of learning with the goal of certification. Learning apart from such institutions is considered as informal learning (Heyse et al., 2002, p. 12).

3.3.3 Learning Settings

The traditional vocational training setting have been classic trainings and school-like learning for a long time. In the past 10 - 15 years, different learning settings have been favored which are thought to be more effective. But it has to be remarked that the shift of orientation to a learning on-the-job may be more cost-related than openly admitted (Schiersmann & Remmele, 2002, p. 7), (Friedrichs, 2003). Although, there are indicators that suggest that the return on investment is higher with learning on the job (Erpenbeck & Sauer, 2001, p. 294). But this calculation assumes that the investment into human resources and the outcome can be quantified which is strongly doubted (Zimmermann, 2006, p. 4). Ideally, though, a combination of formal and informal learning forms should be aimed for (Schiersmann & Remmele, 2002, p. 24), (Faust & Holm, 2001, p. 68). Irregardless of ulterior reasons shifting the focus from school-like learning to learning on the job, a study shows that adults rate their learning gains the highest at daily work or when exchanging information with co-workers (Baethge & Baethge-Kinsky, 2002, p. 134). The gain in knowledge when visiting an educational institution is regarded lower (Baethge & Baethge-Kinsky, 2002, p. 81).

Although these realistic learning situations are preferred by the employees, they have a number of problems which have to be mentioned, as there are: time pressure, varying participation, development of different learning speeds, different knowledge levels, as well as inflexibility

of formal education to fast technological developments (Schiersmann, 2007, p. 26). Also, since competence training is time consuming, the upkeep of the motivation proves to be difficult (Burow & Hinz, 2003, p. 487).

There is one more argument for informal learning settings: Competence development requires open learning scenarios in which individuals are confronted with complex situations with an ample variability. Strongly partialized work tasks that only require a limited number of easy activities have a dysfunctional impact on competence development and personality development (Frieling, Bernard, Bigalk, & Müller, 2001, p. 114). Such complex situations require decision making and handling the consequences in intransparent scenarios which is an example of acquiring methodological competences rather than knowledge (Arnold, 2001, p. 284).

Lastly, it shall be remarked that relevant competences for work activities can not only be acquired in work-related processes or trainings. Important competences also may be learned in voluntary associations (Tier, Baltin, Bröderl, Busch, & Flachmeyer, 2003, p. 52 + 61), in familial settings (Hartmann, 1999, p. 26), or even computer games (Gebel, Gurt, & Wagner, 2004). Paying more attention to competences acquired outside the work processes and reflecting them will help to transfer competences from one area to another. As well, start-up companies are found to be an excellent learning situation for competences. The lesser degree of formal organization and division of work puts many activities on few employees. The high interaction and communication rate offers many learning chances to develop competences (Voigt, Weißbach, Böhm, & Röcken, 2005, p. 10).

3.3.4 Reflection

For competence development, systematic and continuous reflection is considered important in competence transfer besides promoting self-organized learning. Both ways help becoming conscious about one's own learning process and convey responsibility for one's own development (Straka, 2001, p. 165). Competence development happens during work-related activities to a high degree which only allow a limited possibility for reflecting during this informal learning process.

Informal learning can be characterized by two dimensions. First, the degree of integration of working and learning, and second, the awareness of learning. Informal learning is located in the middle of both dimensions, framed by non-intentional learning and formal learning. Non-intentional is described by a high integration of working and learning and a low awareness of the learning process, whereas formal learning is characterized by a low integration - learning happens distinct from work - and, thus, a high awareness of learning (Staudt & Kley, 2001, p. 239). The lower the awareness of learning, the more the impression made during such a process resembles sheer experiences, which are focused on problem-solving and mastering work tasks (Dehnbostel, 2001, p. 84). Making these experiences conscious by reflection is needed in order to receive tangible learning result and assess the consequences of one's own behavior which in return can be actively utilized by employees (Staudt & Kley, 2001, p. 241). The gained knowledge is called experiential knowledge.

Reflection in this regard describes the conscious monitoring and critical rating of work processes and alternatives to choose from on the basis of one's own experiences, norms, and values (Franke, 2005, p. 55). Experiential knowledge is located between implicit and explicit knowledge. It is silent knowledge at first, but - in principle - can be made explicit and documented (Staudt & Kley, 2001, p. 236). Thus, reflection is an important transversal feature in the conception of competences (Rychen & Salganik, 2003, p. 82). It elicits the internal structure of a competence and scrutinizes how it was gained. External coaches or counselors can support the process of reflecting (Fischer & Duell, 2003, p. 8). To achieve this, communication about observed differences between self-perception and the ratings of others is an important means (Reuther et al., 2004, p. 61).

3.3.5 Performance

For behaving competently, competence has to be transfered into action and becomes visible as behavior - called performance (Kaiser, 1998, p. 199). This performance (actions, behaviors, choices) can be observed and measured. Every performance is embedded into a context with specific characteristics. As a consequence, there is no deterministic but a probabilistic correlation between competence and performance. Thus, competences correspond with an individual's potential to act successfully in a given context. By defining action competences, the conflict between competence and performance is reduced since competent behavior includes successful actions. It remains unclear from what kind of change in performance a higher state in competence can be assumed. Evidence of competence is strengthened when multiple observers come to comparable observations and conclusions (Rychen & Salganik, 2003, p. 48). Differences in the ratings occur due to different interpretations of the observed behavior or observation biases (Kaiser, 1998, p. 201).

Concluding from performance to competence is even more complicated when considering that some competence constituents are rather stable, other constituents, however, can change quite fast (Franke, 2005, pp. 46-47). This has major implications on the presentation of competence levels. Competences can be described by different levels, but this neglects the facts of competence components and their differing stability. A competence profile lists a competence's constituents, e.g. subcompetences and their extent. Considering this, it is suggested to use competence profiles over competence levels for describing an individual's performance (Franke, 2005, p. 47). For certain work environments and tasks, not all of an individual's competences may be equally important. The mixture of available competences and their differing weight can be reflected in personal competence portfolios (North & Reinhardt, 2005, p. 41). Expertise models are quite popular in practice, showing different performance levels. The differentiation into the three categories adept, expert, and professional, appears intuitive and meaningful at first sight (North & Reinhardt, 2005, pp. 52-55). A competence profile, nevertheless, has more explanatory power (see for example (Schiersmann, Dauner, & Weber, 2009, pp.153-155).

3.3.6 Certification

The claim of life-long acquisition of competences and self-organized learning is followed by a request of adequate documentation and certification of the acquired competences (Diettrich & Meyer-Menk, 2002, p. 2). A certificate is the superordinate concept for all types of efficiency statements and participation certificates that are issued for successful participation of a training or reaching a qualification level. An inflationary usage of certificates has led to the fact that quality and explanatory power becomes less transparent.

Certificates still strongly certify the possession of knowledge aspects of the certificate holder. Since evaluating knowledge does not necessarily involve acting, this kind of certificate explains little about the actual competence (Hanft & Müskens, 2003b, p. 11), unless realistic assessment scenarios are employed in which action competences have to be shown (Hanft & Müskens, 2003a, p. 64). The value of certificates is rated high by participants. Also, they are considered useful in recruiting new employees (Heyse et al., 2002, p. 55). Employers are interested in widening the information gained from existing degrees, CVs, and certificates by introducing a reference card that informs about the degree of mastery in various skills and abilities (Hundt, 2001, p. 16).

The discussion about life-long learning, work-related qualifications, and competence development has come to a point that it has entered the discussions about collective bargaining policies, at least for the metalworking industry in Germany. There is mutual consent about the importance of these factors and that the development of employees shall be supported. But there is discord about the way competence development is supported and monetarily compensated, or even written down in the collective labor agreements (Siegel, 2004). In the medical domain, ongoing training has been institutionalized. From 2004 on, health professionals are obliged to prove their participation in continuing education, lack of proof results in wage reduction (Pfadenhauer, 2004, p. 255). This is one example for establishing and formalizing a learning culture and constant development of the members of the medical profession. As difficult as the assessment of competences proves at time it is assumed that competence assessment will become more and more an instrument of employee recruitment analogous to qualifications (Erpenbeck, 1999, p.5).

3.4 Competence Assessment

The competence taxonomy suggested by Erpenbeck and Rosenstiel (see section 3.1.3) is the precondition for developing competence models. As any attempt of classifying human sensation and behavior, the categories are not completely selective. But this approach helps to define variables operationalizing competences in order to measure them (Scharnhorst & Ebeling, 2006, p. 27). The attempt to assess competences is confronted with the known problems of measuring human characteristics. On the one side there are the attempts to develop objective tests and evaluation procedures based on the standards of statistics and test theory. This explanatory approach aims to find causal and statistical explanations to predict future behavior of individuals in a given context (Erpenbeck & Rosenstiel, 2003, p. XIX). Following such a research tradition, there is

little self-assessment, but more observation from an objective point of view. On the other side, there are procedures for assessing and describing competences from a subjective point of view focusing less on explaining competences, but more on understanding competences. Quantifying and scaling competences is considered less important, though possible. Self-assessment is treated equally to the assessment by others (Erpenbeck & Rosenstiel, 2003, p. XIX).

Although, there have been many attempts to develop evaluation instruments for different classes of competences, Sarges mentions that most of these instruments do not comply with the necessary psychometric standards (Sarges, 2002, p. 296). Competences can not be measured directly but have to be derived from the realization of their constituent dispositions. The interdisciplinary character (Meyer-Dohm, 2002, p. 41) of this research area allows assessing competences with all the available techniques and methods of the associated research domains which results in four basic approaches for evaluating competences: First, they can be assessed like qualifications, although this neglects their dispositional character. Second, competences can be evaluated with interviews or questionnaires, but the latter are considered methodologically problematic. Third, procedures and constructs of social psychology can assess communicative and personal competences, however, these procedures are also tainted with the problems of subjectivity. Fourth, biographical research and qualitative approaches are thought to be valuable for analyzing competence development (Erpenbeck & Heyse, 1999b, p. 50).

The choice of an evaluation instrument and methodology for competence assessment depends on the occasion of the evaluation. To measure the impact of a training or the competence development, a pre- and a post-test may be sufficient. For judging the competence development over a longer life span in terms of a competence biography, biographical-qualitative analysis has to be combined with status analysis (Erpenbeck & Rosenstiel, 2003, p. VXIII). Qualitative data is valued higher than quantitative data in some contexts (Dehnbostel, 2001, p. 81). The reasons may be, that competences can be captured in their full extension in a biography and that this approach is considered to be able to capture the dispositions themselves rather than their transformation into action (Erpenbeck & Heyse, 1999b, pp. 40-41).

From a scientific point of view the assessment of competence is difficult, it remains conceptually and methodologically arguable. One reason is the inflationary usage of the term competence without having a precise and generally admitted definition. Although the definition of competence categories is necessary for operationalization and validation, the mere distinction into categories may not be enough. A multi-faceted construct like competences needs to be assessed with the wide range of evaluation procedures social sciences provide (Bortz & Döring, 2003). Due to the high level of the current categories that stems from pretension to capture broad fields of activity, the possibility to be able to develop valid evaluation instruments is doubted (Weiß, 2001, p. 186).

Efficient competence trainings have to take into consideration everyday life situations and on-the-job learning. As a consequence, laboratory methods for evaluation are not appropriate, they do not provide the necessary ecological validity and hence lack of prognostic validity (Frey & Balzer, 2003b, p. 155). A plausible approach for evaluation is the confrontation of subjects with work-related situations and tasks (Franke, 2005, p. 57).

Such situations provide realistic testing settings and they can be selected appropriately according to a person's position or function. Using such an approach prevents evaluating the cognitive elements of competences. By observing the subject's behavior, the non-cognitive elements of competences can be identified. As well, by using structured interviews, these components can be made available by reflection over the behavior. Naturally, this requires a minimum level of ability to reflect (Zimmermann, 2006, p. 4). Competences have to be shown. Then, they can be observed, captured, and evaluated (Flasse & Stieler-Lorenz, 2000, p. 212).

Although the concept of competence is considered highly important in human resource development, the consequent assessment of employees is rare (Friedrichs, 2003, p. 44). But the different competence classes are thought to be different with respect to evaluation. North and Reinhardt, who only mention three classes of competences (professional, methodological, social), note that professional and methodological competences are rather simple to evaluate since there are many facts and indicators to measure success. For social competences the indicators are less obvious (North & Reinhardt, 2005, pp. 56-57). Nevertheless, multi-dimensional test instruments are demanded, especially for social competences (Kanning, 2002, p. 162).

3.4.1 Methodological Approaches

Two methodological approaches drive the discussion about competence evaluation: self-assessment and assessment by others. Both approaches are used in evaluation instruments and have specific advantages and disadvantages.

Self-Assessment

The assessment of one's own competences is the easiest and also most economic way to assess competences. (North & Reinhardt, 2005, p. 61). Therefore, this way of evaluation is frequently applied (Kauffeld, 2003, p. 179). The quality and validity of self-ratings depend on the person's ability to make realistic performance ratings of one's strengths and weaknesses (Kauffeld, 2003, p. 179). If the ratings are realistic, then it can be assumed that self-ratings mirror a person's self-evaluation, knowing their own strengths and weaknesses the best (Frey & Balzer, 2003b, p. 155). Considering that reflection is crucial for competence development, self-ratings are a means to activate this reflection process (Sonntag & Schäfer-Rauser, 1983, p. 164). To gain the respective data, questionnaires or interview methods can be applied. Factors that may distort the answers in self-assessments are the tendency to give socially desirable answers, (Mummendey, 1999, p. 304), pursuing answer styles (Yes- vs. No-style) (Mummendey, 1999, p. 304), giving neutral answers (North & Reinhardt, 2005, p. 58), and simulation tendencies (Mummendey, 1999, p. 304).

Especially, with evaluating social competences by self-assessments it has to be remarked that self-ratings can not be interpreted as direct measures of competence. They have to be understood as measures of the perceived social competence. This perception is influenced by the individual

pretension towards social situations, accompanying emotions, and subjective interpretation of social situations (Riemann & Allgöwer, 1993, p. 154).

Despite the known disadvantages of self-assessment ratings, they are preferred over observation procedures. The main argument is the economic data acquisition compared to other ways. The larger the number of people to be evaluated the stronger this argument weighs (Frey & Balzer, 2003b, p. 156).

Assessment by others

Due to the known problems of self-assessment, assessment by others is employed to receive ratings from a different perspective. Next to questionnaire items, observations in natural work environments is a suitable approach. Comparing self-assessments with the assessment of others allows to quasi-objectify the self-ratings (North & Reinhardt, 2005, p. 61). This procedure is time-consuming and requires an informant who can give their rating about someone's competence. For economic reasons, this can not be conducted often (Kauffeld, 2003, p. 179). Different procedures of behavior observation in competences assessment are discussed by Walzik. The presented procedures use judging scales which help to objectify the observed behavior (Walzig, 2003).

Some of the known biases occurring in the assessment of others also apply in competence evaluation. There are: bias of first impression (North & Reinhardt, 2005, p. 58), bias due to self-relatedness (North & Reinhardt, 2005, p. 58), bias due to hierarchy (North & Reinhardt, 2005, p. 59), bias due to relatedness to the person evaluated (North & Reinhardt, 2005, p. 59), bias due to length of affiliation (North & Reinhardt, 2005, p. 59), halo-effect (Mummendey, 1999, p. 200), overstrained ability to differentiate (Mummendey, 1999, p. 201), and unfamiliarness with the observation categories (Mummendey, 1999, p. 202).

3.4.2 Instruments

As discussed in the previous sections, the evaluation of competences is an interdisciplinary field that allows various approaches. Due to the complex and manifold characteristics of competences, evaluating them requires all available procedures of measuring, characterizing, and describing. Especially the methods and evaluation procedures developed in psychology, sociology, linguistics, education science are suitable for this matter (Erpenbeck & Rosenstiel, 2003, p. XXII). Despite the challenges there are evaluation instruments for different aspects by various authors. For utilizing competence evaluation instruments in work-related situations, the methodological exact instruments may not be the ones that set through. Hence, various authors argue for the factor of social validity and acceptance of the assessment instrument (Erpenbeck & Rosenstiel, 2003, p. XXVI).

In 2003, a systematic review of the evaluation instruments published in Germany is provided by Erpenbeck and Rosenstiel in the "Handbuch Kompetenzmessung" (compendium competence evaluation) (Erpenbeck & Rosenstiel, 2003). It lists 44 evaluation instruments and gives a com-

plete and systematic overview about each instrument. The presentation distinguishes between evaluation instruments capturing one or more competences, competences grids, commercially distributed instruments, and a selection of foreign evaluation instruments. For the competence management in companies, there are software tools which manage competence profiles. Such software also allows the comparison between targeted competences and the actual extent of the competences (Arbinger, Jäger, & Spuhler, 2003).

A difficulty in rating social competences is the interpersonal relation between the involved persons. The impression of this interaction influences how one person's social competence is rated (North & Reinhardt, 2005, p. 47). Also, evaluating social competences with objective measuring procedures proves difficult when the underlying items are too abstract and out of work-relevant context (Frey & Balzer, 2003b, p. 156). Despite such challenges in the assessment of social competences, they are of particular interest. The diagnostics and the training of social competences have received attention at an early stage in diagnostics and clinical psychology as means to indicate deficiencies and initiate trainings (e.g. compare (Riemann & Allgöwer, 1993), (Ullrich de Muynck & Ullrich, 1994)). The assessment of social competences is limited since there is always a social situation which is rated. A compilation of tests for social competences - published between 1970 and 1999 - is presented by Bastians and Runde in 2002. They list 10 different methods and conclude that instruments based on multimedia approaches or applying various methods are suited best to capture complex constructs as social competence (Bastian & Runde, 2002, p. 194). Furthermore, the following more currents tests evaluate social competences: SOKO (Holling, Kanning, & Hofer, 2003), Gruppencheck (Erke, Racky, & Jöns, 2003), Kompetenzrad (North, 2003), Siemens-Führungsrahmen (Karnicnik & Sanne, 2003), KKR (Kauffeld, Grote, & Frieling, 2003), smk99 (Frey & Balzer, 2003a), Kompetenz-Kompass (Hänggi, 2003), and EOS (Kuhl & Henseler, 2003).

Empirical data supporting competence conceptions have been claimed in the past repeatedly (Barrett & Depinet, 1991, p. 1021), and the data gained by standardized test often do not provide acceptable reliability or validity measures (Barrett, 1994, p. 71). As the development of competence assessment instruments continues, attempts may arise to develop international standards and all-encompassing instruments. The design and implementation of objective, reliable, and valid assessment instruments has to be considered difficult. Measuring and quantifying competences on an international level must be considered highly time-consuming, risky and there are doubts if such an endeavor is worth the effort (Murray, 2003, p. 136). The outcomes of this endeavor are unclear and such an attempt criticized, like cultural differences distorting the results (thinking of the European Union) (Murray, 2003, p. 136). Though, possible benefits may be a better understanding of underlying concepts and correlations and a better comparability of employees. This may be a reason why there are so few proved and tested competence evaluation instruments although increasing efforts can be stated (Diettrich & Meyer-Menk, 2002, p. 7). Two approaches shall be mentioned that aim to measure competences at least on a national level and implement equivalent standards to describe competences: the French "bilans de compétences" and the Swiss "Schweizer Qualifikationshandbuch" (Diettrich & Meyer-Menk, 2002, p. 8). Both provide the systematic measurement and certification of competences.

3.5 Summary

Competence has become a very important concept in adult education and employment policy. It has been elaborated during the last fifteen years and replaced the concept of qualification by some degree. The competence-oriented training in vocational education is receiving greater attention accompanied by new teaching and learning methods, next to the traditional means of knowledge transfer. This shows the strong application-orientation of the competence discussion: a discussion that is driven from science, as well as from industry and education. The most established definition of competences describes them as dispositions for self-organization, which can be categorized into four main groups: personal competences, professional-methodological competences, social-communicative competences, and action competences. These four competence categories are sometimes referred to as key competences. They comprise more specific competences since this level is too abstract to be of any practical relevance. There are three further concepts, that are closely related to competence: qualification, key qualification, and metacompetence. Whereas competences focus on the individual disposition, qualifications describe a formal aptitude to master a specific task, that can be formally evaluated and certified. Key qualifications described superior qualifications, that are not bound to certain tasks but to derive new demands from a work environment. Metacompetences are defined as competences about competences, describing the ability to adequately assess the availability, potential benefit and learnability of competences.

Competence development is viewed as a biographical process of an individual during which competences are acquired, elaborated, and change. Supporting the development of competence can be achieved by training employees, providing conducive learning environments, and various methods of work organization. Transferring knowledge is an important factor in enhancing competent behavior. Another factor is the reflection about made experiences and their critical assessment. Reflection makes these experiences explicit and, thus, repeatable and transferable.

The assessment of competences is afflicted with the challenges of measuring psychological phenomena. Several evaluation instruments have been developed, especially social competences have been in the focus of attention. Various methodological procedures are applied; self-assessments are favored due to the economical advantages of this approach.

Chapter 4

Diagnostics

In this thesis evaluation instruments are developed making a statement about the extent of a person's competence. With one measurement the current competence state can be evaluated; though for the area of competence development, it is important to capture the competence state at multiple points in time. In adult education programs an upward trend of the development is expected. Stability in such a context means stagnancy of development. Thus, an evaluation instrument which is meant to capture competence development must be able to reflect the changes of the respective subject matter. This section discusses the purpose of diagnostics in general and describes the relevant performance criteria of this thesis' scope. As well, status diagnostics is contrasted with process diagnostics before closing this chapter with describing systemic diagnostics.

4.1 Purpose of Diagnostics

Diagnostics (Greek διαγνωση) in general refers to cognitive information processing following the stages from cognizing and perceiving to deciding. In adult education, this process follows rule-based collection and processing of information about human sensation and behavior in learning environments. As such, diagnostics can be conducted in order to gain insight about learning process by describing, classifying, explaining, predicting, and evaluating states and/or processes of human sensation and behavior (Eid & Petermann, 2006, p. 16).

In psychology, the field of diagnostics is strongly related to psychometric testing. This field of diagnostics intends to capture latent characteristics which are not directly observable. In turn, these characteristics are used to explain observed behavior. There is a continuous upward trend of establishing psychometric tests. Not only for psychological testing, but also for for the areas of medicine and economy (Eid & Petermann, 2006, p. 15) but also in management studies and educational science. Thus, in competence research competences are defined as latent characteristics that have to be captured by operationalizing and evaluating apparent indicators

(Brähler & Schuhmacher, 2005, p. 191).

As far as competence development within an individual is the object of investigation, diagnostics can be described as proposing and testing an idiographic hypothesis. In contrast to some fields of psychology (e.g. perception, motivation, emotion) this hypothesis refers to a single case rather than to a group of people (Westmeyer, 2006, p. 35). The prognosis resulting from this hypothesis aims to predict the development of an individual under given restrictions in comparison to a reference group (Eid & Petermann, 2006, p. 17).

Scientific diagnostics requires a theoretical background upon which an individual's behavior can be described, explained, and predicted. For this interpretation, the theoretic construct has to be operationalized into observable entities (Yousfi & Steyer, 2006, p. 46). Empirical data gained by measuring are ascribed to the theoretical concept which again is interpreted and results in a diagnosis. This diagnosis guides a counselor's actions by providing background knowledge about different courses of action (Fiegl & Reznicek, 2000, p. 242). This understanding of a diagnosis is similar to the conception of the Generic Principles (see section 2.2.3). The difference is that the selection for one Generic Principle is based on the evaluation of a counseling process instead of evaluating a person.

In diagnostics, multi-methodological approaches take hold for the reason that there are phenomena that can be only considered correctly if different information levels and different evaluation procedures are employed (Mühlig & Petermann, 2006, p. 99). The multi-methodological evaluation refers to different aspects of diagnostics such as: evaluation dimensions (biological, psychological, social), data source (counselor, client, institutions), perspective (self-report, informants), function (behavior, sensation, social integration, cognitive functions), and evaluation procedures (psychometric test, questionnaires, self-ratings, external ratings). The advantages of multi-methodological diagnostics are inter alia the verification of data by using several data sources, and thus, a higher validity of diagnoses (Mühlig & Petermann, 2006, p. 100).

By employing self-reports and informant assessments in the same diagnostic process, biases occurring in ratings are relativized (Mühlig & Petermann, 2006, p. 101) but, also, moderate correlations are to be expected. In systemic diagnostics both work complementary (Stieglitz & Freyberger, 2000, p. 303). In the area of management diagnostics, the 360°-review complements the multi-methodological approach by adding more perspectives. The ecological and prognostic validity of an assessment increases by adding more perspectives but this procedure inhibits the attempt of standardizing evaluation (Sarges, 2006, pp. 742-743). In order to limit the costs of a multi-methodological approach, the well-founded selection and restriction to relevant dimensions and approaches is crucial (Mühlig & Petermann, 2006, p. 106).

4.2 Performance Criteria

Performance criteria describe the quality of an evaluation instrument. They can be be divided into two groups: primary and secondary performance criteria. There are three primary performance criteria (objectivity, reliability, and validity) and a number of secondary performance

criteria of which standardization, comparability, economy, and utility are discussed below.

4.2.1 Primary Performance Criteria

The primary performance criteria objectivity, reliability, and validity can be described as quantitative coefficients. These three concepts and their corresponding mathematical analogons are interdependent of each other as classical test theory describes (cf. (Lienert & Raatz, 1998)). In classical test theory this set of performance criteria is essential for rating a test's quality.

Objectivity   Objectivity describes the independence of test results from an investigator. Therefore, a test is completely objective when different investigators come to the same conclusion. As a statistical measure, the average correlation of different investigators' ratings regarding the same object of investigation can be considered. There are three aspects of objectivity: routine, analysis, and interpretation. **Routine objectivity** refers to space and time of the diagnostic situation, the cognitive and emotional state of the test person, and the instruction. As it is difficult to standardize the diagnostic situation, a common way of gaining routine objectivity is to give a standardized, written test instruction and to limit the interaction between test person and instructor (Lienert & Raatz, 1998, p. 8). **Analysis objectivity** describes to what extent there are transformation rules from an answer to a numerical value. Psychological tests that have answer scales with defined categories possess this type of objectivity. Projective tests or tests with open answer schemes are less objective in this sense (Lienert & Raatz, 1998, p. 8). **Interpretational objectivity** refers to the unambiguousness of the classification of test results to interpretations. The more a test is standardized, the higher interpretational objectivity can be assumed (Fisseni, 1997, p. 68).

Reliability   A test's reliability is the consistency of a set of measurements or measuring instruments. Reliability does not imply validity; it only indicates if a characteristic is measured consistently, but not necessarily what it is supposed to measure. The reliability coefficient shows to what degree the test results of one subject match; meaning how well they can be reproduced. The reliability of a test can be defined in three ways (Lienert & Raatz, 1998, p. 9). First, **parallel-forms reliability** is determined as the correlation of two strongly comparable tests filled out by the same subject. Second, **test-retest reliability** is described as the correlation of test results gained from one subject filling out the same test at two different points in time. Third, **internal-consistency reliability** is used to assess the consistency of results across test items within one evaluation instrument (scale). Following the reliability measures as defined in classical test theory, there is a true score which is sought to be found by repeated tests. Deviations are interpreted as errors. Thus, the development of characteristics can not be properly represented.

Validity   Validity is the measure of accuracy that indicates how well an evaluation instrument actually measures what it is supposed to measure. Thus, it serves as an indicator of the relation

between the empirical relative and the numerical relative (Mummendey, 1999, p. 93). There are three types of validity: content validity, construct validity, and criterion validity. An evaluation instrument with high **content validity** measures precisely what it is supposed to measure and represents the characteristics intended. In such case, the test is the ideal criterion for this characteristic. To evaluate content validity, experts who are familiar with the characteristic to be measured are asked to rate how well a test item is able to measure the characteristic (Lienert & Raatz, 1998, p. 10). There is **construct validity** when an evaluation instrument reproduces the same theoretical structure of a construct when empirically utilized (Lienert & Raatz, 1998, p. 11); for example when the dimensional structure of a construct is reassessed with a factor analysis (Bortz & Döring, 2003, p. 518). **Criterion validity** describes the correlation between a test result and the result of a standardized criterion. The higher the correlation coefficient the higher the conformance between both (Mummendey, 1999, p. 98).

4.2.2 Secondary Performance Criteria

A characteristic of all secondary performance criteria is that there are not quantified in numbers to describe the goodness of the respective criterion. In the following, the criteria standardization, comparability, economy, and utility are described.

Standardization   A standardized test gives specifications which allow the comparison of individual test results with the results of a comparison group; available either as raw data or transformed data (Lienert & Raatz, 1998, p. 11). The challenges of the standardization procedure lay in the selection of an appropriate norming sample, achieving normal distribution of raw data and standardized data, considering the dependency of the norm data of the random sample, and watching cultural-ethical dependencies (Fisseni, 1997, pp. 120-122).

Comparability   A test is comparable when there are one or more parallel tests. This allows calculating intra-individual reliability comparison by testing subjects with both parallel test. Comparability also can be achieved by comparing the test with a second test of a similar validity area (Lienert & Raatz, 1998, p. 12).

Economy   A test meets economical criteria when it uses little material and can be conducted in little time. Also, it is considered economical when it is easy to handle, can be used in a group test, fast and easy to evaluate. (Lienert & Raatz, 1998, p. 12).

Utility   An evaluation instrument is useful when it captures or predicts behavior or a trait of practical relevance and if no other evaluation instrument is able to to capture the same characteristic of interest. The utility decreases if other instruments can test the same characteristic (Lienert & Raatz, 1998, p. 13).

4.3 Procedures in Diagnostics

A diagnosis relies upon information the diagnostician gathers. A number of various methods can be applied, each having specific advantages and disadvantages. In the following, the diagnostic procedures are listed which are relevant for the scope of this thesis.

Informant Assessment   The goal of informant assessment is to have a person report about another person on the subject of interest. This informant can either have a close and long-lasting relationship (partners, family, friends), a loose relationship (strange vs. acquaintances), or they may have met the target person in a professional context (teachers, colleagues) (Neyer, 2006, p. 143). These observers assess the target person with personality ratings, frequency occurrences, or Q-Sort ratings over behavior or personality profiles. The underlying assumption is that the informants have the opportunity to observe the target persons before giving the assessment. The accuracy of an informant assessment can be verified by observational methods, ratings by experts, inter-rater reliability or self-reports. Due to economical reasons, the consensus between an informant and a self-report or inter-rater reliability are preferred. The correlations between these ratings are usually moderate (between .30 and .60) (Neyer, 2006, p. 144).

Questionnaire   A questionnaire is a collection of questions, which are used to systematically survey a defined group of persons about a defined topic. Questionnaires are used in many contexts like in personality psychology, market research, and opinion research. Besides the differences regarding the content, there are formal characteristics that determine the shape of a questionnaire. These characteristics are the degree of standardization (non, partly, or full standardized), mode of questioning (written vs. verbal), individual diagnosis vs. groups comparisons, and content (facts, attitude, interests, traits) (Rammstedt, 2006, p. 110). Guidelines and principles of constructing and validating a questionnaire are well-discussed throughout literature (as reference compare (Mummendey, 1999), (Lienert & Raatz, 1998), (Fisseni, 1997)).

Observational Method   Observation aims to describe open or hidden behavior of one or more persons. For assessing behavior in real-life situations, conducting systematic observation is an appropriate approach; it is especially suitable for the identification and analysis of the interaction between couples, parents-children, or client-counselor observation (Westmeyer & Nell, 2005, p. 200). For this, observational categories, time intervals, settings, and distinct observational rules are defined to ensure a systematic and controlled procedure. The difficulty of the observation depends on the defined observational categories (micro vs. macro level) and the answer scales (nominal vs. ordinal). Observations are used to analyze processes, the interaction between processes, raising awareness for inappropriate behavior, or capturing behavior over a day's run (Bodenmann, 2006, p. 152). In spite of using rating scales and trained observers, observation biases may occur depending on the situation (e.g. mood, ability to concentrate, sympathy, antipathy). These factors influence the quality of the observation negatively (Bodenmann, 2006,

p.). Lastly, it should be noted that the theoretical and methodological basics for behavior observation are not as elaborate as for test procedures and questionnaires (Westmeyer & Nell, 2005, p. 200).

Interview   An interview is a verbal communication between an interviewer and an interviewee following a previously determined outline aiming to receive information useful for diagnosis and therapy (Keßler, 2005, p. 216). The degree of standardization varies: There are types with very little specifications, half-standardized types with a given number of questions but open answers, and highly standardized interview guidelines which provide questions and answer options. The interview type depends on the subject of interest and the target group. Interviewing is a frequently applied method, thus, it could be assumed that the daily routine results in increasing interview competence. Instead, there is evidence that lacking training of interview competences during university education and little supervision of everyday work rather leads to the development of less empathetic, more directive interview styles (Keßler, 2005, p. 216).

4.4 Problems

The procedures of self-assessment or assessing by others have specific problems that are known in psychological literature (cf. (Mummendey, 1999)). Potential sources of judgment biases in self-reports can be: mistakes caused by test construction (unclear phrasing), effects of item positioning and answer scales, unintentional biases due to memory impairment, intentional adulteration (simulation, trivialization), and response sets (e.g. social desirability) (Brähler & Schuhmacher, 2005, p. 192). Also, self-ratings are based on the basic ability of introspection without which no judgment about oneself is possible. To prevent these, it should be tested if the test person fulfills the required cognitive requirements. Also, using control scales can help to detect response sets (Stieglitz & Freyberger, 2000, p. 301).

Diagnostics of human behavior and sensation is subject to situational influences. The strength of this situational influence determines the correlation of several measurements and the predictability of a characteristic. Knowing the sensitivity of an evaluation instrument to these influences is important for making appropriate diagnostic decisions (Schmitt & Hofmann, 2006, p. 480).

For informant assessment response sets and systematic judgment biases, like the Halo effect, are important (Brähler & Schuhmacher, 2005, p. 192). Qualifying the raters by intensive training and operationalizing the phenomena to be observed seem to be appropriate means to reduce erroneous judgments (Stieglitz & Freyberger, 2000, p. 301). The success of the training can be evaluated by calculating the interrater-reliability.

4.5 Status Diagnostics vs. Process Diagnostics

The diagnostic question determines if the focus of the diagnostic procedure lies on capturing the characteristics of a current state (status diagnostics) or on capturing the characteristics and their development over time (process diagnostics). The difference between both approaches is less than it seems at first: Both, status diagnostics and process diagnostics, require the capturing of the as-is state of a person. Status diagnostics may consider the change of the measured characteristics over time. The transition between both approaches is smooth because repeated status measurements can replicate a process (Laireiter, 2000, p. 325) and process diagnostics requires status diagnostics (Mummendey, 1999, p. 361).

Status Diagnostics Status diagnostics makes a statement about a current state at a certain point in time. This comprises comparing the as-is state of an individual with a reference group and the distribution of the characteristics to be measured (Brähler & Schuhmacher, 2005, p. 194). Beyond this statement, there are two more intentions: First, future behavior shall be predicted from knowing the current state, and second, underlying trait characteristics shall be identified (Eid & Petermann, 2006, p. 18). This approach concentrates on description, classification, explanation, prognosis, and evaluation but less on intervention. This aspect receives greater attention in process diagnostics (Brähler & Schuhmacher, 2005, p. 194).

Process Diagnostics Process diagnostics aims to capture changes or stability of characteristics over time by comparing several measurements. Changes in the resulting time series can be interpreted as consequence of a natural process (e.g. growth, learning), of an intervention (e.g. therapy, crisis), or of context-dependent variability (e.g. daily incidences). These assumptions can only be tested when there are evaluation instruments sensitive to change (Eid & Petermann, 2006, p. 19). Considering this focus, comparing the results of a diagnosis with the characteristics of a reference group is less important. Instead of a reference group, the position of an individual is defined from a given criterion (Brähler & Schuhmacher, 2005, p. 194). Process diagnostics allows the evaluation of the impact of an intervention. In learning settings it allows the reactive adaptation of the teaching behavior according to the learning individual (Laireiter, 2000, p. 321). In process diagnostics, the secondary performance criterion of economy becomes especially important. Accompanying and monitoring a process requires efficient and low-cost evaluation instruments to reduce the burdens. Also, it should not hinder the teaching process and must not overburden the learner's capacity (Laireiter, 2000, p. 334).

Process diagnostics measures the state of a person at, at least, two different points in time. It is assumed that the person's behavior (or sensation) changes in between both measurements due to an intervention. Changes can be captured if either parallel situations or parallel measurements capturing these situations can be developed (Fisseni, 1997, p. 361). Considerable challenges are faced constructing parallel situation or measurements: manifold influences can inhibit or lower parallelism. For example, there are knowledge transfers from one situation to the next,

emotional and motivational sensitivity, changed social and material environments (Fisseni, 1997, p. 361). Several solutions have been proposed (inter alia parallel tests, instruments sensitive to change, probabilistic procedures, multivariate linear models, analysis of time series) but none have solved this basic problem (Fisseni, 1997, pp. 362-363).

4.6 Systemic Diagnostics

Systemic diagnostics deals with the representation of system-relevant variables of the members of a system. It focuses on the interactions between these members but also considers the structural aspects of the system (Bodenmann, 2005, p. 158).

The diagnosticians do not treat the relevant system like an object, judging a problem and phrasing a diagnosis. Systemic diagnosticians become part of the respective system, knowing that they are part of the constituted system. As well, they are aware that the systemic perspective views constantly changing systems (Cierpka, 2000, p. 218). The information gained. e.g. in a counseling process, is based on the constructions of the counselor and the client. They allow to understand the experienced process dynamics. This means that all diagnostic information is not objective but influenced by various contexts and the system members, and that the diagnostic situation is only one part of a dynamic interaction process. This understanding of a diagnostic process interferes with the criterion of objectivity (Schiepek, 1991, p. 39), according to which, the influence of interfering variables should be standardized for the diagnosis to be independent of the diagnostician (Westmeyer, 2006, p. 35).

The function of systemic diagnostics consists of providing a working hypothesis rather than stating a fact. An idiographic system model provides information about a system's dynamics, its mutual dependencies and potential for interventions (Schiepek, 1986, p. 57).

In psychology, systemic diagnostic focuses on improving dysfunctional interaction patterns which inhibit wanted developments (Cierpka, 2000, p. 218). To do so, systemic diagnostics applies multi-methodological approaches to view the system and its dynamics from different perspectives (Cierpka, 2000, p. 219). Questionnaires are often used in couple and family assessments. This captures the self-perspective more validly than interviews and it is less time-consuming. Systematic observations are helpful for assessing the interaction between persons. Video or audio tapes are assessed by external observers. This allows viewing process dynamics, also on a micro-analytical level in a natural setting (maximum ecological validity) (Bodenmann, 2005, p. 163). Interviews, physiological and endocrinological measurements are further approaches to capture systemic dynamics (Bodenmann, 2005, p. 161). But it has to be mentioned that there is dissent about the usage of standardized questionnaires or tests. This contradicts the idea that a given context shall be assessed by the concerned client (Fiegl & Reznicek, 2000, p. 238).

Unlike in other diagnostic approaches, systemic diagnostics explicitly looks at the diagnostician (counselor) as the cognitive (describing) system, the described system (individual, social system), and the counseling process (Schiepek, 1986, p. 50).

4.7 Summary

Diagnostics is the process of information collecting upon which decisions are made. According to scientific standards, rules for information gathering and deciding are applied.

Multi-methodological approaches have many advantages as there phenomena that require to be evaluated on different information levels and procedures. This also allows the verification of data, viewed from different perspective, such as: evaluation dimensions, data source, perspective, function and evaluation procedure.

The quality of an evaluation instrument is described with performance criteria. The primary performance criteria objectivity, reliability, and validity can be described as quantitative coefficients. The group of secondary performance criteria are of qualitative nature; there are no quantitative numbers to characterize them.

As for procedures in diagnostics, there are four important procedures discussed: informant assessment, questionnaire, observation, and interview methods. Each of the procedures mentioned offer specific advantages and disadvantages. A mixture of procedures is applied in multi-methodological diagnostics to combine the advantages and compensate the disadvantages.

The appropriate procedure depends on the diagnostic question. It also determines whether status or process diagnostics is adequate. If the focus lies on capturing the characteristics of a current state, status diagnostics is the appropriate choice. If the development of characteristics over time is intended to be viewed, process diagnostics should be applied.

Systemic diagnostics is a special perspective on the diagnostic situation, and the object of interest. Systemic diagnostics takes into considerations the environment of the object to be diagnosed and the multiple interactions of this object with the environment. Classificatory diagnostic models are not applied, constructing new perspectives is predominating in systemic counseling.

Chapter 5

Quality Management in Systemic Training Institutions

In summer 2007 a survey was conducted with the goal to gain insight in the procedures of quality management in a specific field of adult education. For this purpose, two groups of organizations are selected. SG (Systemische Gesellschaft) and DGSF (Deutsche Gesellschaft für Systemische Therapie und Familientherapie) are both professional associations for systemic training offerers. Due to the enormous - and basically unknown - number of training offerers in this field, these organizations were selected as they standardize their participants' curriculum, required training, and facilities.

It was intended to gather information about the practices of participant assessment and the evaluation of competence developments, the frequency and type of applied methods.

This preliminary survey is a requirement analysis and allows the discussion about the necessity of further evaluation procedures in systemic trainings.

First, this chapter presents an overview of systemic training programs in Germany before the findings of the study are illustrated.

5.1 Systemic training programs in Germany

In 1996, the Arbeitsgemeinschaft für Systemische Therapie (Consortium for Systemic Therapy) started an initiative to have systemic therapy and counseling officially accredited by German health insurances. This petition was based on a comprehensive compilation and assessment of systemic therapy in theory and practice (Schiepek, 1999a). Not considering the achievements of systemic therapy, the amendment of the law on psychotherapy in June 1998 still recognizes psychoanalysis, psychodynamic psychotherapy, and behavior therapy (psychthg, 1998). As a consequence, only licensed psychotherapists of these three psychotherapeutic schools are al-

lowed to carry the title "Psychotherapeut". Also, this licensure allows psychotherapists to get reimbursed for the therapy costs by German health insurances.

Therefore, many professionals following systemic approaches work at counseling centers that offer advice and counseling free of charge supported by charitable organizations, e.g. churches or community services. Further fields of activity are the departments of organizational development or human resource development. There is a high number of institutions offering trainings in systemic counseling and therapy and only some of them are organized in a professional association. An unknown number of institutions exists since there is no umbrella organization embracing all the existing institutions. The success of a comprehensive Internet research is thought to be limited as it can be assumed that not every institution has its own website.

In summer 2007, there are two professional associations in which bodies of systemic education and training programs are organized: Systemische Gesellschaft (SG)[1] and Deutsche Gesellschaft für Systemische Therapie und Familientherapie (DGSF)[2]. SG was founded in 1993 with the objective of representing and enhancing the systemic approach with a focus on supporting systemic research in theory and practice. It was founded to provide a platform for institutions with a systemic focus (Ludewig, 1999, p. 10) and currently represents 31 institutions. DGSF was founded in 2000 merging two predecessor organizations and by May 2007 68 institutions are members of DGSF. DGSF aims to enhance family therapy/counseling, systemic therapy/counseling, and systemic thinking and working in professional settings.

Both associations see systemic education and training as their core business. They require their members to follow standardized curricula. Despite being organized in two different organizations, there is a high consensus about the curricular requirements. Both require their participants to have a university degree and at least some initial working experiences in the psychosocial sector as well as the possibility to put the newly acquired competences into practice. In order to receive a certificate in systemic counseling, a total amount of 550 hours is required. This total number is divided into time for theory and methods, supervision, intervision, self-awareness and self-reflection, counseling time, and homework.

At present, the members of SG and DGSF can be considered to be the only accessible population of institutions offering systemic training programs. They all comply with a defined set of standards. At time of this study, this population is exhaustively known.

5.2 Quality Management - A Preliminary Survey

In the beginning of June 2007, all the members of SG and DGSF received an e-mail with an attached letter of invitation and a short questionnaire. The addressees were asked to support a doctoral thesis by answering a short questionnaire regarding the modalities of participant assessment in their training programs. The questionnaire contained six questions that covered topics of course and participant assessment focusing on the degree of formality. This included questions

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[1]http://www.systemische-gesellschaft.de/
[2]http://www.dgsf.org/

about modalities (video or audio recording, live interview), roles (evaluation by oneself, evaluation by others), and feedback modes (verbally, written; with / without a given set of criteria). Also, the point in time of the assessment was asked.

A total number of 99 e-mails were sent out, 68 to members of DGSF (69 %) and 31 to members of SG (31 %). The response rate one month after sending out the initial e-mails was at 23.2 % (DGSF 73.9 %; SG 26.1 %). After a reminder e-mail was sent out the response rate was raised by 6.1 percentage points up to 29.3 % . The composition of the random sample 75.9 % for DGSF and 24.1 % for SG shows a slight underrepresentation of the members of SG. Due to the total number of subjects (29), the results are not divided into subgroups. Possible differences between SG and DGSF are irrelevant in this context, since the focus is on the overall situation.

For each institution, one representative was invited to take part in the survey. Their answers, though, can be generalized to the complete institutions, since all representatives stated that the answers are valid for their colleagues, also. Thus, the following results are considered representative for the institutions who took part in the survey.

5.2.1 Survey Results

First, some general findings are presented about the class evaluation and the frequency of competence assessment. Following, the possible procedures and assessment variants applied in systemic trainings are illustrated.

The evaluation of the class and the evaluation of the participants' competence state seem to be standard procedure. 89.7 % of the institutions evaluate the class, respectiveley the trainer, and in all but one institutions (96.6 %) the competence status of the participants is evaluated. Asking about the point in time of the evaluation of the participants, it shows that collecting data at the beginning of the training is only done by a quarter, but at the end of the class the competence status is evaluated quite often (see table 5.1). As well, 22 institutions (75.9 %) evaluate the state during the ongoing class. The interval between these evaluations varies greatly between the institutions. The shortest reported period of every quarter three months up to once in the middle of the full training.

Table 5.1: Competence Evaluation

	Yes	**No**
Competence Status Evaluation	100 %	
Evaluation at beginning	24.1 %	75.9 %
Evaluation in between	75.9 %	24.1 %
Evaluation at the end	82.8 %	17.2 %

Procedures

With respect to the procedure applied for evaluating the competence level, the survey distinguishes between life interview, video recording, and audio recording. Life interviews are often conducted in 27 of 29 institutions (93.1 %), also video recordings are quite often used (25 institutions, 86.2 %). Less often audio recordings are employed (9 institutions; 31 %). Table 5.2 lists the use of the procedures, depending on their usage in informal or formal settings. For the life interviews, it shows, that they are used more often in formal settings. For audio and video recording, there is no substantial difference between the setting variants.

Table 5.2: Procedures

	informal		formal	
	n	%	n	%
Life interview	16	55.2	21	72.4
Video recording	14	48.3	16	55.2
Audio recording	5	17.2	6	20.7

Assessment Variants

The way of rating the competence level of class participants, can be described on four different dimensions. *Perspective* In trainings, there are typically three perspectives from which an assessment is possible: competence holder (first person perspective), peers, and the trainer of the class. *Verbal or written feedback* This dimension describes if the ratings of the competence level are given verbal or written. *Availability of a checklist or category system* This describes if there is a checklist or a category system, along which the feedback is aligned. *Formality of the assessment* This dimension distinguishes between informal and formal settings. Competence assessment in an informal setting happens after rehearsal interviews or role plays during the seminars. They are given occasionally, without advance notice and have a casual character. Formal setting means that the assessment takes place on an announced date, so that all participants are aware of it. They even may be written down in the institution's curriculum.

The following three tables depict the crosstabulations of the four dimensions described above. For the dimension "perspective", there is a crosstabulation for each perspective. Multiple answers were possible.

Due to the low number of cases, the minimum number of 5 entities per cell is under-run in too many cases in order to perform X^2 tests. Thus, the data presentation is limited to descriptive statistics.

Self-Assessment   In general, verbal self-assessment is found in all 29 institutions. Self-assessment written, however, is less common with 15 institutions utilizing this method.

Table 5.3: Self-Assessment by Participants

		self, verbal		self, written	
		n	%	n	%
informal setting	with checklist	5	17.2	5	17.2
	without checklist	20	69.0	8	27.6
formal setting	with checklist	7	24.1	9	31.0
	without checklist	12	41.4	2	6.9

It shows, that the verbal self-assessment is used more frequently than in writing. Also, if self-assessment occurs verbally, its is done without a checklist or a defined category system more often than with one. The discrepancy between the availability or absence of a checklist is less distinct when self-assessment occurs in written form.

It seems that the combination of verbal self-assessment in an informal setting without a checklist is the most common way to state the competence level of an individual (20 entries, 69.0 %). The combination of written self-assessment, formal setting, without checklist, however, receives the least entries (2 entries, 6 %). This shows the basic tendencies found: evaluating the competence level tends to happen in informal settings and without a checklist. Plus, the assessment occurs verbally rather than written. This pattern is valid for the following two tables, as well.

Assessment by Peers   A verbal assessment by other class participants takes place in 25 institutions. This relation is inverted when it comes to the assessment by other participants written. Only 4 institutions use written feedback, whereas 25 institutions do not. Assessment by peers usually happens without a checklist or category system. In informal settings, the number of entries for verbal assessment without a checklist (20 entries, 69 %) is exceeded by the number of entries for written assessment without a checklist (29 entires, 100 %).

Table 5.4: Assessment by Peers

		Peers, verbal		Peers, written	
		n	%	n	%
informal setting	with checklist	2	6.9	2	6.9
	without checklist	20	69.0	29	100.0
formal setting	with checklist	2	6.9	3	10.3
	without checklist	12	41.4	1	3.4

Assessment by Trainer   The last type of assessment is the rating of the participants' competence level by the trainer of the class. In this sense, the trainer serves as an expert.

Table 5.5: Assessment by Trainer

		Trainer, verbal		Trainer, written	
		n	%	n	%
informal setting	with checklist	2	6.9	2	6.9
	without checklist	21	72.4	1	3.4
formal setting	with checklist	3	10.3	4	13.8
	without checklist	16	55.2	2	6.9

In total, in almost all of the institutions the competence level of the participants is evaluated by the trainer. In 28 institutions, the trainer does so verbally, but in only 2 institutions, there is a written competence assessment. This table shows clearly the preference of verbal assessment over written assessment. The variants of formality of the assessment settings is not reflected in the data, except for the use of a checklist. Trainers assess the competence level clearly more often without checklists than with checklists.

5.2.2 Conclusion

A comprehensive overview of the procedures of quality management in all systemic training institutions can not be given, since the population is unknown. Therefore, the members of the two professional associations DGSF and SG form the sample for this preliminary study.

In this study, the response rate of 29.3 % can be considered as good. With a total of 99 institutions, this results in a quite low number of answers (29). As a consequence, inferential statistics are not calculated, because the necessary number of cell entries for X^2 tests is not obtained in many cells. Therefore, the findings have to be interpretated carefully and have to be considered as tendencies, rather than secure findings.

The evaluation of the classes and the trainers, and the evaluation of the participants' competence levels and progress are standard procedures in all institutions. The participant assessment is conducted more often at the end or during of the training; an assessment in the beginning happens rarely. Formal assessment settings are quite scarce, informal settings are reported more often. Independent of the formality degree of the assessment, life interviews are the most common procedure, closely followed by video recordings. Audio recordings are comparatively seldom.

The competence level of participants is evaluated from different perspectives: self-assessment, assessment by peers and the trainers. All three perspectives are important sources for feedback and reflection and help in developing abilities and skills. There is a tendency that informal settings are applied more often than formal settings as well as a preference for verbal assessments over written assessments.

There is one clear trend: participants' competences are mainly assessed without checklists or category systems. The discrepancy between assessment with vs. without checklist in informal settings is greater then in formal settings, in which obviously more checklists are utilized.

With respect to participant assessment, there is a low frequency of checklist usage, and thus, little comparability in the quality and the nature of the competence assessment. Competence assessment without checklists shall not be diminished as it is valuable for the development of counseling competences as well and there is no need for having standardized methods at every point in time. But the existence of comparable, if not even standardized, methods and instruments is considered highly important, so they can be combined with other ways of competence assessment.

Chapter 6

Problem Statement

The following section describes the problem statement which is derived from the four areas "Synergetics and Systems Competence", "Competence", "Diagnostics", and "Current Practice". For each a number of critical aspects and shortcomings are specified and the arising implications reconsidered. They span the problem statement upon which this thesis is developed on. The essentials of the problem statement are summarized in the thesis' goal at the end of this chapter.

6.1 Systems Competence

From the area of System Competence and Synergetics the main implications regard the lack of operationalization and evaluation. For designing appropriate instruments, aspects of the construct have to be selected and training modules developed which allow self-organization of the training participants. Suitable training and evaluation settings have to be considered.

This section describes these implications in more detail. It covers the issues self-organization, empirical evidence, selection of aspects, methodological approach, and experiential learning.

Self-Organization Synergetics is a theory of self-organization, which assumes that the direct influence onto systems is not possible. By providing the appropriate conditions, though, systems can be supported in destabilization and a re-stabilization into a different order. Upon this theoretical framework, the training of systems competence has to follow the principles of Synergetics (see section 2.1 on page 15). When learning is considered as restructuring one's cognitive system, then the training has to provide the conditions for self-organization for the training participants.

Empirical Evidence The basic assumption of Synergetics have been successfully established and empirically verified. Evidence has been found in many disciplines, as in physics (see page

24) but as well in psychology (see section 2.1.3 on page 26). Systems competence is the logical consequence of Synergetics since it list the necessary competences to provide the adequate conditions for self-organization. Whereas the basic assumptions of Synergetics have been validated, systems competence still lacks the empirical validation, though. There is no evidence in literature that lists the explicit operationalization and evaluation of systems competence.

Selection of Aspects   The construct systems competence consists of very many aspects. The incautious use of the term systems competence in everyday speech may lead to an oversimplification of the concept, neglecting the heterogeneous character of the subsumed dimensions and categories. The complexity of the construct will inhibit the seriousness of its operationalization when systems competence is evaluated on this top level (see Reinecker about this topic in systemic diagnostics (Reineker, 1987)). Thus, single aspects have to be selected and operationalized first, favoring a microscopic over a macroscopic approach. The developed evaluation instruments for single aspects then can be combined in a tool box for assessing systems competence.

Methodological Approach   There are several methodological approaches to capture systems competence: gaming simulation, system role play (SRP), computer scenarios, and assessment centers (compare section 2.2.4 on page 46). Each of these evaluation settings confront the subjects with complex, intransparent, and unknown situations; even the goal to be achieved is unknown in some situations. Thus, these evaluation settings are appropriate for evaluating macroscopic behavioral patterns of individuals or even groups (possible with SRP). In contrast to these approaches, gaming simulation allows to locate the evaluation setting as a counseling situation and the evaluation of the underlying competences, skills, and abilities in order to gain a more detailed view onto the learning process. For capturing the competence development in systemic counseling gaming simulation is the appropriate approach.

Experiential Learning   Experiential learning is considered important for the acquisition of systems competence. In order to become competent in systems, experiencing the complexity and intransparency of the system to deal with is necessary. It supports the development of the respective competences. Allowing experiences, thus, should be a guideline for the development of trainings and evaluation instruments.

6.2 Competence

There are implications derived from the area competence and described in three main topics: missing appropriate evaluation instruments and, thus, a lack of empirical data, methodological considerations for competence assessment, and adequate settings and support for acquiring competences. They are broken down into several themes and explicated in the following.

Insufficient Data Records   The empirical data basis about competence development is not abundant, although there is a number of evaluation instruments for various purposes (Erpenbeck & Rosenstiel, 2003) and for the area of social competences (see page 81). The projects funded by QUEM report on isolated empirical data (as an example see (Voigt et al., 2005)). The area of social competences is an exception in this respect: psychometric indicators are given in various publications (for an exemplary list see page 82).

This may be connected to the fact, that there is a strong focus on the definition of competences and the context in which competence development is regarded. The competence evaluation instruments listed by Erpenbeck and von Rosenstiel (2003) list many evaluation instruments for use in professional work environments (e.g. TOP-Test (Wins, Kaschube, & Wittmann, 2003), ABAT-R (Schuler, 2003), arbeitsplatzbezogene Kompetenzen (Schaper, 2003), Führungskräfteplanung und -entwicklung (Gress, 2003)). In this case, company policies may prevent the publication of results.

Abiding by Psychometric Standards   In section 3.4.2 (page 81) it has been remarked that many instruments evaluating competences do not comply with the psychometric standards of the current state-of-the-art. This criticism is more related to questionnaires than to interview techniques. The literature about test development is manifold (for example see (Fisseni, 1997), (Lienert & Raatz, 1998)). Thus, evaluation instruments have to be developed for competence facets that conform to these requests.

Evaluating Systems Competence   None of the evaluation instruments listed in literature captures systems competence in the sense of the dimensions 2-6 (compare section 2.2.2). Social competences are covered by numerous instruments (see page 82). Thus, there is no need for developing another instrument for social competences but for the other dimensions of the construct.

Competence Biographies   The evaluation procedure "competence biography" utilized by Erpenbeck and Heyse is a variation of the narrative interview. It has many advantages over other methods (Erpenbeck & Heyse, 1999a, p. 207) but is also determined by a high effort from the interviewer and interviewee. Capturing competence biographies by the means of questionnaires is not adequate, thus, this method is not often applied. (Erpenbeck & Heyse, 1999a, p. 203). Plus, this method is designed for capturing competences that developed over a long time span. If the status of competences is of interest, then this method is not suitable.

Multi-Methodological Instruments   The evaluation of competences can be conducted with many different methods. Basically, the complete methodological repertoire of social sciences can be employed to identify competences (see page 79). The selection of the appropriate methods depends on the context of the evaluation, since every method offers specific advantages and

disadvantages. For the assessment of competences, thus, a mix of various methods can be applied. The more standardized the evaluation instrument, the easier is the use of such instruments in high frequency and without experts. This argues for the development of questionnaires and observation methods, for which the assignment rules form the empirical to the numeric relative are defined and the guidelines for the interpretation are provided (also see (Mühlig & Petermann, 2006)).

Modes of Assessment   Two basic approaches have become popular in competence assessment: self-assessment and assessment by others (compare section 3.4.1 on page 80). Self-assessment is the preferred method over other methods, e.g. for economical reasons, but it is subject to various biases. Assessment by others has the advantage of including different perspectives into the competence judgment, but, in turn, involves different biases. Since both procedures have disadvantages, they may as well be integrated in one evaluation instrument to profit from both procedures.

Multiple Measurements   Competences develop over time; they may rise, remain stable or even decay (see section 3.3.1 on page 73). To capture such a characteristic, multiple measurements are required, otherwise the dynamics of the competence development can not be represented appropriately.

Knowledge   Knowledge is a component of competence. As such, it is necessary to act competently (see page 75). If so, evaluating knowledge about specific competence-related topics should be part of an assessment.

Settings for Acquiring and Evaluating Competences   Competence development can be supported by utilizing several methods, as there are: classical training, conducive learning environments, and on-the-job learning. Trainings are primarily designed for knowledge transfer. Conducive learning environments describe learning contexts, in which the learners are motivated to interact, and exchange knowledge and experiences, and they are offered advanced material. In the context of counseling training, on-the-job learning can be rephrased as learning-by-doing by conducting interviews and learning by experiences and feedback. Competence development requires open learning scenarios which confront the learning individual with complex situations (see section 3.3.3 on page 75).

Supporting competence development happens by providing settings in which the individual is enabled to explore new behavior and create new knowledge and actions (Knoll, 2001, p. 147). The initial focus of systems competence is meant for clinical psychology, therapy or counseling. Thus, such competences should be trained and evaluated in counseling-relevant settings, e.g. in training interviews. This provides realistic evaluation settings, which cause a lower validity compared to standardized skill tests. But the realistic settings are thought to have a higher acceptance with participants that the classic skill testing (Hanft & Müskens, 2005, p. 15).

Reflection   Reflection has proven as an important means in competence development (compare section 3.3.4 on page 76). It is important due to the self-organized learning processes, in which the ultimate goal is not obvious at the beginning due to the complexity of the subject-matter. Reflection makes implicit experiences explicit. As a consequence, these experiences can be exploited in later learning phases.

Thus, a competence training should offer many possibilities to reflect one's own learning process. Also, evaluation instruments assessing competence should support reflection. During numerous iterations, which are accompanied by reflecting on one's situation over and over, new goals are set to be achieved (compare model of reflexive transformation in (Götz et al., 2003, pp. 42-44).

Suitability as Competence Model   The basic orientation of the construct systems competence as a collection of learning targets (see section 2.2.1 on page 32) so far has not led to a critical examination of the construct with respect to its suitability as a competence model. Indeed, the construct has not been validated as a competence model yet, although it can be argued that many categories have a high face validity for systems competence, especially the dimension "Social Competences". Although, systems competence has been developed over the last fifteen years - the same time frame in which the discussion about competences was strongly enforced - the concepts competence and systems competence have not yet been systematically compared.

6.3 Diagnostics

The well-defined area of psychological diagnostics provides many guidelines for the construction and analysis of tests. In this section, relevant implications are given for the scope of this thesis. It relates to the topics performance criteria, complexity reduction, multi-dimensional strategy, status vs. process diagnostics, observation, and systemic diagnostics.

Performance Criteria   In test development, the meaning of the performance criteria is very important (see section 4.2.1 on page 87). Classical test theory is based on the assumption that there is one true score for a certain characteristic. Deviations from this true score are considered errors (Fisseni, 1997, p. 71). Following this logic, varying observed scores arise from varying error percentages, and not from an increase or decrease of the true score. A development, thus, is interpreted as a fluctuation of an observed score around a true score. In process diagnostics, this is avoided by capturing data series, which are mathematically differently treated than the statistic coefficients relevant in classical test theory. If learning shall be presented, then process diagnostics is the methodology to be favored.

External validity, and thus, the generalization of results, has to be stressed in the context of competences. Also, they have to be applicable to groups besides the initial random sample. Laboratory research in which the criteria objectivity, reliability, and validity can be well controlled, is not advised in competence research with its strong connection to work environments.

If there is a focus on describing an individual's competence development, then the reference norm is based on the individual themselves rather than upon a group. The individual is assessed by the extent of the competences before training takes place. Adopting such an approach, standardization (compare page 88) becomes irrelevant at this point, due to the different norm approach (Walzig, 2003, p. 45).

Since competence evaluation is a significant concept in work environments, the secondary performance criteria economy and utility become important (see section 4.2.2 on page 88). Pursuing an approach that focuses on individual developments, the criteria standardization and comparability become less important than they are in clinical settings. For companies, the cost-benefit ratio is essential for the acceptance of the evaluation instrument. Even for trainings, in which the participants are interested in learning and assessing their competence level, the acceptance of the competence levels rises if the evaluation can be conducted economically.

Complexity Reduction   Systemic diagnostics can be considered as a process of complexity reduction which provides information for planning that results in circular operations (Fiegl & Reznicek, 2000, p. 244). Evaluation instruments surveying systemic counseling behavior, thus, should reduce the complexity of the counseling process in an appropriate manner and provide information about possible improvements for the counselor.

Status vs. Process Diagnostics   Capturing competence development implies the measurement of at least two points in time. If only the impact of a competence training is of interest, conducting a pre-test and a post-test is sufficient. For viewing the competence development over a longer period of time, methods of process diagnostics are more appropriate, especially when viewing this topic from a life-span perspective (see section 3.3 on page 71). In training contexts, the focus is on evaluation instruments that can capture the process dynamics and evaluate the learning process rather than just a status measurement.

Observation   Observation - as one of the most important approaches in capturing dynamical and process-related aspects - is tainted with a number of known biases. Although biases can not be completely avoided, the thorough selection of observers and their intensive training help to minimize them (Bodenmann, 2006, p. 157), and to ensure a satisfying inter-rater reliability (Westmeyer & Nell, 2005, p. 207). A defined set of symbols and the rule for coding and quantifying observed behavior also enhances the quality of the observation (Westmeyer & Nell, 2005, p. 206). The quality of self-observation data is limited when the scope of observation includes social interaction. Training and evaluation of systems competence includes social interaction. On this account, the self-observation needs to be complemented by further methods.

Systemic Diagnostics   The construct systems competence is deeply rooted in systemic thinking and systemic counseling. Thus, evaluation instruments for such competences should be geared to systemic approaches of diagnostics. Couple and family assessment considers several

data sources, referring to the different perspectives of the members of the counseling system (Bodenmann, 2005, p. 159). This allows the comparison of different perspectives, as the client's and the counselor's perspective. In training settings, an observer often comes into play who is not directly part of the counseling system. This observer provides a third perspective. The gained diagnostic information from these three perspectives is not objective, but highly subjective due to the involvement into the counseling system. This is especially important, since the self-assessment of one's competences is regarded as simple but imprecise. Assessment by others helps to objectify the self-assessment (North & Reinhardt, 2005, p. 61).

A fourth perspective - given by an external observer with spatio-temporal distance - allows to view the counseling process even from a very different perspective (compare (Lutz, 2005, p. 117). Therefore, evaluation instruments that allow to capture the evaluation from many different perspectives should be developed. The quality of this observation by external raters can be assessed by the inter-rater-reliability, although the use of this type of reliability is doubted in systemic contexts. From a constructivistic point of view, every rater constructs his own perspective upon their own background knowledge and previous experiences. Thus, the ratings about the object of assessment differ, increasing the error percentage in the rating variance.

6.4 Quality Management

In this section, the consequences drawn from the preliminary study are described. The considerations cover the established practices in systemic training organizations, availability of evaluation procedures, and the acceptance of these procedures.

Established Practices   The preliminary survey shows that there are established practices. Life interviews and video recordings are well established, whereas audio recordings are not often used in evaluating the competence level (see page 98). As well, assessing a participant's progress from different perspectives is common (see section 5.2.1), and thus, all three perspectives can be used in the assessment of counseling competences.

Need for Evaluation Procedures   The survey shows that checklists or category systems are seldom used in the assessment of competence levels (see page 100). Methods that allow intraindividual - but also interindividual - comparisons are necessary to complement other types of assessment. Only accepted procedures with a fixed set of categories or items permit capturing development processes. Accordingly, evaluation procedures need to be developed that can be utilized in trainings for systemic counseling.

Acceptance of Evaluation Procedures   The little use of checklist or category systems in systemic trainings may have various reasons that are unknown at this point. Lack of knowledge

about evaluation procedures and methods may be one reason or the discontent with the prevailing methods. Thus, evaluation instruments have to put a strong focus on two secondary performance criteria "utility" and "economy" (compare section 4.2.2on page 88).

6.5 Goal of Thesis

The main goal of this thesis is the development of evaluation instruments of the construct systems competence. Two sets of subordinate goals supplement this main goal: one for the area of training and one for the area of evaluation instruments. All three are described in the following.

Main Goal   The main goal of this thesis is to develop evaluation instruments for the construct systems competence. Due to the complexity and high number of aspects of the construct and in order to ensure an appropriate operationalization, a few aspects are selected. By this selection, the construct is is divided into some constituents which allows a more specific training of single competences, abilities, and skills. This fragmentation enables the targeted development of evaluation instruments on a microscopical level, since there are no evaluation instruments that assess systems competence on such a level at this point in time. The little use of evaluation instruments in systemic training institutions justifies developing a new set of instruments. Participants in such trainings make up the target group for the evaluation instruments, as well as students in university.

   Last, the construct systems competence needs to be assessed with respect to its suitability as a competence model. The dimensions listed and the complete construct have to be classified upon the theoretical background provided.

Subordinate Goal: Training   For the training there are several implications. A training has to be designed that takes into consideration the constraints in adult education, like time limitations and further commitments, as it is common for participants in counseling trainings. Also, the training design needs to allow self-organized learning. This requires appropriate settings (classical training, on-the-job learning, conducive learning environments) with a high degree of experiential learning. As reflection is crucial in competence development and counseling training in general, a training has to allow sufficient phases for reflecting on exercises and knowledge inputs.

Subordinate Goal: Evaluation Instruments   The evaluation instruments are meant to capture the competence development of participants in systemic trainings. In order to capture competence development, process diagnostics and multiple measurements are necessary, and evaluation procedures have to be developed that can be interpreted economically. This provides an empirical basis for assessing the competence development. By combining various methodological approaches, various perspectives and evaluation design are employed to give consideration

to the complexity of the construct and competence development. Thus, the instruments have to cover multiple dimensions.

The competence assessment has to happen in settings that allow showing competent behavior. The evaluation instruments have to provide the opportunity to reflect about the contents of trainings and the evaluation subject and as such reduce the complexity of counseling processes. Plus, they need to abide by the psychometric standards and the performance criteria.

The suggestions of systemic diagnostics and the established practices of this community may be taken up if they suffice the goal of this thesis. After all, the evaluation instruments and procedures have to be designed in a way that they find acceptance among the target group of counseling training associations.

Part II

Empirical Research

Chapter 7

Evaluation Design and Methods

This chapter introduces the methodology and the materials applied in this thesis. First, the objects of investigation are described. This is followed by a description of the materials. Furthermore, the evaluation design of this thesis is illustrated and the subjects of this evaluation characterized.

7.1 Objects of Investigation

Systems competence consists of six dimensions which list several entries. The number of these entries ranges between 7 and 26 (compare (Haken & Schiepek, 2006, pp. 671-673)). Thus, neither the complete construct, nor complete dimensions can be the object of investigation. For a thorough operationalization, only limited aspects can be taken into consideration. For this thesis, aspects of the dimensions 4, 5, and 6 were chosen; the dimensions 1 - 3 are not considered. The motivation for selecting this set of aspects is given in the following.

Dimension 1: Social Competences is a well-discussed construct (compare e.g. (Kanning, 2002)). This is reflected in numerous evaluation instruments and trainings in this area (compare page 82).

Dimension 2: This dimension includes a number of knowledge aspects which are not taken into account since basic knowledge of Synergetics from dimension 5 will be regarded. Generic Principle 6 (resonance, synchronization) is evaluated in combination all Generic Principles (dimension 4) an interview situation. The other aspects listed in this dimension are loosely attached abilities and skills. An exclusive training and evaluation of these aspects is not considered in favor of a more macroscopic approach.

Dimension 3: This dimension contains emotions, coping with stress, and resource activation. Evaluating "emotions and coping with stress" requires the in realistic evaluation settings to maintain external validity. Given such realistic situations as in counseling interviews the implementation of evaluation instruments covering emotions and stress is necessary, but considered

as a subsequent step when there are materials for evaluating the counseling process itself (as it is with the Generic Principles). Resource activation is considered very important in counseling, but it is not thought to be reasonable if it is evaluated solely unless integrated into a counseling interview.

For the reasons described above, the categories 1 - 3 are excluded from the competence evaluation and aspects of the dimensions 4 - 6 are chosen. From dimension 4 (Developing Conditions of Self-Organization), the Generic Principles are chosen, which basically make up this dimension. From the multitude of listed knowledge aspects in dimension 5 (Knowledge), basic knowledge of Synergetics is selected in favor of the other aspects. Finally, Idiographic System Modeling is selected from the number of listed methods and techniques in dimension 6 (Pattern recognition and Pattern Modeling). More detailed reasons for the selected aspects are described below:

7.1.1 Basic Knowledge of Synergetics

Dimension 5 (Knowledge) lists a number of knowledge aspects from different domains. For this thesis, basic knowledge of Synergetics is chosen. As the target group of the training includes participants in systemic counseling training and students of social and behavioral sciences basic knowledge of psychology and related areas can be assumed for most subjects. From the listed knowledge aspects in dimension 5, domain-independent knowledge aspects are chosen. The basics of Synergetics appears as the most generic and essential for counseling with a systemic focus.

7.1.2 Idiographic System Modeling

Idiographic System Modeling (see section 2.2.3) is a technique that represents systemic thinking in an exemplary way. The resulting system models show the interdependency of various elements plus indicating the direction of the causation. Circuits and sub-systems can be identified and the high number of interrelated elements supports thinking in terms of circular causation in favor of lineal causation.

Next to the resource interview (Haken & Schiepek, 2006, p. 673), it is the only technique mentioned of dimension 6 that is conducted during counseling. Therefore, it requires action competences. This, and the required systemic thinking, are the reasons for selecting this method.

7.1.3 Generic Principles

The Generic Principles (see section 2.2.3) serve as a guideline for choosing appropriate questions, interventions, and methods based upon the readiness of the client during counseling. They offer decision criteria to determine phases in counseling. As such, the Generic Principles can be considered as the core of systems competence. The other dimensions mentioned provide the

necessary abilities, skills, and competences to successfully conduct the Generic Principles. This is the main argument for selecting the Generic Principles as one component for training and evaluation. Furthermore, implementing the Generic Principles in a counseling interview allows a comprehensive look at a counselor's interviewing behavior, not only specific isolated aspects or techniques.

7.2 Materials

For each of the selected aspects - basic knowledge of Synergetics, Idiographic System Modeling, Generic Principles - evaluation instruments were developed. Each instrument was developed in iterative loops and discussed with experts. Before utilizing the materials for the first time, they were pretested by cognitive pretests (Rammstedt, 2006, p. 116). The understanding of the items and instructions was scrutinized with members of the target group.

The presented material operationalize aspects of systems competence (see respective requirement on page 103 and 105) and generate empirical data (see page 103 and 105). As such, they provide checklists for use in systemics trainings (see page 109). For the reasons of multiple measurements (see page 106) and process diagnostics (see page 108), the competence gain is not captured with biographies (see page 105).

7.2.1 Knowledge in Synergetics

WIGSY (Wissenstest für die Grundlagen der Synergetik) is a knowledge test on the basics of Synergetics. With a total number of 20 questions the essential definitions and understanding of systems, systemic counseling, and change processes are covered. The test is composed of multiple choice questions and open-ended questions. With regards to content, WIGSY is divided into five sub-sections: definitions, therapeutic attitudes, Idiographic System Modeling, Generic Principles, and base model of Synergetics. for the complete questionnaire see page 224.

The questions regarding Idiographic System Modeling and Generic Principles ask about the definition and intention about both concepts. The implementation of both is evaluated with separate evaluation instruments. WIGSY allows for the measurement of knowledge aspects. The scores gained with WIGSY are analyzed with respect to the knowledge gain and subgroup differences with means of repeated measures variance analysis.

7.2.2 Material Idiographic System Modeling

The material for the Idiographic System Modeling consists of three separate evaluation instruments. First, DIDSYM captures the assessment of a system modeling interview from the three perspectives counselor, client, and observer. Second, the evaluation sheet for DIDSYM captures the assessment of external raters of the video-taped interview. And third, the assessment of the system model's quality is conducted with a criteria list by an external rater.

DIDSYM (Dokumentationsbogen zur idiographischen Systemmodellierung) is the paperwork for documenting a counseling interview in which the method of Idiographic System Modeling is applied. The data capture the counselor's counseling process and the resulting graphical idio-graphical system model. The counseling process is reviewed from three perspectives: counselor, client, and observer. From each perspective the counseling process is assessed by means of an item list whose wording is adapted to each perspective. DIDSYM gives a short introduction into the method of Idiographic System Modeling since it can be used for inexperienced and experienced groups. It also provides instructions and protocol data (date, time, participants). Additionally, the counselor is asked to describe the interview's starting point and a sketch of the system model. For DIDSYM, see page 230. The assessment of the interview is captured by 16 items which are answered on a five-step agreement scale. Each interview participant is asked to give the assessment after the interview separately from the other participants. The concordance between the perspectives is calculated with Kendall's W. The intra-individual development is tested for significance with a repeated measures analysis.

The evaluation sheet (see page 235) consists of 18 items which evaluate the process of an Idiographic System Modeling from a higher level than DIDSYM does. The evaluation sheet comprises of items that are difficult to be answered by participants in training. It is utilized by external raters, when watching the videotaped counseling interview applying Idiographic System Modeling. Thus, there is a spatio-temporal distance to the actual interview. The items can be answered in five categories: an exclusion category which is rated when the respective behavior can not be observed. The other four categories describe the extent of the observed behavior. There is a criteria catalog with explicit descriptions for each of the items and for each of the four categories to facilitate the rating.

The criteria list assesses the quality of the system models created during the interview (see page 237). The assessment is conducted by an external evaluator who rate two groups of items. First, 13 items assess the quality of the model with respect to general aspects with four cate-gories. Second, 10 items assess presence of cybernetic criteria with respect to the occurrence of the respective criterion. Significant changes are calculated with Cochran's Q; the test for significant differences between TU and D8 is calculated with the Mann-Whitney test.

7.2.3 Material Generic Principles

The materials for the Generic Principles consist of DUGEP and an evaluation sheet for DUGEP. DUGEP captures the ratings from the three perspectives: counselor, client, and observer. The evaluation sheet for DUGEP provides the paperwork for coding the videotaped interview by external raters.

DUGEP (Dokumentationsbogen zur Umsetzung der Generischen Prinzipien) provides the pa-perwork for documenting a counseling interview focusing on the implementation of the Generic Principles. DUGEP (see page 240) gives an overview of the counseling behavior from three different perspectives: counselors, clients, and observer.

There are 23 items which operationalize the eight Generic Principles; each phrased for the

respective perspective. The content of the items stays the same for each. Since DUGEP can be used for inexperienced and experienced groups there is a short introduction into solution-oriented counseling describing the different roles counselor, client, and observer. As well, instructions for using DUGEP are given and protocol data (date, time, participants) are asked. DUGEP's 23 items are rated on a five-step agreement scale. The concordance between the perspectives is calculated with Kendall's W. The intra-individual development is tested for significance with a repeated measures analysis.

The videotaped interview is coded by external raters with respect to the implementation of the Generic Principles (see page 244). For every 2-minute interval the extent of each Generic Principle is rated: once for the observed intention of the counselor (IC), and second the observed reaction of the client (RC). Hence, the raters rate sixteen characteristics for each time interval. The extent of the observed behavior is rated by the means of four categories (low - high) and an exclusion category, when a certain Generic Principle can not be observed. To ensure adequate coding, the video is stopped after every time interval. For each Generic Principle, there is a detailed description how relevant counseling behavior and the reactions of clients for each Generic Principle can be observed.

The observed intensities of each Generic Principle are plotted in an Excel-diagram, showing the time interval on the x-axis and the intensities on the y-axis. This representation resembles the presentation of the items of RLI (Ratinginventar lösungsorientierter Interventionen) (Honermann, Müssen, Brinkmann, & Schiepek, 1999). For interpretation, a qualitative description and analysis of the run of the Generic Principles is conducted.

Similarity between DIDSYM and DUGEP   DIDSYM and DUGEP follow a similar approach in their design. Both rating lists provide the possibility for reflection of an interview (page 107) by minimizing its complexity (page 108). As well, they integrate the established practices of participant competence assessment by different perspectives and demonstrating the competences in live interviews and video (page 109 and 104). Both interview types adopt gaming simulation over other approaches of evaluating systems competence since they are set in counseling settings (page 104). Both procedures follow up a meta approach free from content, whereas the Idiographic System Modeling requires smaller search spaces than the implementation of the Generic Principles.

Figure 7.1 depicts the rating schema of DIDSYM and DUGEP. The interviewer and the client form a counseling system that is observed by an observer who is not directly part of the counseling system but yet present. All three participants use the rating scale to assess the interview when the interview is finished. The external rater rates the counseling behavior with spatio-temporal distance (page 108).

DIDSYM and DUGEP apply multiple methods: self-assessment, assessment by others (page 106), and observation (page 108). As quantitative evaluation instruments they have to conform with the standards of psychological and psychometric evaluation.
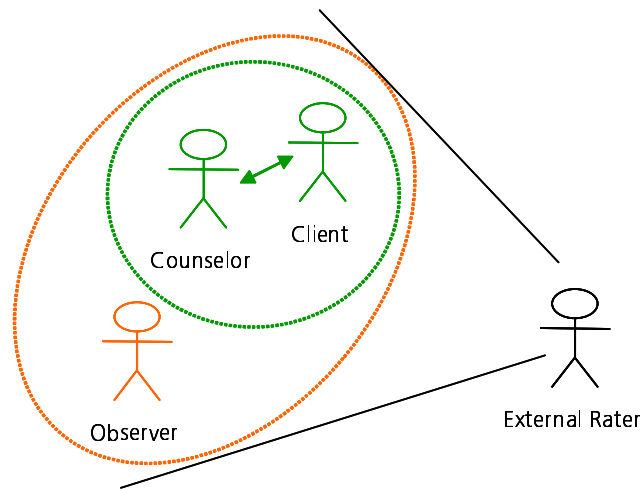
Figure 7.1: Rating Schema for DIDSYM and DUGEP

7.3 Evaluation Design

The previous sections describe the operationalization of the selected aspects of systems competence. The following section describes the target group for which the materials are intended as well as the training and evaluation schedule.

7.3.1 Target Group

The work conducted in this thesis aims to provide a counseling training for adults with respective evaluations instruments and give a guideline for measuring the competence gain. For this scope, two main target groups can be identified: participants in training programs for systemic counseling and university students. Acquiring the knowledge and the interview competences covered in this thesis is highly relevant for participants in systemic training programs. Being competent in systems should be a major goal in systemic training. The participants in such programs usually are required to have an academic degree in social or behavioral sciences, and a minimum number of years working in a profession in which systemic work is possible. As such it is a classical field of adult education. In German universities, systemic thinking and training is proportionally underrepresented. Nevertheless, prospective systemic counselors are educated there. Thus, they are part of the target group.

Training and materials have to be adequate for both groups. Despite the similarities of both groups with respect to the the academic background and the basic interest in working with human beings and in social contexts, they differ in one aspect: Students may have less interest and possibilities to put the training contents into action, since they are not working in a context that allows direct practicing. Participants in systemic trainings, however, may be less interested

in theoretical or conceptual input, while students may be less reluctant to learn since this is their major goal at university. Both groups are considered to have a strong interest in hands-on learning over sole theoretical input.

7.3.2 Training and Evaluation Schedule

The following two sections describe the implemented training and evaluation schedule. The materials described above require two different approaches in the evaluation which has to be taken into consideration.

The test result in WIGSY is achieved by a subject filling out the test individually, although the testing itself can be conducted in a group session if mutual influence is guaranteed to be excluded. The answers are evaluated and the test score reflects the subject's knowledge level. A subject's result in DIDSYM or DUGEP does not only depend on the subject's answers, though. These two evaluation methods require the assessment of different perspectives. Additionally, the interviews are videotaped. To capture each subjects' baseline in each of the three evaluation instruments, it is necessary to evaluate the subjects' competence level before any training takes place.

First, the training is characterized, providing an overview of the contents and describing the applied methods in the training. Second, the structure of the evaluation schedule is laid out.

Training Sessions

The complete training for the selected components consists of three consecutive training units: Knowledge, Idiographic System Modeling, and Generic Principles. The curriculum of the training follows the spiral approach (Bruner, 1960) in which each topic of a training is introduced at a very high level at first. The topics are repeated, and with each repetition enriched, broadened, and detailed. The training itself is conducted in two phases. Therefore, each training unit is divided into two subunits. The first subunit of each topic provides the basic knowledge and a demonstration of the underlying techniques and questions. The second subunit details and enriches the contents of the first unit.

This results in six training units, each taking four hours, with a total length of 24 hours. Additionally to the training, there are three sessions which frame the training: an orientation session, a midterm session, and a closing session. Each session takes about 70 minutes. They allow to conduct WIGSY as a group test. The orientation session introduces the basic ideas of systemic counseling and describes in short the content of the following training. The midterm session provides the possibility to summarize and review the topics covered in the first unit before starting with the second phase. The closing session reviews the training contents as a whole and also provides time for feedback from the group. Various techniques and settings are used for the trainings (page 106), among others: experiential learning (page 104) is part of each training unit. The training is intended to support self-organizational learning processes (page 103).

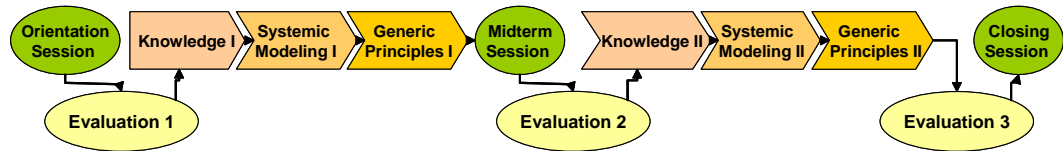The sequence of the training units is depicted in figure 7.2.

Figure 7.2: Sequence of Training Units

The three training units are described below in more detail:

Knowledge   The training unit knowledge gives the theoretical introduction for systemic think-ing and working. Especially, it focuses on the Synergetic approach, its basic logic, definitions, and relations. With several examples, the definition of system is illustrated, strongly focusing on recursively interlinked complex systems. The three main attitudes of systemic counseling customer orientation, solution orientation, and resource orientation are discussed, and their im-plications for the counseling process are derived. Experience-based learning techniques are uti-lized to demonstrate the forming of a stable order out of disorder (compare (Haken & Schiepek, 2006, p. 30)). The experiences of the role-playing are discussed using the base model of Syner-getics. (Haken & Schiepek, 2006, pp. 133-135). This demonstrates how order emerges without external influence, how the mechanisms of stabilization and destabilization work. Furthermore, the basics of constructivism are taught to create an understanding for different perspectives and realities. Different types of systemic questions are presented and rehearsed.

The second phase of this unit takes place after the midterm session. It repeats the basic defi-nitions and terms and provides further details of them. It also provides a deeper understanding how recursive systems operate and how they react to interventions. More exemplary types of questions are introduced - especially concerning goals and resources - and practiced in rehearsal interviews.

System Modeling   The unit system modeling provides background knowledge about the tech-nique of Idiographic System Modeling and trains the compilation of such a model. Starting from the definition of systems, the importance of using system models in counseling is discussed, next to the means of description and their utilization in the counseling process. The first unit presents a four-step process model to assemble the necessary information in order to transform it into a formal graphical model. A live-demonstration demonstrates the sequential steps of the method. First, the intention of each step is explained before demonstrating the interview technique. This also includes explaining various question techniques like contextualization and questions con-cerning input or output of a system element. Both types are useful for creating an idiographic system model. As well, guidelines for the creation of a system model and criteria for judging the excellence of the model are discussed.

The second unit is based on an interview transcription. It is used to focus on defining system elements and combining them into a system model. Several small groups work through the transcript and create a system model. A prototypical graphical system model is presented and the deviations from the groups' models are discussed. The differences between the groups with respect to the different approaches and the graphical model are covered.

Generic Principles   The first training unit introduces a case study and the exemplary use of each Generic Principle. The intention and description of every Generic Principle is given before discussing the usefulness of each Principle depending on the context of the counseling phase. Working in small groups, the understanding of each Generic Principle is deepened by developing questions for each Principle. Visual and auditive cues of the clients are identified to help the counselor to choose for one or the other Generic Principle.

In the second phase, a case study is presented which is to be continued in rehearsal interviews. Each Generic Principle is trained separately by picking up the case study and focusing on conducting one Generic Principle. The different outcomes and approaches of the various groups are compared and discussed.

Evaluation Sessions

Each evaluation round consists of three separate tests: WIGSY, DIDSYM, and DUGEP. WIGSY is conducted as a group testing in the orientation, midterm, and final session. The participants fill out the test at the end of each session. Between each session and each training phase there is enough time to conduct DIDSYM and DUGEP. For this purpose, peer-groups are formed. Conducting DIDSYM and DUGEP is a rather time-consuming procedure. Each member of a peer-group has to conduct one interview as a counselor in DIDSYM and DUGEP. Plus, each member participates in the interviews of the other peer-group members either as client or observer. Therefore, DUGEP and DIDSYM are conducted during the off time of the participants; the order in which those interviews are conducted is not specified. Figure 7.3 depicts the sequence of the evaluation rounds. The time intervals between the evaluation sessions are within a few weeks. Thus, the competence development is monitored for a short-term period, especially for the run of the training and a short time after it (see section 3.3.1 on page 73).
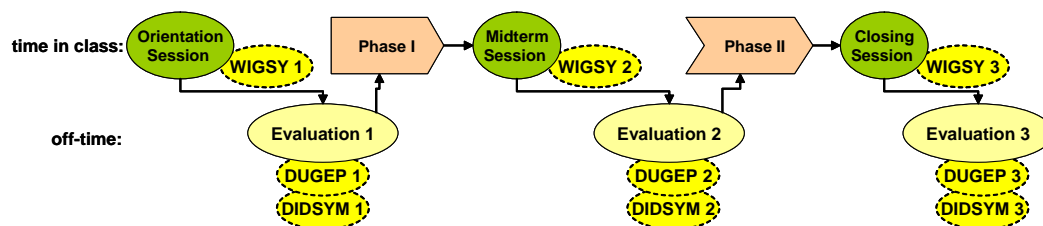

Figure 7.3: Sequence of Evaluation Units

7.4 Summary

For the scope of this thesis, three aspects are for the operationalization and evaluation: basic knowledge of Synergetics, Idiographic System Modeling, and Generic Principles. These aspects are the most promising for evaluating them in counseling interviews in order to show the gain of competence as a holistic process rather than isolated competence facets. For each of the aspects, training units and evaluation instruments are developed.

The materials for evaluating the basic knowledge of Synergetics consists of a knowledge test (WIGSY) asking for the basic definitions, concepts and relations of systemic counseling from a Synergetic point of view. The Idiographic System Modeling is realized in an interview. The counseling process and the result of the interview is assessed from three perspectives (counselor, client, observer) with DIDSYM. The graphical system model is rated by an external rater as well as the videotaped interview. The implementation of the Generic Principles (DUGEP) is evaluated similarly. The process of a solution-oriented interview is assessed from three perspectives and the videotaped interview by external raters. There are two training rounds, framed by an orientation session, a closing session, and a midterm session separating the training rounds. The training follows the spiral approach and allows detailing each aspect in the second round. WIGSY is conducted in each of the sessions, while DUGEP and DIDSYM are conducted in peer groups in-between the sessions. The target group of the training and the evaluation instruments are participants in systemic training institutions and university students. For the sample of this thesis, two groups were selected that fit into this conceptualization.

7.5 Subjects

Two groups of subjects form the sample for this thesis. First, a group of students who attended the training as part of their university education. Second, a training class of participants in a systemic training institution.

7.5.1 University Students

The group of students was selected from Technische Universität Darmstadt (Darmstadt University of Technology), a public university providing studies in engineering, natural sciences, and humanities. The training was held as a teaching assignment in the curriculum of the department of psychology. The course (abbreviated TU) was offered to students having passed their intermediate exams and also open to students from other disciplines within the humanities faculty. The participation in the class was completely voluntary since there were no certificates issued, which could be used by students for their degree program. Full classes then often show a high intrinsic motivation of the participating students.

7.5.2 Systemic Training Institution

A training institution for systemic counseling was incorporated, that was founded in 1995 and located in Darmstadt. The institute's portfolio comprehends two courses: Systemic Counseling and Advanced Methods. The focus of the institute is influenced by the solution-oriented and resource-oriented approach (Berg & Jong, 2003; Berg, 1994; Shazer, 1985), following the philosophy to provide as little theoretical input as necessary with a maximum of hands-on activities to practice counseling in varying situations. Thus, role-play is a major teaching method.

The participants for the training and the evaluation of this thesis' training were recruited from two classes of the basic course Systemic Counseling in the courses D7 and D8. The numbering indicates the succession of the courses with a lag of 12 months. All members of D8 received the full training and they took part in the complete evaluation scheme. Participants from D7 volunteered to participate in one evaluation round, and thus, provide reference data.

7.5.3 Characterization of Random Sample

Table 7.1 describes the composition of the sample (TU and D8) along the categories test condition, gender, and profession. The category "Others" includes professions like teachers, social workers and students with a different background. Both test conditions have the same number of participants. The age of the participants ranges between 21 and 48. The members of TU all ranged in their twenties, the age of the D8 members show a higher variance in age.

	TU		D8		
	male	female	male	female	**Total**
Psychology	2	5	0	6	13
Education Science	3	6	0	3	12
Other	0	1	1	7	9
Total	5	12	1	16	34

Table 7.1: Characterization of Sample

The participants of D7 are not mentioned in table 7.1 since they only took part in the first measurement.

Chapter 8

Results

This chapter presents the results of the evaluation of the training conducted. The results are presented separately for each aspect.

There are some abbreviations which are used throughout this chapter: The group of university students is abbreviated as TU, the training group of the systemic training institution as D8. The findings of the reference group is abbreviated as D7. To facilitate the description of the evaluation, the three points of measurement are abbreviated with the Roman numerals I, II, and III.

The results of D7 are used as reference data. This group did not receive any training, thus the data can only be compared at the first measurement. Since D7 has had more experience with solution-oriented counseling than the other two groups, the reference data can hint how this experience reflects in the results. There are enough subjects who took part in the knowledge test WIGSY in order to calculate statistical analysis. For DIDSYM and DUGEP, there is no sufficient number of subjects for statistical analysis. Thus, the reference data can only be understood as an indicator.

8.1 Knowledge in Synergetics

In the following section, the results of the knowledge test WIGSY are presented. First, an overview of the knowledge gain for the whole test is given before the results are depicted in more detail for each sub-section of the test (definitions, attitudes, Idiographic System Modeling, Generic Principles, Synergetics). The most important findings are summarized at the end of this section.

The diagrams presented in this section depict the knowledge gain across the three measurements for TU, D8, as well as the average of all subjects. The results for D7 are not considered in

the diagrams but described in the context of each analysis. In the diagrams, the y-axis represents the full score obtainable for the entire tests or the respective sub-section.

8.1.1 Knowledge Gain - Overview

Figure 8.1 depicts the knowledge gain across the three measurements for both groups (TU and D8), as well as the average score of all subjects. At I, the initial position for all subjects is the same since there is no significant difference. For the second measurement II, there is a significant difference at 0.05-level, due to the higher learning rate of TU over D8 (18.2 vs. 12.4 percentage points from I to II). This difference disappears at III, this time due to the steeper learning rate of D8 (18.0 percentage points) over TU (16.9 percentage points).
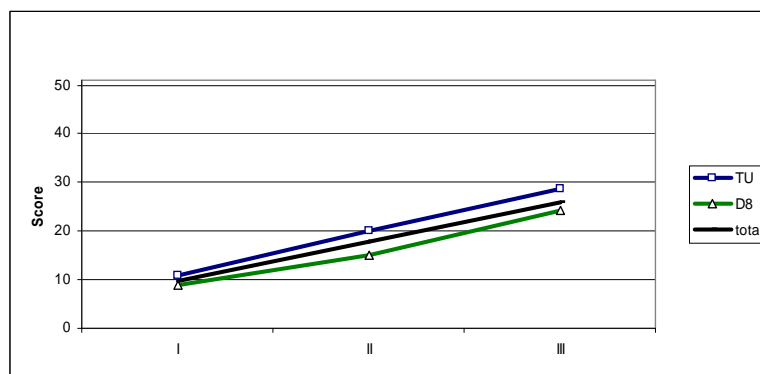

Figure 8.1: Scores WIGSY

At I, the score of D7 lies between the two subgroups TU and D8, and thus, all scores are comparable with each other.

The repeated measures analysis of variance for the complete test shows that the knowledge gain is highly significant at 0.01-level. The revealed learning trend is linear and highly significant (0.01-level), as figure 8.1 indicates. There are different trends for the single subsections, though.

8.1.2 Knowledge Gain - Subsections

WIGSY is structured into five parts: definitions, attitudes, Idiographic System Modeling, Generic Principles, and Synergetics. In the following, the results for each area are presented. In each diagram, the y-axis represents the maximum score achievable.

Scores Definitions

With respect to the definitions, it shows a slow rise from I to II (7 percentage points), followed by a steeper rise to III (19,5 percentage points) for the total group (see figure 8.2). TU and D8

have very similar learning developments which results in 45,9 % of the obtainable score at III for the total group. The score of reference group D7 lies between TU and D8, close to the average at I.
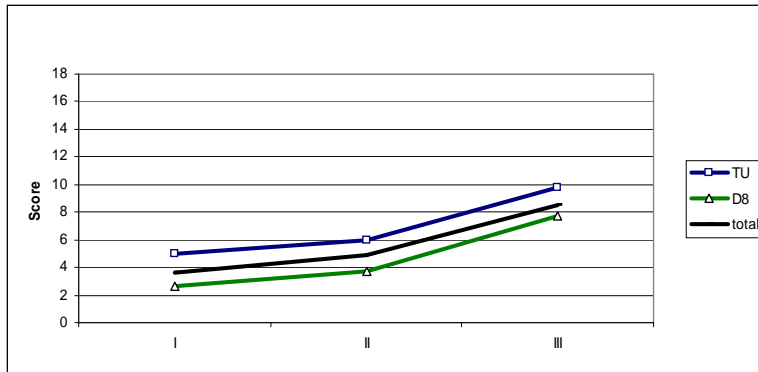

Figure 8.2: Scores Subsection Definitions

The differences between TU and D8 are significant at 0.01-level at I and II but not at III. The learning progression for both groups is very similar across the measurements.

Scores Attitudes

This area is an exception, because it is the only one in which the scores of D8 lie above the ones of TU, although there are no significant differences between both groups (see figure 8.3). For the total group there is a knowledge gain of 25.6 percentage points from I to III.
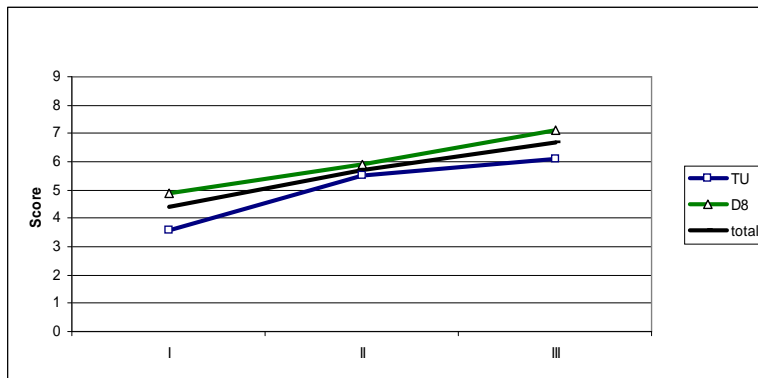

Figure 8.3: Scores Subsection Attitudes

The reference score of D7 equals the score of D8. The finding that the scores of D8 lie above the ones of the university students supports the validity of the test since the three concepts

customer orientation, solution orientation, and resource orientation are strongly focused on in the curriculum of the systemic training institution.

Scores Idiographic System Modeling

For this area, there is a steep rise from I to II (33.3 percentage points) and a slower rise from II to III (10 percentage points). With similar initial and final scores, there is a significant difference at II (0.05-level), due to the less pronounced knowledge gain of D8 compared to TU (figure 8.4).
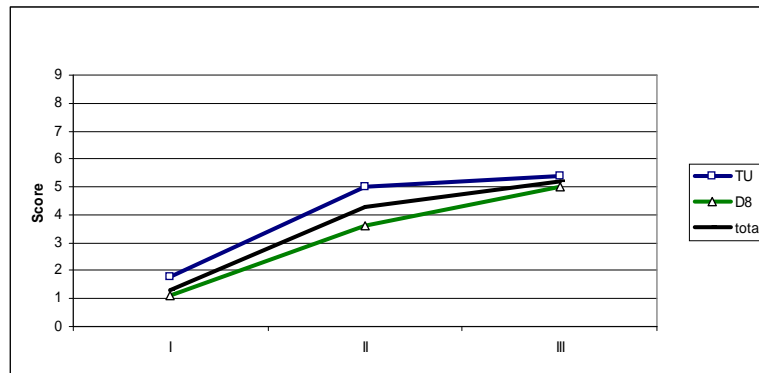

Figure 8.4: Scores Subsection Idiographic System Modeling

As for the other areas, the score of D7 is similar to the one of D8. There is no significant difference between the D7 and the other two subgroups.

Scores Generic Principles

The concept of the Generic Principles entirely unknown at I, since all subgroups obtain a score of 0 in this area (see figure 8.5). The learning development is quite homogeneous, which results in insignificant score differences, although TU seems to profit more from the training in the second round: TU gains 41.4 percentage points from II to III, whereas D8 gains 27.1 percentage points.

Scores Synergetics

Also, in this area, the scores of TU are higher than D8 (figure 8.6). With comparable initial scores at I, for this area TU has a much steeper learning curve compared to D8. The overall gain of 34.7 percentage points from I to III is higher than the gain of D8 (16.0 percentage points). This is reflected in the statistics as well: At II and III, there is a significant difference between both groups at the 0.01-level. Again, the scores of D7 are very similar to the ones of D8 at I.
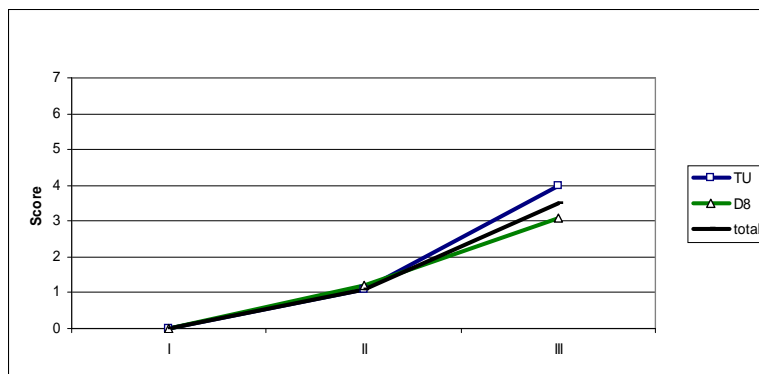
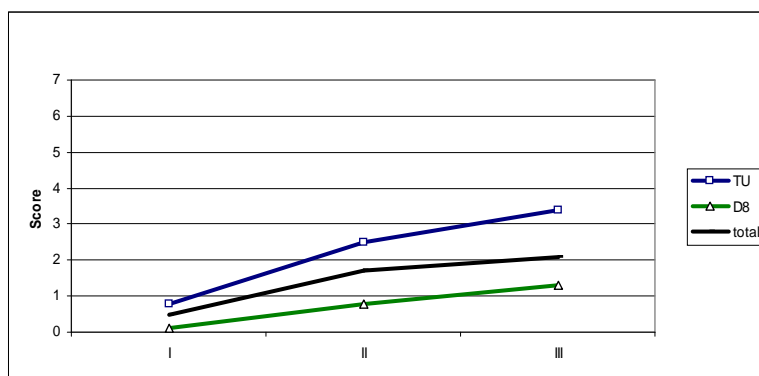Figure 8.5: Scores Subsection Generic Principles

Figure 8.6: Score Subsection Synergetics

The theoretical nature of this area is managed more successfully by the university students. The participants of D8 may neglect this area more since the direct usage of this theoretical model in counseling may not be considered important. The university students may be more skilled in learning theoretical frameworks, and thus, excel in subjects with a more pragmatic orientation.

A factor analysis was conducted to see if the five parts of WIGSY are reflected in the data. At I, a factor analysis can not be calculated since there are too many variables that do not have any variance. This arises from the fact that no scores were attained for the following variables: definition for equifinality, hysteresis, and conditions for self-organization, and the definition and usage of the Generic Principles.

At II and III, a confirmatory factor analysis (principal component analysis and varimax rotation) does not reproduce the structure of the knowledge test. Although an explorative factor analysis (principal component analysis and varimax rotation) can not reproduce the structure either, it shows that from II to III, there is a reduction of extracted factors from 7 to 6 which

can be interpreted more in the sense of the intended test structure. As a conclusion, it has to be stressed that the intended structure of WIGSY can not be reproduced with this random sample.

8.1.3 Relation Between Knowledge and Interviews

In anticipation of the results of DIDSYM and DUGEP, the correlation between the scores of the respective subsections of WIGSY and some results of DIDSYM and DUGEP are presented.

Idiographic System Modeling For the comparison of the mutual influence between various scales of DIDSYM the scores of the knowledge test WIGSY, several indicators are calculated. With DIDSYM, for every measurement a new scale was calculated: quality of the graphical system model (sum of the rating values), external raters (sum of the ratings), and for each perspective (sum of the ratings). For WIGSY, the total score and the score for the subsection for the Idiographic System Modeling is taken.

It shows, that the total score of WIGSY highly correlates (0.01-level) with the score of the subsection Idiographic System Modeling, but there is not significant correlation between a knowledge score and any other indicator of DIDSYM. The correlations are all very low.

Generic Principles For the comparison of the knowledge about the Generic Principles and their implementations, indicators are calculated for each perspective (sum of the ratings), as well as the total score and the score for the subsection for the Generic Principles.

As for the Idiographic System Modeling, there is no significant correlation between a knowledge test indicator and a DUGEP indicator. The total score and the score of the subsection Generic Principles correlates only at the third measurement (0.01-level). The correlations between the indicators are higher than the ones for the Idiographic System Modeling.

It shows, that the extent of theoretical knowledge about a given procedure or concepts does not correlate with the implementation of those. Not even more training or experience has an influence on this correlation. There is neither an enhancement or an inhibition between knowledge and the implementation. They are more or less independent from each other.

8.1.4 Conclusion

The scores of D7 are basically similar with the scores of TU and D8 at the first measurement showing no significant differences. This indicates that there is no advantage of more experienced participants over beginners with respect to the basic knowledge of Synergetics. With respect to the explicit knowledge, all subjects of the random sample have the same initial positions.

The higher ratings of D8 (and D7 at I) in the area "Attitudes" is an exception. Considering that solution orientation, resource orientation, and customer orientation are basics for any systemic training and were taught in D8 and D7 at a very early stage it is surprising, that the difference of these two groups to TU is not more pronounced. Two factors can be identified: a) students who participated in the lecture are interested in systemic counseling and may already have some

experience, and b) the three questions of this area are multiple choice questions. Thus, some correct answers could be subject to guessing.

For the complete test, the average of the correct scores lies at 51 % at III (see table 8.1). This results in knowledge gain of 33 percentage points from I to III. No subject receives the maximum score of 51 points. A maximum of 81 % was achieved by one person at III. Thus, the overall learning outcome of 51 % after two training rounds is quite moderate, for TU a little higher than for D8. The learning curve for the total group follows a linear trend. Broken down into the five areas, different learning behavior becomes apparent. A statistically firm statement about the learning behavior is that TU profits more from the first training round than D8, and learns less in the second training round. The advance of TU is diminished at III. This finding does, however, not apply for the area Synergetics in which TU is significantly better at II and III, and can even increase the difference.

Considering the knowledge gain, there are obvious differences of how the participants profited more from one training than in another. The area "Generic Principles" has the greatest gain, followed by "Idiographic System Modeling". The sections "Definitions", "Attitudes", and "Synergetics" profit less from the two training rounds, although "Attitudes" has the highest score of all. But this is due to the high initial score. It shows that the more theoretical a sub-section the lower the final score (sections "Synergetics" and "Definitions"). The relative high knowledge gain in the sections "Idiographic System Modeling" and "Generic Principles" may be attributed to the fact that they were practiced in interviews and thus were more present and important than the other areas.

	Intial	End	Overall Gain	sign. improvement
Definitions	19.5	45.9	26.4	**
Attitudes	48.9	74.4	25.5	**
Idiographic System Modeling	14.4	57.8	43.4	**
Generic Principles	0	50.0	50.0	**
Synergetics	6.7	28.0	21.3	**
WIGSY	19.2	50.8	31.6	**

Table 8.1: Knowledge Gain and Significant Improvements in WIGSY
The numbers indicate the percentage of the total score in the respective sub-section and the knowledge gain
* / ** indicate significant differences (0.05-level / 0.01-level)

As the data reveal, the scores of TU lie above the scores of D8 with one exception in the area of attitudes. Although, this finding is only significant at II, the data pattern is reproduced through all areas and at all measurements.

Table 8.2 lists the significant differences between TU and D8 in the sub-sections of WIGSY and for the complete test.

	I	**II**	**III**
Definitions	**	**	*n.s.*
Attitudes	*n.s.*	*n.s.*	*n.s.*
Idiographic System Modeling	*n.s.*	*	*n.s.*
Generic Principles	1)	*n.s.*	*n.s.*
Synergetics	*n.s.*	**	**
WIGSY	*n.s.*	*	*n.s.*

Table 8.2: Significant Differences between Subgroups in WIGSY
1) No calculation possible, all scores 0
* / ** indicate significant differences (0.05-level / 0.01-level)

8.2 Idiographic System Modeling

This section presents the results for the Idiographic System Modeling. The findings for the data sources DIDSYM, the evaluation sheet, and the quality of system models are described separately. First, though, the development of the interview duration is discussed.

8.2.1 Interview Duration

The interview duration is considered as a measure for the development of counseling competences since it reflects a counselor's ability to maintain an interview.

For the Idiographic System Modeling, there is a general upward trend. From the first to the second measurement, the duration increases for the members of TU, whereas for D8 there is a decrease. For the total group, this reflects in the decrease from I to II and an increase from II to III.

This decrease in D8's interview duration can be explained when considering the interview duration of one single peer group. With a mean duration of 53 minutes, this peer group held much longer interviews than other peer groups. As a motivation, the peer group stated, that "they wanted to produce much material for coding, but they would reduce the interview duration after this experience" (statement of participant DOKL54). It is highly likely, this relates to the experienced effort conducting all interviews in one peer group session. The extreme duration of the first measurement also shows in the average of this group over all measurements which is only 28 minutes. A further reason for the shorter interview duration from II on is that they used the material of DUGEP for the first phase of the Idiographic System Modeling (narration). Thus, for DIDSYM the interviews started right away with the second phase (collecting elements). For this reason, the interviews of this peer group became shorter in comparison to the first round.

If the overall average duration is adjusted by eliminating this peer group for DIDSYM I, the duration drops to 26.6 minutes for D8 and 22.9 minutes for the total group. The adjusted data now show a constant progression for all groups. The influence of these outliers also shows

in the repeated measures variance analysis. Unadjusted, there is no significant progression in interview duration for the total group. By adjusting the data, the significant increase of the duration becomes apparent.

Table 8.3 depicts the interview duration for DIDSYM at all three measurements. The adjusted duration for I is listed in brackets, as well as the influence on the significant progression of the interview duration.

	Duration (in min)			*sign.*
	I	**II**	**III**	
TU	18.7	21.3	29.2	*
D8	33.6 (26.6)	29.6	35.0	*n.s.* (*)
Total	25.9 (22.9)	25.4	32.4	*n.s.* (*)
sign.	**	**	*n.s.*	

Table 8.3: Interview Duration, DIDSYM
Adjusted and unadjusted results
* / ** indicate significant differences (0.05-level / 0.01-level)

The duration of the interviews conducted by TU is significantly lower than D8's for the first two measurements. The lower level is maintained at the third measurement, but it is not statistically significant.

With 35.3 minutes, D7 has the longest interviews at the first measurement. This shows that this group has the competences for interviewing a considerable length of time and almost twice as long as TU, the group that had almost no experience.

8.2.2 Ratings by Participants

The interviews are documented with DIDSYM, which contains three rating lists with 16 items on each list. Each list contains the same content, but from a different perspective (counselor, client, and observer). The items cover the process and the result of the Idiographic System Modeling. This provides self-assessment data by the counselor and assessment by others (client and observer).

At first, this section presents the concordance of the ratings before it contrasts the results of the ratings. Lastly, the factorial structure of the gained data is discussed.

Concordance

The ratings given in DIDSYM reflect a rater's attempt to observe relevant behavior, categorize it, and assign numerical values according to this observation. This capacity for judgment may depend on many intraindividual variables and on various influences of the social situation, as well as an underlying learning process. There is no formal training in which the training participants

can learn, discuss, or reflect the categories of DIDSYM - unlike the training for the external raters who code the video-taped interviews. The discussion of the different observations after the rating is preferable in a learning context to enhance the understanding of items and observed behavior within a peer group.

The concordance is an indicator for the mutual consent between different raters. The accordant coefficient Kendall's W ranges between 0 and 1. 0 means no mutual consent and 1 means complete mutual consent between the raters. For DIDSYM, the concordance between the three perspectives counselor, client, and observer are calculated. A high mutual consent (concordance) indicates that similar behavior is rated with similar categories. An increasing concordance means that the ratings become more similar and the rating behavior becomes more conform. A decreasing concordance shows that that rating behavior differs more and more between the raters.

Figure 8.7 depicts the development of the concordance. It summarizes over all items at each measurement.
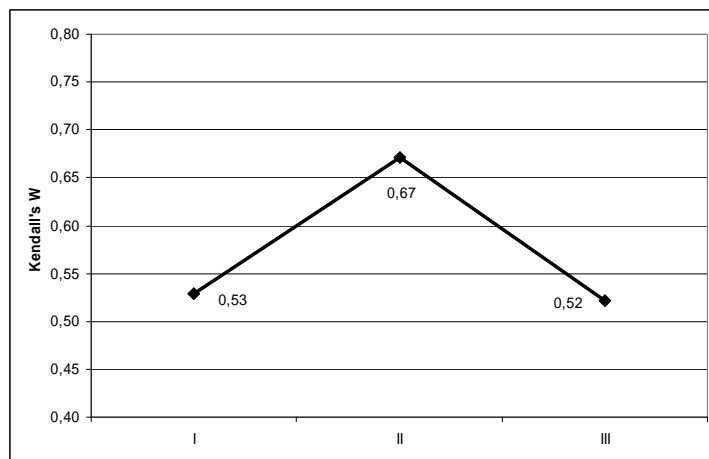

Figure 8.7: Concordance of Ratings in DIDSYM

The concordances for the three measurements are moderate, as they range between 0.52 and 0.65. The increase of the concordance from 0.53 at I to 0.65 at II is considerable but also the following decrease of concordance to 0.52 at III.

The increase of concordance from I to II shows that the rating behavior conforms after the first training round. The second training, though, seems to evoke differences in the rating behavior since the concordance drops to its initial state. Observed behavior is rated less concordant at III than at II.

Self-Assessment and Assessment by Others

DIDSYM generates data that allow two questions to be answered. First, how is the development for each perspective and, second, how do the different perspectives differ in their assessment. The data are structured by subgroups first, and later by perspective.

Assessment and Subgroups Table 8.4 presents the means for each of the 16 items at each measurement looking at differences between the subgroups. The answer scale ranges from 1 (no agreement) to 5 (total agreement). Significant differences between subgroups are indicated in the column behind the respective mean. Significant developments from I to III are indicated in the very last column. The intra-individual development is tested for significance with a repeated measures analysis. The Greenhouse-Geisser test is applied, since it is conservative and for small sample sizes.

For all items at all measurements, the items range from 2.1 to 4.5. The total means across all items for each measurement range from 3.6 to 3.8. As such, they are located well within the positive section of the answer scale. The ratings are on a high level from the first measurement on and this level is maintained across the measurements. There are two exceptions, item 4 (aspects missing) and item 14 (counselor made interpretations).

There is a general upward trend for all items. The only item that shows a decrease at all - item 14 (counselor made interpretations) - reflects the fact that the counselors reduce the degree of interpretations in the interview. This general positive trend is supported by the significant positive development of six items. These findings are also supported by a prepost comparison between I and III. Both analyses basically come to the same result.

As table 8.4 shows, there are almost no significant differences between TU and D8 in the ratings of the interviews. Subgroup differences do not have to be considered in the assessment of the Idiographic System Modeling. The only two significant differences can be found at measurement III.

As there are no major differences between the subgroups D8 and TU, the means are not depicted in a table in the following. The reference data of D7 do not vary any from the data of the rest of the group. Therefore, they are not presented separately.

Assessment by Perspective This section presents the data of the assessment for the Idiographic System Modeling from a different perspective and structures the data along the three perspectives (counselor, client, observer). The item set and the answer scale (1 - 5) remains the same. As there are only minor significant differences between the perspectives, the mean across all items is given per measurement in table 8.5. The significant differences are described further below.

At I, two items show a significant difference between the perspectives: item 4 (aspects missing; counselor ratings higher than client ratings), and item 13 (counseling made client feel confident; counselor ratings higher than client and observer ratings).

	I		II		III		sign.
	mean	**sign.**	**mean**	**sign.**	**mean**	**sign.**	change
1) Client has a better overview than before	3.9		4.3		4.4		* +
2) Counseling made clients conscious of strengths	3.0		3.2		3.7		* +
3) Counselor took up client's wording	4.0		4.0		4.2		
4) There are aspects missing	2.4		2.5		2.4	* (TU)	
5) Counseling made the client feel better	4.4		4.4		4.5		
6) Client gained new insights by modeling	3.7		4.0		4.0	* (D8)	
7) Client has more clarity about own wishes	3.7		4.0		4.1		
8) Client knows ways for self-help in difficult situations	3.2		3.5		3.5		
9) Client knows what to work on next	4.2		4.2		4.2		
10) Client felt understood	4.1		4.3		4.4		+
11) Client has a better understanding of living contexts	3.4		3.6		3.8		* +
12) Client became aware of hidden chances	3.3		3.5		3.6		
13) Counseling made client feel confident	3.6		3.9		4.0		* +
14) Counselor made interpretations	2.5		2.2		2.1		* +
15) Counseling motivated client	3.9		4.1		4.0		
16) Modeling did not confuse client	4.3		4.3		4.4		
Average Level	3.6		3.7		3.8		* +

Table 8.4: Self-Assessment and Assessment by Others structured by Subgroups in DIDSYM
* indicate significant changes (repeated measures).
+ indicate significant changes (pre and post test; I vs. III)

	I	**II**	**III**	**sign. change**
Counselor	3.5	3.7	3.7	
Client	3.6	3.7	3.9	+
Observer	3.6	3.9	3.9	+

Table 8.5: Average Assessment by Perspective in DIDSYM
* indicate significant changes (repeated measures).
+ indicate significant changes (pre and post test; I vs. III)

AT II, items 4 (aspects missing; counselor ratings over client ratings), and 14 (counselor made no interpretations; counselor ratings over client ratings) are significantly different.

At III, there are four significant differences: Item 4 (aspects missing; counselor ratings over client ratings), item 10 (client felt understood; client ratings lower than other ratings), item 14 (counselor made no interpretations; counselor ratings higher than other ratings), and item 16 (modeling did not confuse client; client ratings higher than counselor ratings). The differences between the perspectives do not follow a specific pattern, with two exceptions: counselors continuously report that there are aspects missing in the system modeling to a higher extent than their clients. As well, counselor have the impression that they are making interpretations to a higher extent than the clients or the observers.

A repeated measure analysis does not show a significant improvement, whereas a paired sample t-test shows a significant improvement from I to III for the ratings of the clients and observers. The counselors do not report about an improvement of their own counseling behavior though.

The level of all means lies in the agreement area of the answer scale. Right from the first measurement on, the interview is assessed quite positively by all perspectives. An improvement can be observed for all, although it does not show in the repeated measure analysis and only for client and observer.

The means in table 8.5 characterize the general item level for each perspective. For a more detailed view on the position of the items, table 8.6 describes the items that have a constant low or high position in the group of all items. For this purpose, the quartiles for the distribution of each perspective and measurements is calculated. Items, that are in the 25th or 75th percentile at all measurements are listed in table 8.6. They make a statement about the general position of these items grouped by perspective.

All other items range within the middle quartiles. As can be seen, there is a stable set of items that either range in the lower or upper quartiles at all measurements. These items are selected when they appear at least in two of the perspectives. The constant low rated items are:

- aspects missing (4)
- client became aware of hidden chances (12)
- no interpretations (14)

The constant high rated items are:

	Low Rated Items (P 25)	**High Rated Items (P 75)**
Counselor	2 (Counseling made clients conscious of strengths) 4 (aspects missing) 12 (Client became aware of hidden chances) 14 (no interpretations)	5 (Counseling made the client feel better) 9 (Client knows what to work on next) 16 (Modeling did not confuse client)
Client	4 (aspects missing) 8 (Client knows ways for self-help in difficult situations) 14 (no interpretations)	5 (Counseling made the client feel better) 10 (Client felt understood) 16 (Modeling did not confuse client)
Observer	4 (aspects missing) 12 (Client became aware of hidden chances) 14 (no interpretations)	5 (Counseling made the client feel better) 10 (Client felt understood) 16 (Modeling did not confuse client)

Table 8.6: Relative Position of Items in DIDSYM

- counseling made the client feel better (5)
- client felt understood (10)
- modeling did not confuse client (16)

Factorial Structure

DIDSYM is not developed along a factorial structure. They are a compilation of important aspects in the process of Idiographic System Modeling. As such, a confirmative factor analysis for identifying underlying factors can not be conducted, but an explorative factor analysis is calculated to reveal the internal structure of the items.

The overall results of the factor analyses show that there is no underlying, systematic structure at the different measurements or the three perspectives. Several explorative factor analyses have been calculated differing in the data base and the underlying question. They all follow the same analysis schema: The principal component analysis is applied as the extraction method, for the rotation method, varimax with Kaiser normalization is applied. The detailed results are explicated in the following.

A set of nine factor analyses - one for each perspective (counselor, client, observer) and each measurement (I, II, III) - does not show any kind of systematics. Neither is there a systematic structure for each perspective at each measurement, nor a common structure between the per-

spectives at each single measurement. Although, there is no common factorial structure between these nine factor analyses, there is one commonness: 8 of the 9 analyses extract five factors upon the Eigenvalue criterion.

Two sets of factor analyses on a higher level come to similar unsystematic results. First, there are three explorative factor analyses summarizing all perspectives at the same measurement. This is possible to the same items answered from each perspective. The second set summarizes the answers of one perspective across all three measurements. The results of these calculations are basically the same as mentioned above. There is no systematic structure found and a small set of items seems to have frequent intercorrelations, but there is not enough evidence to define them as a common factor. Again, a common characteristic for these two sets are the common number of extracted factors. For both sets there are four factors in each case.

These non-systematic findings are not surprising and are to be expected since the total number of subjects is very low. There are not enough subjects for a serious interpretation of the results of the factor analyses. Thus, these findings can not be interpreted. Even if there had been found meaningful systematics, an interpretation would not have been possible without further validation.

Summary

The ratings by the participants show moderate concordances between the three perspectives counselor, client, and observer. The concordance increases from I to III considerably, but falls back at III to its initial level of 0.52.

The ratings by the participants are on a high level right from I on. There is an improvement from measurement to measurement which shows in significant developments for some items. In general, there is a positive development for all items. Both subgroups (TU and D8) can be considered similar in their rating behavior, as there are no meaningful differences. The more experienced participants of D7 do not rate their counseling behavior any different from the other participants.

The counselors do not see an in improvement in their counseling behavior across the measurements. Whereas, clients and observers see an improvement from the first to the third measurement. There are no specific items that prove responsible for this increase, it is reflected more in the general level of the items. An item set of constantly low and high rated items can be identified, though.

A factorial structure can not be identified within the data structure independent of the grouping characteristics (measurement or perspective).

	Kendall's W
1	0.71
2	0.98
3	0.91
4	0.86
average	0.87

Table 8.7: Inter-Rater Reliability, DIDSYM

8.2.3 Ratings by External Raters

The videotaped were assessed by an external rater. In total, there are 91 interviews documented with DIDSYM. Two raters coded the observed counseling behavior according to a coding catalog developed beforehand.

In order to assess the quality of the raters' codings, the inter-rater reliability is calculated. For DIDSYM, it is calculated from four test ratings at the end of the raters' training phase.

This section discusses the inter-rater reliability before presenting the results of the rater assessments.

Inter-Rater Reliability

The inter-rater reliability of DIDSYM is calculated with Kendall's coefficient of concordance (Kendall's W) and depicted in table 8.7. For the interviews Kendall'W ranges from W = 0.71 - 0.98. The first rating with W = 0.71 is by far the lowest,; the other concordance coefficients rank considerably higher. The average of all four test interviews equals W = 0.87. In spite of the outlier of the first rating, the average can be considered as quite good. There is a high similarity of the rating behavior of both raters.

Comparing the inter-rater reliability (table 8.7) and the concordance between the interview participants (figure 8.7) the different levels of both measures of rater concordance becomes obvious. The concordance - as a measure of the mutual consent of the ratings between counselor, client, and observer - is lower compared to the inter-rater reliability. This is due to the training status: The inter-rater reliability of the external raters is calculated after intensive trainings and discussion about the items and the underlying concepts. The concordance reflects the mutual consent between untrained raters.

Rater Assessment

The DIDSYM interviews are assessed with the aid of 18 items describing relevant system modeling behavior. The items are rated by external raters after watching the video-taped interview.

There is a coding catalog that describe relevant behavior for each of the answer categories. There are five categories including one exclusion category when none of the relevant behavior can be observed. The other four categories rate the extent of the observed behavior in different degrees, ranging from 1 (low) to 4 (high). This allows the dichotomization of the ratings into two categories, depending on the occurrences: non-observable behavior (exclusion category) and observable behavior (category 1 - 4).

This section is structured into two parts. The first part discusses the development of the occurrences for each item at each of the measurements (listed in table 8.8 on page 144). This examination answers the question if there is more observable counseling behavior with each measurement. The second part discusses the development of the levels of the occurred items across all measurements (listed in table 8.9 on page 147). This examination answers the question if the rating level of the observed items increases with each measurement.

For each part, the subgroup differences and the competence gain throughout the training are described.

Occurrences   Table 8.8 shows the percentage points of the occurrence for each item summarized over all subjects. Significant differences between the subgroups TU and D8 are listed in the column "sign.". The cell is left blank when there is no significant difference. The abbreviation in brackets shows which subgroups receives higher ratings. The last column "sign. change" lists two indicators for a significant development throughout the training: A "*" indicates significant development considering all three measurements. A "+" indicates significant changes between the first and the third measurement, thus, representing a classic pre-post test comparison. The results D7 are not considered in table 8.8 but discussed in section 8.2.3 on page 146.

The general level of the occurrences is rather high right from the first measurement. Calculating the overall level of the occurrences for the first measurement, it results in 68.1 %. This - already high - level increases to 78 % by ten percentage points at II. From II to III, there is a negligible increase up to 78.9 %. This means that for many participants there is observable behavior right from the beginning; although there is no statement about the level of this occurrence. Throughout the training, the level of occurrences increases, but from II to III, the level of II is basically maintained.

Item 6 (yes-sets established) is an exception within all items due to the overall level. Compared to the other items, ratings are given very seldom.

Subgroup Differences   There are not many significant differences between TU and D8. In total, there are seven significant differences; three at I, one at II, and three at III. For all them, D8 proves to be better than TU. At the first measurement, participants of D8 have an occurrence significantly more often in items that cover reassuring meanings and terms brought up by the client of the interviews. This may be founded in the stronger customer orientation of the D8

	I		II		III		sign.
	%	**sign.**	**%**	**sign.**	**%**	**sign.**	change
1) Procedure explained	54.8		70.0		80.8		
2) Counseling adapted to client	100		100		100		1)
3) Empathetic counseling	100		100		100		1)
4) Following formal procedure	71.9		83.3		84.6		
5) Sustained transparency by structuring	96.9		92.9		92.0		
6) Yes-sets established	6.3		13.8		3.8		
7) All elements identified from evaluator's view	93.8		100		100		
8) Reassuring if all relevant elements identified	68.8	*(D8)	90.0		96.2		* +
9) Reassuring if all relevant relations identified	56.3		80.0		96.2		* +
10) Reassuring meaning of elements	78.1	*(D8)	93.1		84.6		
11) Reassuring meaning of relations	64.5	*(D8)	76.7	*(D8)	84.6		
12) Summarizing client's descriptions	53.1		70.0		80.8		+
13) Identifying systems boundary	31.3		53.3		44.0		
14) Resource orientation	84.4		96.7		92.3		
15) Identifying dynamical patterns	34.4		23.3		50.0	*(D8)	
16) Integrating client into modeling	90.6		90.0		84.6	*(D8)	
17) Agreed on further steps	62.2		90.0		68.0		
18) New insights for client	78.1		80.8		78.1	*(D8)	
Total	68.1		78.0		78.9		* +

Table 8.8: Occurrences Rated by External Raters in DIDSYM
1) No calculation possible, since all values = 1 at all measurements.
* indicates significant change (Cochran's Q).
+ indicates significant change (pre and post test; I vs. III)

participants which they had at that point due to their systemic training.

The singular significant difference at II stems from the item "reassuring meaning of relations". So, at I and at II, participants of D8 have an occurrence for this item more often than participants of TU. This difference is not sustained at III, though.

At III, D8 receives more occurrences again in three items. All three items cover counseling behavior, that add a surplus to the "pure" procedure of Idiographic System Modeling. The active integration of the client into the modeling requires more flexibility and openness compared to a non-integration. Although, there is a slight decrease in the number of occurrences at III, D8 participants are able to manage this integration better than TU. It seems that D8 continues the general development of being able to describe dynamics stronger than TU. The same holds true for the last item "new insights for client"; in total there is basically no development, but at III D8 is better than TU.

There is no systematic pattern in the occurrences besides the fact that D8 receives higher ratings than TU.

Improvement   There are two items (8, 9) for which there is a significant positive development. Both items cover the reassurance of the counselor about the identification of all relevant elements or relations. The improvement is calculated with Cochran's Q.

Not regarding significant developments but the development of the percentage points alone, the 18 items can be grouped into three categories: stability, decrease, and increase. In the group of stability (items 2, 3, 7, 18) and decrease (5, 6, 17) there are mainly items that are not directly connected to the procedure of Idiographic System Modeling but of more general nature. The 11 items that show an increase are mainly items that are strongly connected to the method itself (identifying and understanding system elements, putting them into relation, following procedure). Although, it has to be mentioned that for some items there is a tremendous increase from I to II, but a decrease from II to III, like for "agreed on further steps", "resource orientation", "system boundary".

Overall, for most items there is an increase in the frequency of ratings considering the development from I to III. The development across all three measurements does not suggest a linear trend for the gain of competence, though. This is shown by the higher rating frequency at II. The stable items remain on their rather high level, and the decreasing items decrease only by a few percentage points. The decrease in some items from II to III suggests that some aspects became forgotten at the last evaluation round that were observable in the second one.

The development of the mean across all items at each measurement shows a significant improvement.

Pre - Post Comparison   Additionally, to the calculation of Cochran's Q, a pre-post comparison of I and III is calculated to identify significant changes between both measurements. This

basically leads to the same results as the results presented above on item level as well as on the comparison between the averages of I and III across all items (see section 8.2.3).

Comparison to D7   With respect to the occurrences, the results of D7 conform with the other subjects at all items with one exception: participants of D7 seem to summarize the client's description more often than the others. As this technique is part of their training, this finding can be well explained. Since this is the only obvious difference, the question arises why there is no more distinct delineation from the others.

Level of Occurrences   For the following consideration, the items are viewed for which any extent of the respective behavior is observed. The development of the level of occurrences from the first to the third measurement is presented in table 8.9. Theoretically, the values can range between the lowest score 1 and the highest score 4. The results in this table represent the levels of the occurred items, since only when the behavior to be observed was coded as existent an item received a value. With respect to the structure and the used abbreviations table 8.9 resembles the structure of table 8.8.

The items have quite low to moderate scores. The highest scores can be found in item 2 and 3 whereas both remain on this high level at all measurements. Excluding these two item the ratings range from 1.0 to 2.7 at I, 1.3 to 2.7 at II, and 1.0 to 2.9 at III. This shows that the overall range does not change very much. The answer scale theoretically ranges from 1 to 4, but the upper part of the scale is barely used.

Considering the general level of the ratings for each measurement it shows that this level increases with each evaluation. At I, this level is at 2.0; 2.2 at II, and 2.5 at III. Therefore, the external raters attest the participants an increasing competence from measurement to measurement.

Subgroup Differences   A total of 4 significant differences is found in the ratings. D8 receives the better ratings in all of the items. Thus, it resembles the significant subgroup differences in table 8.8 in which all significant subgroup differences are also determined by a better counseling behavior of D8 participants.

There is no connection with respect to content between the measurements. Only at II, item 9 (reassuring if all relevant relations identified) and 12 (reassuring meaning of relations) are connected with each other.

The subgroup differences found in these ratings are not thought to be very important. Due to the small number of significant differences, it can be assumed that there are no systematic differences in the ratings of this random sample.

	I		II		III		sign.
	mean	**sign.**	**mean**	**sign.**	**mean**	**sign.**	change
1) Procedure explained	1.0		1.3		1.4		
2) Counseling adapted to client	3.2		3.2		3.1		
3) Empathetic counseling	3.1		3.2		3.3		
4) Following formal procedure	1.4		3.3		2.3		+
5) Sustained transparency by structuring	1.8		2.0		2.0		
6) Yes-sets established	1.0		2.0		1)		
7) All elements identified from evaluator's view	2.7	* (D8)	1.2		2.7		
8) Reassuring if all relevant elements identified	2.2		2.3		2.7		+
9) Reassuring if all relevant relations identified	2.2		2.2	* (D8)	2.7		* ++
10) Resource orientation	2.2		2.3		2.7		
11) Reassuring meaning of elements	2.0		2.3		2.6		+
12) Reassuring meaning of relations	1.9		2.5	* (D8)	2.3		
13) Summarizing client's descriptions	1.7		2.1		2.3		
14) Identifying systems boundary	1.6		1.8		2.3		+
15) Identifying dynamical patterns	1.7		2.1		2.4		
16) Integrating client into modeling	2.6		2.7		2.9		
17) Agreed on further steps	1.6		2.2		2.1		
18) New insights for client	1.7		2.5		2.7	* (D8)	+
Total	2.0		2.3		2.5		** ++

Table 8.9: Level of Occurrences Rated by External Raters in DIDSYM

1) No calculation possible, only one subject has valid ratings.

* indicates significant change (repeated measures).

+ indicates significant change (pre and post test; I vs. III)

Improvement   To determine if there is a significant development in the extent of the ratings, a repeated measures variance analysis was calculated. The results show one significant development for item 9 (reassuring if all relevant relations identified).

The 18 items can be grouped into two clusters. There are four items that basically do not show any change across the measurements (item 2, 3, 5, 7), although item 7 shows a strong decrease at II before reaching its initial rating again at I. The remaining 14 items show a constant increase in the ratings over the measurements. Out of these items, there are only 2 that show a slightly higher rating at II than at III.

Despite this basically upward trend in the results, there is only the one significant development found. The fact that a repeated measures variance analysis can only be calculated when the same individual has a rating at all three measurements may play an important factor and overshadow significant developments in the complete sample. A pre-post comparison shows an improvement of more items.

The improvement across all items is highly significant. The average increases from measurement to measurement and reflects the fact that the raters observe higher extents of relevant counseling behavior.

Pre - Post Comparison   In comparison to the results of the repeated measures variance analysis, pre-post tests from I to III are calculated with paired sample t-test. This analysis results in six significant differences for the items 4, 8, 9, 11, 14, and 18. With respect to significant developments this gives a different picture to the improvement over all measurements (repeated measures). These significant developments do not follow a systematic pattern. But they do show an improvement between the first and the third measurement in some aspects of the Idiographic System Modeling. As well, the comparison between I and III across all items is highly significant.

Comparison to D7   With respect to the occurrences, no major deviations between the subgroups at I can be found. But a trend is suggested when looking at the level ratings. For 11 of the 18 items, the values of D7 lie above the mean of the total group fro the respective item. This suggests that more experienced counselors do not show more of the relevant behavior, but if they do, they perform on higher level, at least for the majority of behavioral categories.

Summary

There is a good inter-rater reliability between the two external raters which is the prerequisite for interpretation.

The overall number of occurrences depends on the item. There are items which can be observed all the time, other items are very seldom observed. There are significant differences between the subgroups; D8 shows more occurrences than TU at the respective items.

There is no major increase in the number of occurrences across the measurements but there is an improvement for most of the items, but only a very few items show a significant improvement across the evaluation rounds.

There is an improvement for most of the items with respect to the rating, there is even a significant improvement for one third of the items. When there are subgroup differences, D8 shows higher ratings. For the average of all items, there is a significant improvement for the occurrences and for the level of the ratings.

D7 shows no major deviations from TU or D8. The participants do not show more of the relevant counseling behavior that is specific for the Idiographic System Modeling but on a higher level.

8.2.4 Quality of System Models

Each interview produces a graphical system model. The quality of these models is rated with a criteria list of 23 items. It is divided into two parts: 13 items cover the general quality of the graphical system model and 10 items cover cybernetic criteria. For all items the occurrence and the level of occurrence is calculated. For the items of the general quality of a model, the category of observable occurrences is again divided into three answer options (insufficient, largely, completely) that specify the degree of completion.

General Criteria

The results of the general criteria are presented in two parts. The first part discusses the occurrences for each item and measurement. The second part reflects the development of the level of occurrences from the first to the third measurement. For each part, the differences between the subgroups and the improvement throughout the training is described.

Occurrences Table 8.10 lists the percentages of the occurrences. The percentage is shown for each measurement. Significant differences between the subgroups are shown for the respective item and measurement. The last column lists significant changes in the development over all three measurements. An empty cell in this column indicates that there is no significant change. The results of the D7 models are not considered in table 8.10. They are discussed in section 8.2.4 on page 152.

The range between the lowest and the highest percentage points decreases from I to III from 72.7 to 53.8 percentage points with the constraint that item 4 (description beyond + and -) has to be taken out of this consideration (for explanation see page 151). Item 4 excluded, the mean of the measurements increases from 60.9 to 64.4 to 81.4 percentage points. This reflects the significant contribution of the items visualization, understandability of model, submodels, levels of reference and description of relations on a more global level.

	I		II		III		sign.
	%	**sign.**	**%**	**sign.**	**%**	**sign.**	change
1) Intelligible visualization	78.8	* (TU)	89.7		96.2		*
2) Positive wording	84.8		89.3		96.2		
3) Simple, comprehensible wording	78.8		82.8		96.2		
4) Description of relations beyond + and -	36.4		34.5		7.7		*
5) Understandability of model	84.8		58.6	* (TU)	80.0		*
6) Closed feedback loops	27.3	* (TU)	24.1		57.7	* (D8)	*
7) Several levels of reference	54.5		86.2		92.3		* +
8) Solution and resource orientated model	63.6		44.8		73.1		+
9) Precise actions derivable from model	45.5		37.9	* (TU)	61.5	* (D8)	
10) Avoiding pathological categories	93.9		96.6		100.0		
11) Recursively netted sub-models	21.2		13.8		46.2	* (D8)	*
12) Description of relations with + or -	27.3	* (TU)	62.1		88.5	* (D8)	** +
13) Dependency between elements marked	69.7		86.2		88.5	* (D8)	
Total	59.0		62.0		75.7		* +

Table 8.10: Occurrences in Quality of System Models
* indicates significant change (Cochran's Q).
+ indicates significant change (pre and post test; I vs. III)

For I, there is already a number of items that have a high percentage of rated items. Taking the mean of the occurrences at I as an indicator which items have many vs. few occurrences, then 7 items have a percentage over 59 % (mean of the percentages at I, item 4 included).

Subgroup Differences   The Pearson's Chi-Square test is used for calculating significant differences between TU and D8. It shows, that for I (3 significant differences) and II (2 significant differences), the differences are due to higher ratings for TU participants. At III, however, each significant difference (5) is determined by the higher assessments of D8 participants instead.

Improvement   Overall significant changes are calculated with Cochran's Q, showing significant changes in 7 of 13 items. The least change is in item 10 (avoiding pathological categories). Pathological categories are basically not used in the system models at hand.

There are four items that are crucial constituents for a system model: closed feedback loops (item 6), recursively netted submodels (item 11), descriptions of relations with + or - (item 12), and dependency between elements marked (item 13). The development of the items 6, 11, and 12 is significant. Only, item 13 is not significant, although there is an increase in percentage points.

Item 5 (understandability of model) shows a considerable drop in the ratings from I to II, and an increase again up to III. But the assessment does not reach the initial value. This finding can be explained that the documentation of DIDSYM (interview meta data, description of initial situation, and description of further actions) has been less thoroughly conducted at III than in the first interview round.

Some items show a decrease in the assessment from I to II, but an increase beyond the first assessment at III: item 6 (closed feedback loops), 8 (solution and resource orientation), 9 (precise actions derivable), and 11 (recursively netted submodels). It can be assumed, that these characteristics were intuitively integrated at I. Getting out of focus after the first training round, they were concentrated more on after the second training round. It can be assumed that the participants focused more on following the schema of the Idiographic System Modeling and the identification of elements.

There is only one item that shows decreasing ratings (item 4 "description or relations beyond + and -"). This shows a learning success since the training teaches the description of the relations with a "+" or "-". Free annotations of the relations often can be found at I are substituted by specifying the relation with "+" or "-". The first system model of DOKL54 serves as a good example of the additional description of the relations between elements (see figure 8.8 on page 156).

In general, it can be stated though, that the number of observed behavior increases with each measurement. The analysis reveals a significant improvement considering the average of all items at one measurement.

Pre - Post Comparison   The pre-post comparison between I and III, calculated with the Mc-Nemar test, shows three significant differences. These are four less than the improvement over all three measurements shows. As this test seems to be more conservative, for interpretation, the results of section 8.2.4 shall be considered. Also, with a pre-post comparison, the positive improvement is significant.

Comparison to D7   The two graphical system models of D7 provide reference data for the first measurement. Those findings are reported that seem peculiar for a participant in a systemic training at the end of a two year training.

Basically, the occurrences in the quality of the models are comparable with the ones of the other subjects with the following peculiarities. Both individuals use further descriptions of the graphs, unlike the majority of the participants. This is understandable, since due to the assumed interviewing skills, more information can be gathered and displayed. Surprisingly, both individuals neither integrate solution or resource oriented aspects into the model nor describe precise actions. Resource and solution orientation as well as planning further actions play an important role in the institution's training. On this account, the complete absence of these aspects is surprising. Submodels can not be identified at any of the D7 models. Recursive systemic thinking obviously is not present.

Level of Occurrences   Table 8.11 presents the level of occurrences for the items describing the quality of the graphical system model. Due to the ordinal scale of the rating scale (3 answer options) , the median for each measurement is depicted. Additionally, subgroup significant differences for each measurement and the significance of the overall development are presented.

Subgroup Differences   The test for significant differences between TU and D8 was calculated with Mann-Whitney test. Item 2 (positive wording) and item 3 (simple, comprehensive wording) show significant differences at I and III. With these ratings a pattern in the findings repeats that already can be found in table 8.10. At I, significant differences show that TU receives higher ratings than D8. There are no significant differences at II, but at III D8 receives significant higher assessments at some items.

Improvement   The overall change (last column in table 8.11) is calculated with the Friedman-test for repeated measures and ordinal scales. Amazingly, there is only one item significant in its development (item 2; positive wording). There is significantly more positive wording at III than at I.

There are five items whose ratings stay on a constant low rating, and thus, do not show a significant change. This applies to the items 10 (recursively netted submodels), 7 (several levels of reference), 8 (solution and resource orientation), and 9 (precise actions derivable). With respect

	I		II		III		sign. change
	Med.	**sign.**	**Med.**	**sign.**	**Med.**	**sign.**	
1) Intelligible visualization	1.0		1.5		2.0		
2) Positive wording	1.0	* (TU)	2.0		2.0	* (D8)	* +
3) Simple, comprehensible wording	2.0	* (TU)	2.0		2.0	* (D8)	+
4) Description of relations beyond + and -	1.5		1.0		1.0		1)
5) Understandability of model	1.5	* (TU)	2.0		2.0		
6) Closed feedback loops	1.0		2.0		2.0		1)
7) Several levels of reference	1.0		1.0		1.0	* (D8)	
8) Solution and resource orientated model	1.0		1.0		1.0		
9) Precise actions derivable from model	1.0		1.0		1.0		1)
10) Avoiding pathological categories	3.0		3.0		3.0		
11) Recursively netted sub-models	1.0		1.0		1.0		1)
12) Description of relations with + or -	2.0		2.0		3.0	* (D8)	
13) Dependency between elements marked	3.0		3.0		3.0		
Median Total	1.0		2.0		2.0		+

Table 8.11: Level of Occurrences in Quality of System Models
1) No calculation possible, not enough valid cases.

to competence development, an increase of the ratings over time could have been expected. Item 3 (description beyond + and -) is another example of an item with a constant low rating. As the training did not propagate this way of description, the slight decrease in the ratings is in favor of the competence development.

Item 13 (dependency between elements marked) and item 10 (avoiding pathological categories) have constantly very high ratings. The median of 3.0 for each of the measurements as the highest possible rating does not allow room for further improvement. As such, there is no competence development for these items but very high ratings right from the beginning.

Item 3 (simple, comprehensive wording) remains on a medium level with a constant median of 2.0. Also, there is no development in any direction. As for both groups described above, there is no competence development.

Item 1 (intelligible visualization), 2 (positive wording), 5 (understandability of model), 6 (closed feedback loops), and 12 (description of relations with + or -) do show an improvement according to the median but this change is not significant. Especially, item 9 and item 12 are important for the quality of an idiographic system model, since both characteristics are necessary to describe system dynamics and intra-system dependencies.

Pre - Post Comparison A pre-post test comparison (Wilcoxon-Test) basically reproduces the same results as described in the section above. Item 2 shows a significant development, but also item 3 (simple, comprehensible wording). So, there is no substantial difference in viewing the development across three measurements or just the pre-post comparison. The comparison between the medians at I and III shows a significant improvement.

Comparison to D7 With respect to the level of occurrences for the two participants of D7, no apparent differences can be reported. This fact arises from the low number of reference data.

As a summary for the comparison of D7 with the members of TU and D8 at the first measurement, it can be suggested that there is reason to believe that more experienced counselors show a better counseling behavior than unexperienced counselor when a method is to be applied that is unknown to everybody. Of course, this is not founded on a broad empirical data base.

Synopsis of Ratings

It can be concluded, that there is a general trend for an increase of relevant characteristics in system models throughout the training, although, this increase is not significant at all items. Additional to the fact that relevant characteristics can be observed more often, the intensity of the observed behavior increases as well but this finding is even less often significant.

There are five items for which there is an increase in the percentage of ratings, although this increase is not significant, and for which the level of the ratings remain stable: item 3 (simple, comprehensible wording), item 8 (solution and resource orientation), item 9 (precise

actions derivable), item 10 (avoiding pathological categories), and item 13 (dependency marked between items).

A significant increase of the number of rated items and stable ratings is there for item 6 (closed feedback loops) and item 7 (several levels of reference).

A significant increase in the number of rated items, and an increase - though not significant - increase in the ratings happens with the items 1 (intelligible visualization), 11 (recursively netted submodels), and 12 (description or relations with + and -).

Item 2 (positive wording) shows an insignificant increase in the percentage of ratings and a significant increase in the ratings.

One exception is item 4 (description of relations beyond + and -). There is a significant decrease in the frequency of ratings, while the ratings also drop down from the first to the third measurement. This decrease, though, shows a gain in competence with respect to the training, since the training focused on describing the relations between elements with only + or -.

One further exception is item 5 (understandability of model), there is a slight, significant decrease in the percentage of ratings, but the ratings themselves go up a little bit.

These findings are summarized in table 8.12.

Item Description	Item	Frequency	sign.	Level of Rating	sign.
Intelligible visualization	1	increase	*	increase	
Recursively netted submodels	11	increase	*	increase	
Description of relations with + or -	12	increase	*	increase	
Positive wording	2	increase		increase	*
Closed feedback loops	6	increase	*	stable	
Several levels of reference	7	increase	*	stable	
Simple, comprehensible wording	3	increase		stable	
Solution and resource orientated model	8	increase		stable	
Precise actions derivable from model	9	increase		stable	
Avoiding pathological categories	10	increase		stable	
Dependency between elements marked	13	increase		stable	
Description of relations beyond + and -	4	decrease	*	decrease	
Understandability of model	5	decrease	*	increase	

Table 8.12: Quality of System Models - Synopsis

System Models - Examples   This section presents three exemplary graphical system models in order to show the usage of system models as a result of the Idiographic System Model. First, a system model is presented that serves as a mere information collection. Second, the improvement of the graphical system models of HEWE34 (participant code) are presented.

Figure 8.8 shows the first system model of DOKL54. It shows clearly how the instruction "to interview in order to create a system model" can lead to an extensive information collection. As helpful as this collection may be, the information remains structured around involved persons, intra-individual processes can not be identified and mutual dependencies are not depicted. This first system model of DOKL54 is a very good example of the descriptions of relations beyond + and -, a characteristic that vanishes from I to III. Compared to the (relative) clarity of the third system model of HEWE34 (see figure 8.10, it has to be remarked that any additional description of the relations should be used selectively in order not to overburden the model in addition to the depicted process dynamics.
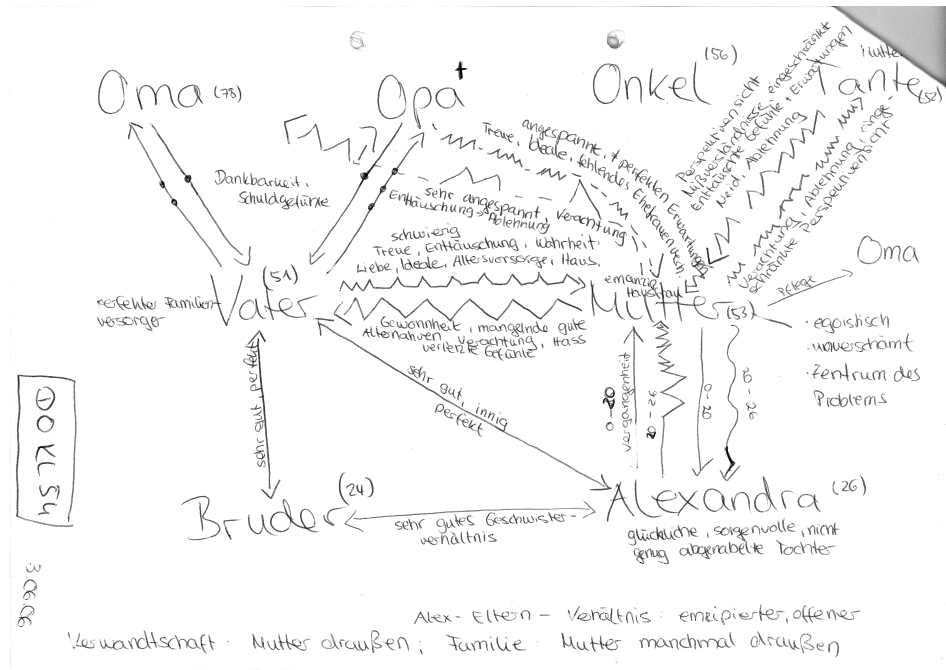
Figure 8.8: System Model No. 1 of DOKL54

The following two system models depict the progress found in most system models. The progress from an informal sketch with a few key words to a more formal and complex interaction diagram following the main principles of a well-defined system model becomes quite clear. The system models are created by HEWE34 of D8. Figure 8.9 shows the system model at the first

measurement. It reflects the living situation of the client "Sabine" with her husband and son, the in-laws and own parents; especially the client's wish for more privacy since Sabine's family is living with the in-laws in the same house.
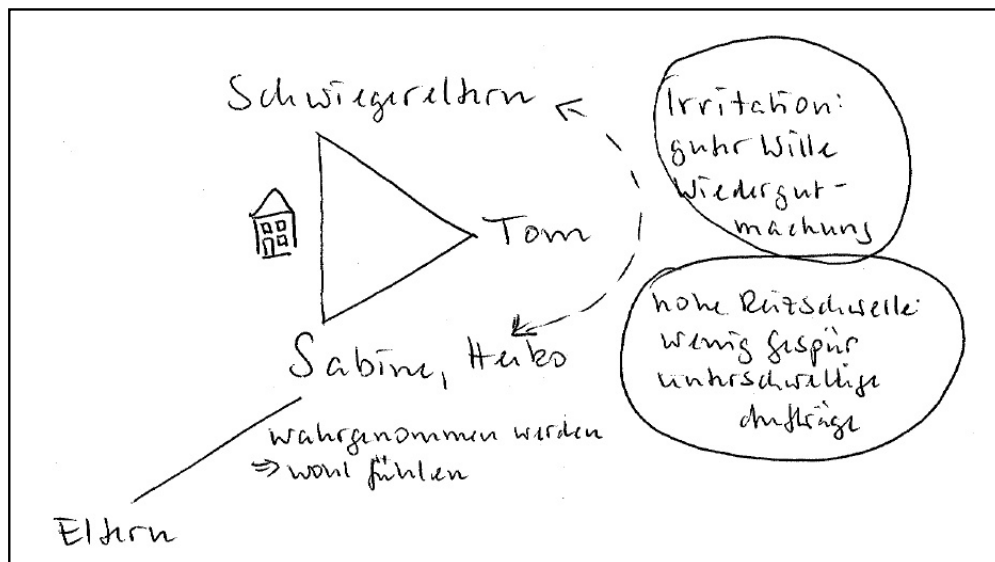
Figure 8.9: System Model No. 1 of HEWE34

The system model basically consists of a collection of names who represent the client's family and two key words that represent the two major topics coming up in the topic ("Irritation" and "hohe Reizschwelle"). The triangle and the little sketch of a house represent Sabine's living situation. One connector between the client and her in-laws ("Schwiegereltern") represents the difficult relation. Another connector between client and her own parents ("Eltern") shows the satisfying relation between both parties. This information is retrieved from the interview. Without this, the system model alone does not provide enough information to understand the client's situation. There are very few elements which are only scarcely connected with each other, without given the direction of influence. Feedback loops, sub models, or several levels are not indicated. Solutions, resources or further steps can not be identified. This system model can not be called a system model. It is lacking its most important characteristics.

The system model at measurement III reflects the situation of a client who expects to be asked to be godmother of her sister's newborn child. At the same time, she assumes that she will have to share the godparenthood with the sister's brother-in-law whom she does not like. The interview centers around the question how this shared godparenthood can be accomplished. This model is depicted in figure 8.10.

This system model has a considerable number of elements and a high degree of interrelations. The influence direction is given and all graphs are labeled with a + or -. This results in system
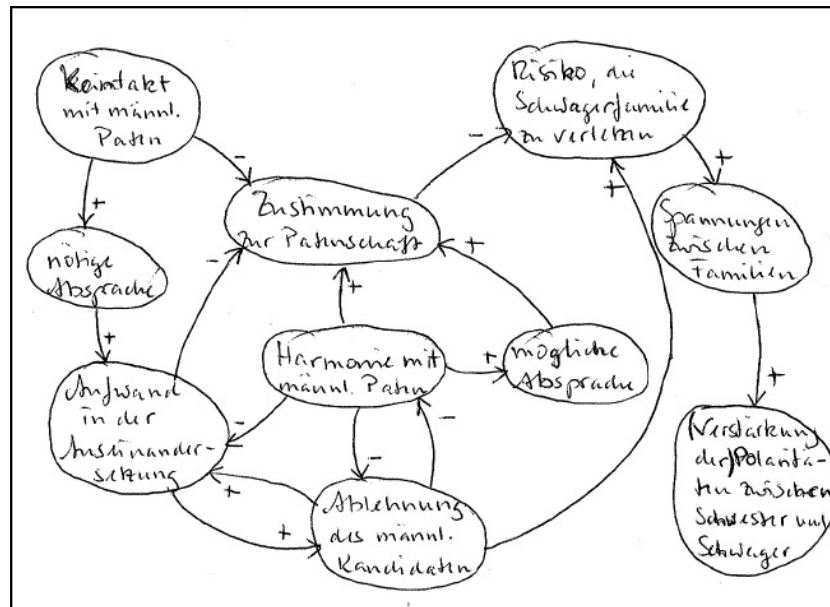
Figure 8.10: System Model No. 3 of HEWE34

dynamics. There are some solutions indicated ("Kontakt", "nötige Absprache"), which again hint at future steps, although these are not explicitly listed. Resources are not named. There are few (small) closed feedback loops; sub models can not be identified. This model is understandable with respect to the reason for the interview, and can be understood as a real system model with respect to the Idiographic System Modeling with some deductions. Although this model does not suffice all criteria in every aspect, it shows a considerable improvement compared to model I.

Cybernetic Criteria

The criteria list also contains 10 cybernetic criteria that consider aspects like buffers, thresholds, internal and external dependencies, contacts, developments, adjustable components, and mixed feedback. These criteria were part of the training and their use in system models was discussed at the end of the second training round. Despite their coverage in the training which included hand-out material, none of the ten criteria is found in any of the models at any measurement. The possibility of characterizing a system model with these criteria was oblivious to the counselors. Thus, an improvement of the quality of the system models with respect to cybernetic criteria does not happen, since there are no occurrences of these criteria at all. The learning possibility for this area was not considered by the training participants.

Summary

The quality of the graphical system models is assessed by a set of criteria that are analyzed first by the occurrences and then by the level of the ratings of the occurred items. The number of occurrences increases considerably across the measurements for all items. For half of the items, this development is even significant. At III, the percentage of occurrences is very high. At I and II, TU presents models of higher quality, at III, however, D8's models are better than the ones of TU.

The level of the ratings are rather low for most of the items, and there is little improvement in the ratings across the measurements. The only significant improvement is with two secondary items. In general, the level of the ratings tends to remain stable, this may be due to the 3-step ordinal scale, that does not allow much variance.

For the occurrences, as well as for the level of the ratings there is a significant improvement (average of all items across the measurements).

As for the occurrence, the same holds true for the level of ratings: At I, TU receives better ratings, whereas at III, D8 has better ratings than TU.

D7 does not show any differences with respect to the number of occurred items, but shows slightly better levels of ratings.

Looking at the occurrences and the level of rating together, it shows that there is no item that shows a decrease in the number of occurrences and level of rating at the same time. Thus, in general, there is a positive trend, although it does not show very clearly in significant improvements.

Cybernetic criteria are not mentioned at all in any of the graphical system models.

8.2.5 Conclusion

If the interview duration is taken as a criterion for competence development in conducting the Idiographic System Modeling, an improvement can be stated for all participants. The improvement is significant for the complete group as well as for each of the subgroups. The significant higher interview durations of D8 show a higher competence for this subgroup over TU, which is supported by the interview durations of D7. Thus, more experienced counselors are able to adhere to the Idiographic System Modeling longer than less experienced counselors.

The ratings by the interview participants are quite high right from the first interview on, but there is a significant improvement from I to III across all items and an improvement in the ratings of the clients and observers. There are no differences in the competence assessment between the subgroups and more experienced and less experienced participants do not rate their competences different from each other. The differences between the three perspectives are minimal, and are not of any practical relevance. Also, the gain of the overall rating for the total group is not very high, yet significant. The gain in values is considerable for some items, though. A

competence gain is found in the ratings of the participants. This leaves open the relevance of these differences, though.

External raters state an improvement by observing relevant counseling behavior more often. The increase of occurrences is not significant for all items but there is also an improvement in the ratings. The few subgroup differences show that D8 participants are higher rated than TU participants. The more experienced participants of D7 do not receive any different ratings. The external raters see an overall improvement in the counseling behavior considering the development of the occurred items as well as their rating level. Therefore, a competence gain is stated.

For the graphical system models, there is a considerable increase in the number of model characteristics, whereas there is almost no improvement in the ratings of the models. Significant subgroup differences are identified, but in contrast to the ratings described above, TU dominates D8 at I and II, whereas D8 shows the better ratings at III. In general, there is a positive trend, although it does not show very clearly in significant improvements. Cybernetic criteria are not mentioned at all in any of the graphical system models. As a whole, the models improve in their quality across the measurements. This shows in the number of model characteristics and in the ratings of these characteristics.

8.3 Generic Principles

The following section presents the results of the interviews conducted with DUGEP. First, the interview duration is presented, including a comparison with the interview duration of DIDSYM. Second, the ratings by participants are presented, comprising the concordance between the raters, followed by the assessment of the interview participants and the results of the factor analysis. Third, the ratings by the external raters is presented, describing the characteristics of the interview processes and the use of the Generic Principles.

8.3.1 Interview Duration

As for DIDSYM, the interview duration can be considered as an indicator for the ability of a counselor to maintain the counseling interview (compare section 8.2.1). For the total group, the interview duration remains at the same level for the first two measurements and increases at the last measurement. As the repeated measure variance analysis shows, the increase in duration is significant at 0.05-level (see table 8.13).

The stable interview duration at I and II can be attributed to a decrease in duration for D8, similar to DIDSYM (compare table 8.3). Despite the duration increase at III, the development is not significant. For TU there is a constant, significant increase in duration.

The decrease of the interview duration of D8 can not be explained by exceptional interview durations of one peer group, as it can be explained with the first measurement of DIDSYM (see

	Duration (in min)			*sign.*
	I	**II**	**III**	
TU	14.0	15.8	21.6	*
D8	26.6	23.8	28.8	*n.s.*
Total	19.9	19.8	25.2	*
sign.	**	**	*	

Table 8.13: Interview Duration, DUGEP

page 135). With DUGEP, it seems that some individuals independent of their membership to a certain peer group held longer interviews at I than they did for the second measurement.

Considering the duration between the subgroups, D8's interviews are significantly longer than the TU's at all three measurements. TU's gradient is steeper though than D8's.

With 23 minutes, the duration of D7's interview duration lies between TU and D8, although closer to the duration of D8. These data have to be interpreted with care, since there are only two reference interviews of D7.

Interview Duration DIDSYM and DUGEP As a comparative summary, figure 8.11 shows the interview durations of DIDSYM and DUGEP at all three measurements; each for the total group. As it shows, the durations of DIDSYM interviews are considerably longer than for DUGEP interviews. The difference in duration is 6.4 minutes at I, 4.7 minutes at II, and 7.2 minutes at III for the unadjusted duration of DIDSYM I (for the comparison of adjusted and unadjusted durations, see section 8.3 on page 135).
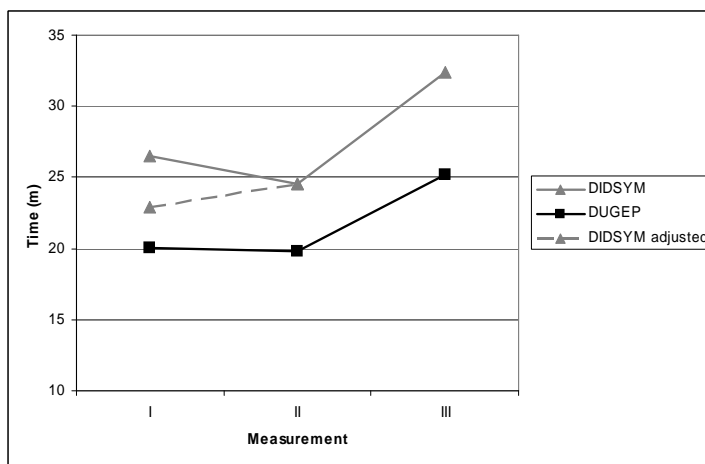
Figure 8.11: Interview Durations of DIDSYM and DUGEP

The difference in duration between DIDSYM and DUGEP is significant at 0.01-level at all measurements. The method of Idiographic System Modeling requires more activities of information gathering and putting it into relation than it is necessary for DUGEP. Even in a training context, as such in which this thesis' trainings took place, these activities require more time than a solution-oriented interview. This effect already shows at the first measurement, at which the training participants do not have any detailed information about what to do.

8.3.2 Ratings by Participants

DUGEP contains rating scales with 23 items that describe counseling behavior from three different perspectives (counselor, client, observer). This section presents the results gained by discussing the concordance between the perspectives at first. Next, the results themselves are presented and finally, the factorial structure of the DUGEP items are presented.

Concordance

As for DIDSYM, the concordance is calculated to show the mutual consent between counselor, client, and observer. The same basic thoughts take effect here: the interview participants rate relevant behavior and assign numerical values. Also, for DUGEP, there is no reflection or discussion supported about the items in the training. An increasing concordance reflects a higher mutual consent, and thus, a common understanding how to rate the observed behavior. This process may happen implicitly or explicitly.

For DUGEP, the concordance ranges from $W = 0.55$ to 0.60 to 0.64. The curve over all three measurements follows a positive, linear trend (see figure 8.12).
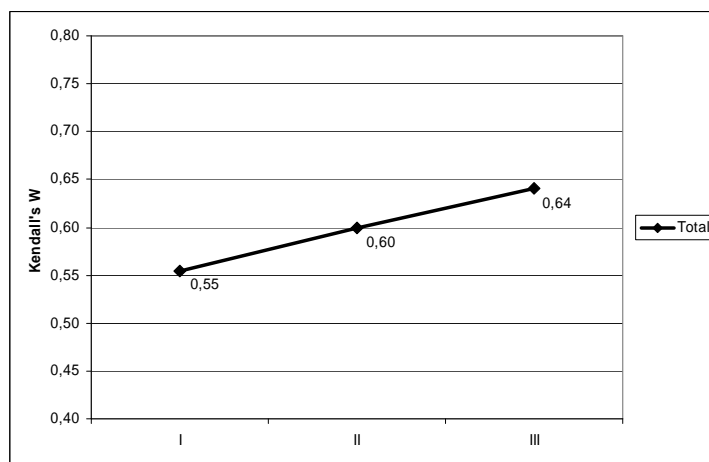
Figure 8.12: Concordance of Ratings in DUGEP

For DUGEP this means that counselor, client, and observer conform more in their ratings with each measurement. The initial value of W = 0.55 is comparable to the initial value of DIDSYM (W = 0.53). In contrast to DIDSYM, the concordance curve of DUGEP does not rise as steep, but keeps climbing. There is no decrease in mutual consent from II to III, as the concordances in DIDSYM.

Despite this increase, the maximum concordance of W = 0.64 at III still has to be considered as moderate. The maximum difference in concordance for DUGEP lies at W = 0.09 for II to III; for DIDSYM it lies at W = 0.14 from I to II.

Self-Assessment and Assessment by Others

In this section, the development of the assessment from each perspective is presented. This gives information about the stability of the ratings from one measurement to the other. This section presents the data from two different viewpoints. First, they are structured by subgroup, and second by perspective.

Assessment and Subgroups   Table 8.14 presents the means for the 23 DUGEP items for each measurement. Significant differences between subgroups are indicated in the column behind the respective mean. The answer scale ranges from 1 (low agreement) to 5 (high agreement). Significant developments from I to III are indicated in the very last column. The intra-individual development is tested for significance with a repeated measures analysis. The relevant test of within-subjects effects considered in the Greenhouse-Geisser test, since it is conservative and for small sample size.

At I, the values range from 3.5 - 4.3; 3.4 - 4.4 at II, and 3.5 - 4.4 at III. The range remains the same for each measurement (0.8). All values are located well on the positive section on the answer scale. The high level of ratings shows right from the first measurement on and is maintained with no exception.

As table 8.14 shows, there are no significant differences between TU and D8 at I. Therefore, comparable initial positions regarding the ratings can be concluded. At II and III, there are three significant items each. In every case, the D8 participants rate the interview behavior higher than TU participants. Especially for item 9 (client trusts in own abilities) D8 gives higher ratings at II and III. Other than that there is no systematic pattern in the ratings.

The results of D7 can be compared with the other subgroups. It shows that there is one item for which D7 receives significantly higher ratings than TU and D8 (item 15; counseling motivated new experiences). This stands out since this is the only item for which there is a significant difference for D7 from the others for all three evaluation instruments WIGSY, DIDSYM, and DUGEP. This solitary incident must not be overrated, though. First, the number of subjects of D7 does not allow this statement, plus it is the only item out of 23 items. It is more important that there are no significant differences in the ratings for 22 out of the 23 items. As it shows,

	I	II		III		sign.
	mean	**mean**	**sign.**	**mean**	**sign.**	change
Client confides in counselor	4.2	4.4	* (D8)	4.4		
Counselor asks fitting questions	3.7	3.9		3.9		
Counselor identifies relevant system	3.9	3.9		3.8		
Client's ideas and contributions are appreciated	4.3	4.3		4.2		
Client finds adequate solution	4.0	4.1	* (D8)	3.8		
Client understands the need to change	4.1	4.1		4.0		
Client feels in good hands	4.1	4.3		4.3		
Client is encouraged to break new ground	4.0	3.9		4.0		
Client trusts in own abilities	3.7	3.5	* (D8)	3.6	* (D8)	
Counseling helps deciding	4.0	3.9		3.7		
Client realizes resources	3.9	3.5		3.5		+
Counseling supports behaving differently	3.9	3.6		3.5		
Client considers counseling important	3.5	3.6		3.6		
Counselor keeps referring to identified system	3.7	3.8		3.7		
Counseling motivates new experiences	3.7	3.5		3.8		* +
Counselor encourages client	3.9	4.1		3.5		
Client envisions future life	3.5	3.4		3.8		
Counseling is worth strain and effort	3.9	4.0		3.9		
Client accepted the counseling offered	3.9	4.1		4.0		
Counseling generates motivating goals	3.9	3.8		3.8		
Counseling pace attuned to client	4.0	4.1		4.2		
Counselor keeps goal vivid	3.7	3.7		3.8	* (D8)	
Client sees situation differently	3.7	3.4		3.5	* (D8)	
Average Level	3.9	3.9		3.8		

Table 8.14: Self-Assessment and Assessment by Others structured by Subgroups in DUGEP
* indicate significant changes (repeated measures).
+ indicate significant changes (pre and post test; I vs. III)
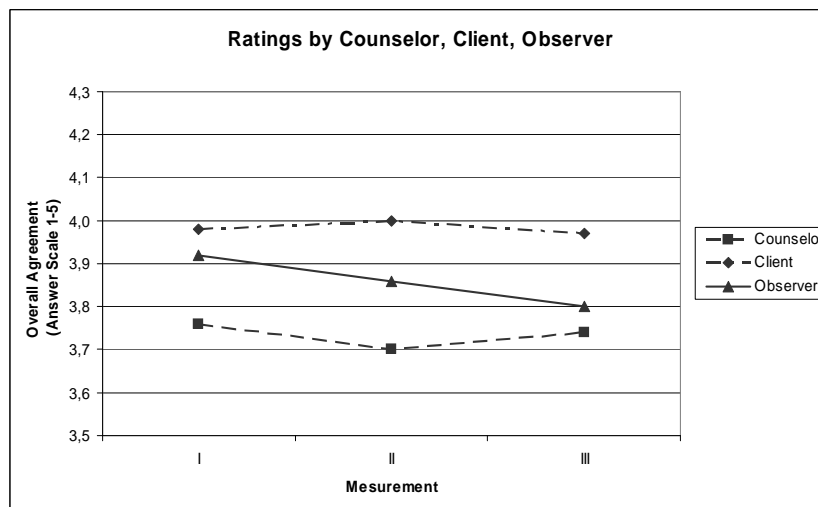
Figure 8.13: Assessment by Perspective in DUGEP

there are no meaningful differences in the rating behavior in the different groups who have very different backgrounds and experience levels.

For DUGEP, the differences between TU and D8 are not very pronounced (exception item 9). The majority of the items receives similar ratings.

Improvement   With respect to improvements throughout the training, only item 15 (counseling motivated new experiences) shows a significant improvement. Considering the prepost test comparison between I and III, item 11 (Client realizes resources) shows a significant improvement as well. In total, there is basically no improvement considering the ratings from either perspective.

Assessment by Perspective   This section describes the ratings of the DUGEP items by the three perspectives counselors, clients, and observers. Figure 8.13 depicts the average of all items for each perspective and measurement.

As the means show, the general level of all items is rather high. The minimum average for the items ranges between 3.3 (counselor) and 3.6 (observer) at I. The maximum average ranges between 4.1 (counselor) and 4.5 (client), as well at I. The minima and the maxima as well increase from I to III, and so does the range for each perspective. The average range across the perspective increase from I to II and remains at that level.

The means in figure 8.13 characterize the overall level for each perspective. For a more detailed view on the position of the items, table 8.15 describes the items that have a constant low or high position in the group of all items. For this purpose, the quartiles for the distribution of each perspective and measurements is calculated. Items, that are in the 25th or 75th percentile

	Low Rated Items (P 25)	**High Rated Items (P 75)**
Counselor	17 (Client envisions future life)	1 (Client confides in counselor)
		4 (Client's ideas and contributions are appreciated)
Client	15 (Counseling motivates new experiences)	1 (Client confides in counselor)
		4 (Client's ideas and contributions are appreciated)
Observer	11 (Client realizes resources)	
	17 (Client envisions future life)	

Table 8.15: Relative Position of Items in DUGEP

per perspective and measurement listed in table 8.6. They make a statement about the general position of these items.

Compared to the items of DIDSYM, there is less systematics in the data structure. It shows that item 1 and 4 receive high ratings by counselors and clients, but there is no item constantly high with observers. Counselors and observers have the same rating behavior with a consistent low rating for item 17. Summarized, it can be stated that there are very few position effects. Especially, when contrasted with the relative position of the items of DIDSYM, see table 8.6 on page 140, for which there are many position effects.

Assessment and Subgroups   Considering the different perspectives, there are significant differences at each measurement. At I, there are differences for the items 2 and 20. At II, items 1, 4, 18, 20, and 21 and at III, the items 2, 7, and 21 show significant differences. The distribution of the significant differences shows little systematics, but there is one outstanding characteristic revealed in the subgroup differences: For all significant differences, the self-assessments of the counselors are lower than that of the respective subgroup. For the two significant differences at I, the observers rate higher than the counselors. At II and III, the higher ratings of the clients over the counselor's accounts for the significant difference.

Improvements   With respect to improvements, there is no significant change for any of the three perspectives. Neither a repeated measures variance analysis nor a paired sample t-test comparing I and III show any change. Looking at figure 8.13 this is plausible since there is basically no variance between the measurements.

Irregardless of significant changes there are a few items that show a similar trend across all measurements and from each perspective. A positive trend in the ratings can be found for the items 1 (client confides in counselor), 2 (counselor asks fitting questions), 7 (client feels in good

hands), 13 (client considers counseling important), and 22 (counselor keeps goal vivid). The first three of these items refer to the relation between the counselor and the client. An increase of these items may reflect the fact that the participants improved in the ability to create a stable relationship which could be observed from all perspectives.

A negative trend can be observed for the items 9 (client trusts in own abilities), 10 (counselor helps deciding), 11 (client realizes resources), and 12 (counseling supports behaving differently). These items may be seen more critically with each measurement reflecting in the negative trend.

Factorial Structure

To identify the underlying factorial structure of the DUGEP items, two sets of factorial analyses are calculated. First, a confirmative factor analysis seeks to replicate the eight dimensions of DUGEP - the Generic Principles. Second, an explorative factor analysis may reveal possible alternative structures.

Confirmative Factor Analysis   To validate the structure of the Generic Principles, an explorative factor analysis is calculated. For each measurement, there is one factor analysis, and three further analyses for each perspective in order to reveal the underlying structure. All factor analyses are calculated with Principal Component Analysis for extraction and Varimax with Kaiser Normalization for rotation. 8 factors were to be conformed for each analysis.

The overall results of the analyses shows that the factorial structure can not be reproduced. In most of the factor analyses for single perspectives (counselor, client, observer), not even one single Generic Principle can be identified including all items constituting the principle. For the other factor analyses, the items of two or more Generic Principles are found in one factor. In the factor analyses including all perspectives, the items covering the same content for each perspective are not found in the same factor. Aspects that often occur in the same factor are Generic Principle II (two items), as well as aspects of Generic Principle I and VI. Items of Generic Principles III and VII basically are never found in the same factor.

Explorative Factor Analysis   Since the confirmative factor analysis does not provide any interpretable results, an explorative factor analysis may reveal an underlying factorial structure in the data. For this purpose, two sets of factor analysis are calculated, depending on the aggregation of the raw data. First, a factor analysis is presented for which the data are aggregated across measurements. Second, a factor analysis is presented for which the data are aggregated across perspective.

Aggregation across Measurements   Aggregated across measurements, four factor analyses are calculated in order to find any underlying systematics. The first factor analysis incorporates

all data aggregated over all measurements. The separate analyses for the results for each single measurement are presented subsequently. All factor analyses are calculated applying the principal Component Analysis for the extraction and Varimax with Kaiser Normalization.

The rotated factor solution for all items aggregated over measurements results in 16 factors of which only five can be seriously interpreted. The resulting factor structure shows factors that are determined by the point of measurements rather than the content of the items.

1. III (all but six items), *can not be further specified*
2. II (15 items), *can not be further specified*
3. I envisioning goal and resources (8 items)
4. I new steps on safe ground (6 items)
5. II client-counselor relation (5 items)

At **I**, five factors are extracted, but only four can be interpreted.

1. (items 8, 9, 10, 11, 12, 18, 19, 20), *can not be further specified*
2. changing life (items 6, 16, 17)
3. goal-orientation (items 5, 15, 16)
4. counseling adapted to client (items 1, 2, 7, 21)

At **II**, seven factors are extracted. The definition of the factors regarding content is not possible, though. Many items load onto several factors, or there are too few items loading on a factor for a reasonable interpretation. For the factors with reasonable factor loading, the interpretation is difficult, since the corresponding items are very disparate. Thus, the result of the factor analysis is not presented.

At **III**, three factors can be interpreted.

1. changing life situation (items 8, 13, 15, 17, 23)
2. relevant system and resources (items 3, 5, 9, 10, 11, 14)
3. counseling adapted to client (items 2, 7, 19, 21)

As can be seen for the presented factor analyses, there is no coherent pattern in the extracted factors. The factorial structure differs from measurement to measurement. Although similar factors can be described they are not determined by the same items, thus, they can not be defined as the same factors since the item structure is different.

Aggregation across Perspectives   In total, four sets of factor analyses were calculated: one for each perspective and one across all three perspectives. For all factor analyses the Principal Component Analysis for the extraction and Varimax with Kaiser Normalization is applied.

The rotated factor solution for all items aggregated across measurements results in 16 factors of which only six can be seriously interpreted. The first three factors are determined by a perspective rather than the content of the items.

1. Observer (13 items), *can not be further specified*
2. Client (8 items), *can not be further specified*
3. Counselor - goal orientation (11 items)
4. relevant system (6 items; client and observer)
5. meaning of change for future (6 items; counselor and client)
6. changed perspectives (5 items; observer and client)

For the **counselor**, five factors can be extracted.

1. emotional and motivational support (items 8, 9, 10, 11, 12, 18, 19, 20, 23)
2. meaning of counseling for client (items 6, 13, 17)
3. goals (items 5, 15, 16)
4. client-counselor relation (items 1, 2, 7, 21)
5. identifying relevant system (items 3, 14, 22)

For the **client**, only three factors can be seriously interpreted whereas seven factors can be statistically extracted.

1. resource for solution (items 5, 9, 11, 15, 20)
2. goal orientation (items 10, 12, 14, 16)
3. *can not be further specified* (items 2, 17, 18, 19)

The interpretation of these factors is difficult, since quite a few items have a factor loading on several factors. This leads to the fact that several items are not represented in the factorial structure.

For the **observer**, four factors can be interpreted.

1. encouragement for future (items 6, 8, 13, 17, 18, 23)
2. resources and client's system (items 3, 9, 10, 11, 14)
3. client-counselor relation (items 2, 7, 18, 19, 21)
4. goal definition (items 4, 16, 20)

As for the aggregation across measurements, the factor analysis across all perspectives results in a factorial structure that is determined by the means of the primary aggregation. Measurement and perspective are the major ordering parameters in both. The contents of the incorporated items do not determine the factorial structure.

Summary

The concordance of the ratings by the interview participants shows moderate values but an increasing mutual consent from measurement to measurement (0.55 to 0.64). This reflects the gain of a common understanding of the items and their meaning.

The ratings of the interview participants show the same initial position for all items. At II and III, however, there are some items for which D8 has higher ratings over TU. But there is no systematic pattern in the items that show a significant difference. The overall level and even the range of the items does not change across the measurements. The level of the ratings is quite high, right from I on.

Looking at the ratings given by counselor, client, and observer it shows that the ratings basically do not vary at all and remain stable across the measurement. Significant differences between the perspectives appear incidentally; systematics can not be identified.

A confirmative factor analysis can not reproduce the structure of the items that were defined along the Generic Principles. An explorative factor analysis results in factorial structures that differ from measurement to measurement or perspective. No stable structure can be identified, though.

8.3.3 Ratings by external Raters

In total, there are 90 interviews documented with DUGEP. Like for DIDSYM, the video-taped interviews are assessed by two external raters with respect to the implementation of the Generic Principles. In contrast to DIDSYM, no rating scales are applied, but the intensity of each Generic Principle is measured throughout an interview. The implementation of the Generic Principles is divided into two areas. First, the counselor's intention with respect to the Generic Principles, and second, the client's reaction's in term of the Generic Principles.

This section describes the results of the coding of the interviews. First, the inter-rater reliability is presented, before the results of the process dynamics of the interviews are discussed in detail.

Inter-Rater Reliability

The inter-rater reliability is calculated with Kendall's coefficient of concordance (Kendall's W). To determine Kendall's W, four DUGEP ratings were taken at the end of the rater trainings and the concordance between both raters calculated. Due to the complexity of the DUGEP's rating schema, the concordance is depicted for the intention of the counselor (IC), reaction of the client (RC), and the concordance for the complete interview (total). Additionally to the test coding before the actual rating, one DUGEP rating is taken to reassess the stability of the coding behavior (see table 8.17).

As table 8.16 shows, the inter-rater reliability for DUGEP is quite high. There are no major differences between the three coding of IC, RC, or the concordance for the complete interview. So, it is assumed that the raters assign similar values to similar observed behavior.

Table 8.17 shows the concordance between the raters with one of the last DUGEP interviews that was coded. It shows that the concordance diminishes a little, but remains at a good level.

	Kendall's W		
	IC	**RC**	**Total**
1	0.87	0.61	0.74
2	0.88	0.86	0.87
3	0.87	0.86	0.85
4	0.88	0.94	0.91
average	0.88	0.82	0.84

Table 8.16: Inter-Rater Reliability, DUGEP

Kendall's W		
IC	**RC**	**Total**
0.80	0.75	0.82 (0.66)

Table 8.17: Stability Of Inter-Rater Reliability in DUGEP

This is remarkable, since the coding of the 181 video-taped interviews spanned several months. Due to software restrictions, Kendall's W was calculated for three quarters of the interview (W = 0,82). For the remaining quarter of the interview, the concordance is at W = 0.66.

The overall concordance of W = 0.82 for the most of the interview shows that over the time of the independent coding of the external raters, the coding behavior did not diverge too much, and can be considered as good. The decrease of the concordance within the last quarter of the interview to a moderate level, can be explained with the shorter interview sequence.

Progression of Interviews

The coding of the video-taped interviews results in graphical representations that reflect the interviews process. The external raters assess the intensity of each Generic Principle, once for the counselor's intention and second for the client's reaction. The intensity can be assessed in four categories, plus one exclusion category, when the respective behavior can not be observed.

For the interpretation of the DUGEP interviews, a qualitative approach is chosen. The color coding of the Generic Principles across each interview shows a macroscopical pattern that can be interpreted. For each interview, there is a figure for the intention of the counselor in implementing the Generic Principles and another figure depicting the reaction of the client. The occurrences and the characteristics of the Generic Principles over time reflects the interview process. There are four color shades that indicate the intensity (1 - 4; the darker the more intense). A blank spot means, that the Generic Principle could not be observed. Each time interval is two minutes long.

The results describe the findings, first for each Generic Principle, second, the joint examina-

tion of the Principles is discussed, before this chapter is concluded with the examination of the interview intensities which results in the identification of different interview types.

Isolated Examination on Generic Principles   The following section describes the characteristics of each single Generic Principle. It considers the occurrence frequency and the intensity, as well as possible differences between the subgroups TU and D8.

Generic Principle I   Generic Principle I (Creating Conditions of Stability) presents itself as a highly continuous pattern throughout all interviews. For the majority of all interviews it shows values of 2 or 3. The rating 1 and 4 are given considerably less often. There is no time interval in which it can not be observed, thus, the rating of 0 is not assessed by the external raters at all. This applies for the intention of the counselors as well as for the reaction of the clients.

Generic Principle I appears as a persistent stripe in the graphical representations from the beginning to the end of the interview. It varies in strength throughout most interviews, but there are interviews that show the same ratings for the complete interview or at least longer sections. With respect to this Generic Principle, variation in the counseling behavior can be observed more often in the interviews of D8 than TU.

Figure 8.14 shows the interview of GEHE48 (D8) at II. It shows the steadiness and persistence of Generic Principle I as well as for Generic Principle VI. This interview is quite intense, which is reflected by the high ratings of both principles for the counselor and the client.
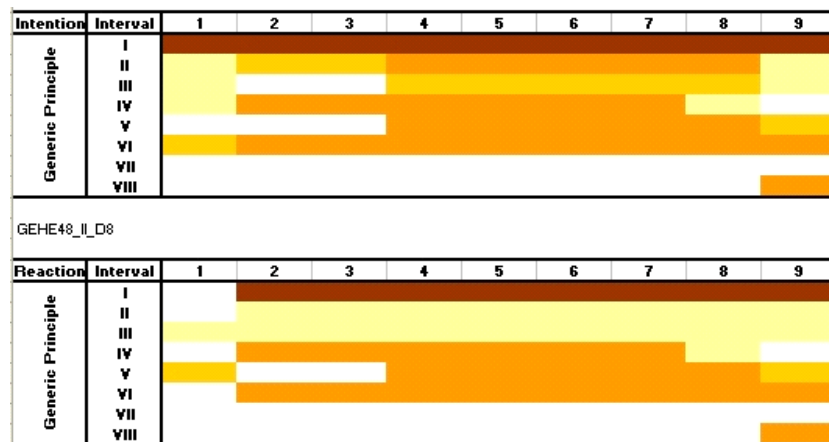
Figure 8.14: Steadiness of Generic Principle I and VI

Generic Principle II   Generic Principle II (Identifying patterns of the relevant system) can refer to problem or solution-oriented counseling behavior. In many interviews the rating starts at the

second interval, increasing the intensity from the succeeding interval on, and for most interviews the respective behavior can not be observed in the very last interval. The ratings of Generic Principle II often vary, sometimes it is even interrupted by rating the exclusion category 0. Ratings of 4 are extremely seldom, 1 and 2 are rated very frequently, and 3 is rated often as well. Often this principle has ongoing ratings for a majority of the interview.

Compared to TU, there is slightly more intensity fluctuation of this principle in D8. The longer interview durations of this subgroup may play a role since there is more time available. Besides this, there is little difference in the macroscopic counseling patterns for Generic Principle II.

Generic Principle III   In most interviews Generic Principle III (Sense-Making / Coherence) is observed. The characteristics are quite different, though. In some interviews, it is observed only sporadically for one or two intervals. In other interviews, the intensity increases to a steady characteristic throughout the complete interview. The ratings remain on a quite low level. The majority of the ratings equal 1 or 2. Rating 4 is only given in one interview for one interval, even 3 is seldom rated.

Very seldom it is rated in the first or last interval. With respect to the intention of the counselor, two types can be distinguished. First, the counselor maintains a rather low level consistently, and second, the counselor initiates respective counseling behavior again and again at different points in the interview. The reaction of the clients partly follows the counselors' intentions and there is a good match between the intention and the reaction. But quite often it is observed that the clients show a rating when the counselors do not implement Generic Principle III. As well, there is the variant that the clients show a higher rating than the counselors. For D7, both interviews follow the sporadic pattern.

Generic Principle IV   Generic Principle IV (Identifying Control Parameters / Enabling Energization) is observed in almost every interview. But, there are five interviews of TU in which Generic Principle IV is not implemented at all. In four of these interviews, the client does not show any reaction either. For D8, there is only one interview in which it is not observed, neither with the counselor nor the client. It is characteristic for this Generic Principle that there are intervals in which it is not observed, meaning that it is not continuously implemented in one stretch. Also, there are interviews in which its implementation is very short for only one or two intervals. This is observed predominantly by TU participants.

The onset of this principle lies between the very first interval and the middle of the interview, independent of the duration. When it is implemented, it shows clearly that D8 implements this principle with higher intensity. The ratings of TU range mainly between the values 1 and 2; a value of 3 is seldom, and 4 is never rated. The ratings of D8 range between 2 and 3, a value of 4 is seldom but does occur. For D8 it can be stated that - once implemented - it continues in varying intensities up to the end or when it is replaced by implementing Generic Principle VII

or VIII. This finding is also valid for D7.

Generic Principle V   This Generic Principle (Destabilization) shows a clear difference between
the subgroups TU and D8. For TU, there is no implementation of the principle in eight inter-
views, seven times this concerns intention and reaction of the same interview. For D8, this
principle is only missing in two interviews. The onset of this principle shows prototypically in
the middle of an interview.

With respect to the intensity of the ratings, the level is comparable to Generic Principle IV.
For D8 higher ratings are observed than for TU. Especially, for this principle it shows that it is
implemented less often than Generic Principle IV throughout an interview. Once implemented,
there are breaks. As the interviews of D8 are longer, this effect shows more clearly in those
interviews. The participants of D8 are more successful in implementing Generic Principle V,
more continuous counseling behavior with a higher intensity is observed.

Generic Principle VI   The course of Generic Principle VI (Synchronization / Resonance) is
similar in its characteristics to Generic Principle I. As well, it shows ratings from the beginning
to the very end. The ratings usually range between 2 and 3. The ratings 1 and 4 are less often
applied than for Generic Principle I. As for I, there is no single rating of 0. The ratings vary with
respect to their intensity but basically they show a very stable pattern. Often the same ratings
are given throughout the complete interview. Where there is a change in the ratings, they often
maintain the same level for a few intervals rather than alternating back and forth. This shows in
the intentions of the counselors as well as in the clients's reactions.

Although, there is not much difference between TU and D8, D8 shows more variation in
implementing this Generic Principle. Even more variance can be observed with the two reference
interviews of D7 (see figure 8.15). Both interviews show a succession of different ratings from
interval to interval, and thus, obviously differs from the other interviews.
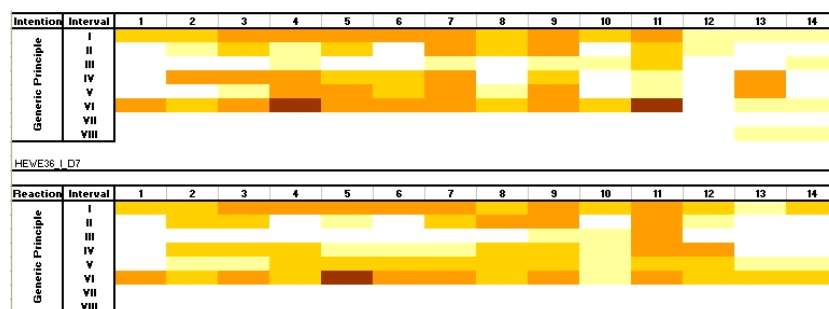
Figure 8.15: High Variation in Generic Principle VI

Figure 8.15 reflects this high degree of variation in Generic Principle VI. HEWE36 (D7)

changes the intensity basically in every interval, and the client follows with comparable varia-
tion. In contrast to this interview, figure 8.14 shows a very constant level of this principle and
therewith represents a more widespread pattern.

Generic Principle VII   Generic Principle VII (Enabling Symmetry Breaking) is implemented
very seldom. Only 3 TU and 5 D8 participants apply it at all. This clearly is connected to
the content to the interviews. Since all interviews were considered to be initial interviews the
difficulty of breaking a symmetry between two equal options is less likely to occur. Whereas
Generic Principle VII appears only extremely sporadically in TU interviews, for D8 the symme-
try breaking stretches over more intervals and receives higher ratings. All intentions of imple-
menting Generic Principle VII - but one - happen in the last third of an interview. This provides
some face validity as in the previous section of the interview the necessary material has to be
developed for creating a situation in which symmetry can be broken.

The most pronounced example of Generic Principle VII is the second DUGEP of REKA 47
(see figure 8.16). As can be seen, it dominates the last third of the interview in a high intensity
(ratings 3 and 4). At the same time as the Principle is implemented, all the counselor's activities
in Principle IV and V cease.
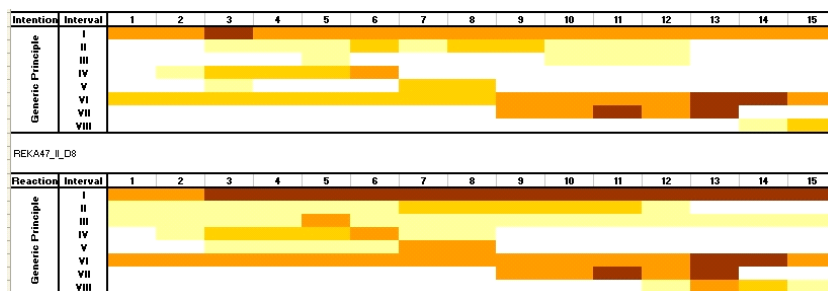
Figure 8.16: Onset of Generic Principle VII

Generic Principle VIII   Counseling behavior that covers re-stabilization is observed with 50 %
of TU participants and with all but one participant of D8. No top ratings (4) are given. The
ratings 1 - 3 are given in equal shares. Generic Principle VIII is rated typically at the very
end of an interview, spanning one or two intervals. Three or more intervals are seldom and
are mainly observed with D8. As the implementation of Generic Principle VIII covers more
intervals, it shows in these interviews that the intensity of the counseling behavior can vary
with each interval, but steady phases are just as common. The implementation of this Generic
Principle does neither increase in frequency or intensity across the measurements. It seems that
the content and course of the interview determines the implementation of this principle.

Joint Examination of Generic Principles   After discussing each Generic Principle separately, this section reviews the correlations and specific combinations of the Generic Principles.

Stability and Resonance The most evident covariation between two principles is the simultaneous occurrence of Generic Principle I (stability) and VI (resonance). Both have continuous values from the beginning to the end of each interview without any disruption.

For all interviews, it shows that the general level of Generic Principle I is usually identical with the level of Generic Principle VI, but even higher in many cases. This is independent of the membership to a subgroup and independent of the point of measurement. But, there is a higher intensity of both principles for D8.

Generic Principle II **Identifying Patterns** does not seem to follow a specific pattern with respect to correlations to other principles. It neither correlates consequently with I or VI, nor does it correlate with III, IV, V, and VII. There is no variation in intensity when those principles are implemented. The least overlap occurs with Generic Principle VIII.

Sense Making Considering Generic Principle III with the other principles, there is not only one specific pattern, but three types appear. First, the principle is not implemented at all, and thus, there is no correlation with the others. Second, there is a constant, underlying implementation; in most cases for the complete interview and with a low rating. In this case, there is no meaningful correlation in the course of the principle's values with others. Third, the principle is implemented quite sporadically and - if implemented - occurs in combination with other principles, that suddenly are implemented or intensified. In this case, this is observable as a "block" of many implemented Generic Principles - mainly II, IV, V, VII - since I and VI are already implemented.

Energization and destabilization seems to occur together often, in many cases with a lag of Generic Principle V in relation to IV. Although, there are interviews in which only the one or the other principle is implemented.

When discussing Generic Principle IV and V separately, it is noted, that D8 has more occurrences and higher ratings for both. This is also valid for the joint examination of both principles. It also shows, that - if IV is successfully implemented by D8 participants - Generic Principle V follows less often than by TU participants. For TU, it seems that IV and V are more equally applied. D8 participants are able to implement both principles with a high intensity at a higher percentage compared to TU participants. The counseling behavior of TU seems more selective in the implementation of the Generic Principles IV and V.

Symmetry Breaking There are not very many occurrences of Generic Principle VII, and then, with often low ratings (see 8.3.3). This impedes a thorough discussion of the correlation with other principles, but some principal thoughts can be considered. It becomes obvious that in most cases, Generic Principle VII is not implemented at the same time as IV or V; or, at least, the intensity of those is reduced. The Generic Principles I, II, III, VI are not influenced, and there are only two interviews in which there is partly an overlap between VII and VIII.

Re-stabilization When it comes to re-stabilizing counseling behavior (Generic Principle VIII),

the activities related to the Generic Principles II, III, IV, V, and VII either stop or decrease in their intensity.
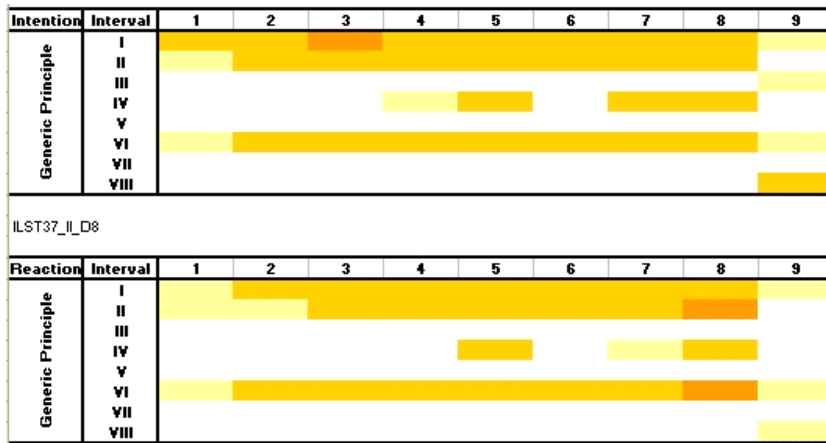
Figure 8.17: Onset of Generic Principle VIII

Figure 8.17 presents the onset of Generic Principle VIII of ILST37 at II. It is a very short attempt of re-stabilization, but it shows the reduction of the implementation of other Generic Principles. The reaction of the client shows this even more clearly. Although, there is no observable reaction with respect to Generic Principle VIII, the reactions with respect to all Generic Principles cease all together, when the counselor implements Generic Principle VIII.

Interview Intensity   For D8, it can not be stated that the intensity and the frequency of occurrences does increase from I to III. Either the intensity and frequency stays basically the same over all interviews, or there is even a decrease from I to III. This fact can also be found for the interviews of TU, but here it is less pronounced, maybe due to the shorter interview duration. In this subgroup, there are more participants for whose interviews there is no change. Although, some participants do increase the intensity from I to III.

The Generic Principles I and VI can be considered as the foundation upon which behavior can be destabilized and new behavioral and emotional patterns can be acquired. High intensities of both principles occur with very intensive interviews but also with interviews of rather low intensities.

Low intensities in Generic Principle I and VI, however, are observed in interviews that show low intensities in the other Generic Principles. As well, in these interviews less Generic Principles are implemented. It seems like - with the low intensities of I and VI - these interviews are missing the necessary foundation for developing further change activities.

Thus, low ratings in Generic Principle I and VI are accompanied by low intensities in the other Generic Principles. High ratings involve both high and low ratings in the other principles.
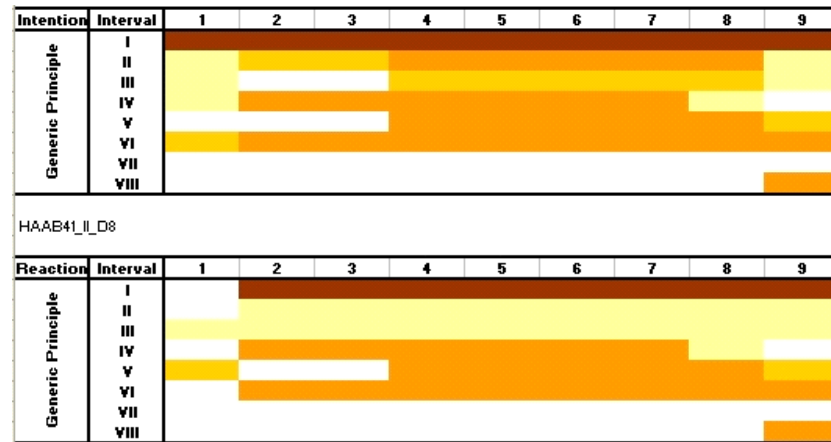
Figure 8.18: Block Type Interview

Different "Types"   There are six different interview types that can be distinguished by the macroscopical pattern of the interview dynamics. There are three base types, and three combinations of them. This categorization is done for the counselors' intentions. Since there is a high correlation between intention and reaction, it is valid for the clients also (see page 182). The different types are listed and described in the following.

The **"block type"** (see figure 8.18) describes an interview in which the counselor implements many Generic Principles at once at a rather high level and continues them for at least three intervals. This usually involves the Generic Principles I - VI. In D8, block types occur in 11 of 44 interviews. In TU, they are observed in 4 of 39 interviews.

The **"stripe type"** (see figure 8.19) shows continuous implementations of a Generic Principle over a very long stretch of the interview on - more or less - the same level. Usually, only a few of the principles besides Generic Principle I and VI are implemented; very seldom is a different principle implemented and these only for very few intervals.

The **"hole type"** (see figure 8.20) is characterized by many interruptions (blanks in the diagram) in the course of single Generic Principles. This does not concern Generic Principle I and VI, since they continue throughout the entire interviews. Next to numerous blanks, this type is characterized by a higher variance in the ratings within a Generic Principle.

The three characteristics - block, stripe, and hole - can be combined and form the following three subtypes.

The **"hole-stripe type"** (see figure 8.21) is the most common of the subtypes. It combines characteristics of stable stretches of Generic Principles interrupted by breaks. The Generic Principles are not implemented all at the same time.

Figure 8.19: Stripe Type Interview

Figure 8.20: Hole Type Interview

Figure 8.21: Hole-Stripe Type Interview
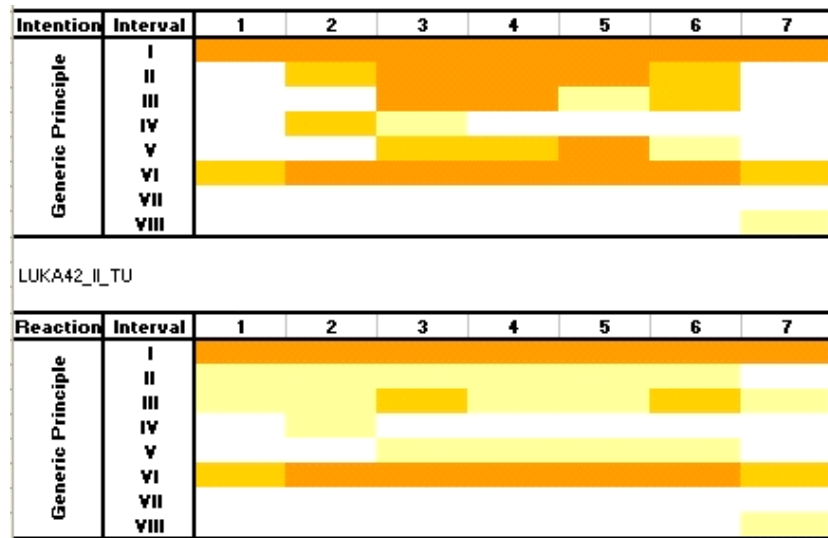
Figure 8.22: Hole-Block Type Interview

The **"hole-block type"** (see figure 8.22) is categorized when the prerequisites for a block type are not given (high ratings of many Generic Principles for at least three intervals). Though, there is at least one section of the interview with a "block-like" feature. The rest of the interview is dominated by hole-type characteristics.

For the **"stripe-block type"** (see figure 8.23) applies the same considerations as for the hole-block type, but next to block-like characteristics, the rest of the interview is dominated by stripe characteristics.

Table 8.18 presents the frequency for each interview type. Additional to the total number of each type, the distribution between the two subgroups over all measurements is shown. The two reference interviews of D7 are both hole type interviews but not listed in the table.

As table 8.18 shows the most common interviews types are hole type and hole-stripe type whereas the block type is the least common interview type. Considering the distribution between TU and D8, it shows that D8's types concentrate on the hole type whereas TU concentrates on hole-stripe type and stripe-block type.

Considering the distribution of the interviews across the measurements (see table 8.19), there are three developments to be reported. First, the number of the "hole type" and the "block type" and the "stripe type" interview increases slightly. Second, the "stripe-block type" interview decreases from 4 at I to 1 at III. Third, the hole-block type decreases from 7 to 4. The frequency of the other interview types remains very similar across the measurements.
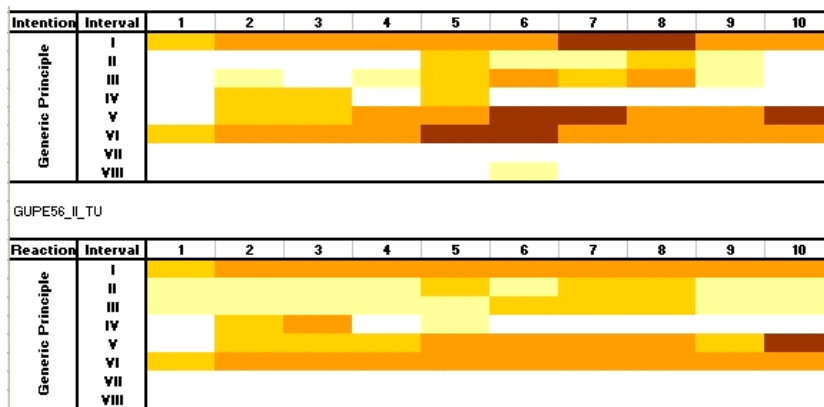
Figure 8.23: Stripe-Block Type Interview

	D8	**TU**	**Total**
Block Type	6	2	8
Stripe Type	8	5	13
Hole Type	14	2	16
Hole-Stripe Type	8	10	18
Hole-Block Type	6	7	13
Stripe-Block Type	1	9	10

Table 8.18: Distribution of Interview Types Between Subgroups

	I	**II**	**III**
Block Type	1	3	4
Stripe Type	2	5	6
Hole Type	6	5	5
Hole-Stripe Type	7	4	7
Hole-Block Type	7	2	4
Stripe-Block Type	4	5	1

Table 8.19: Distribution of Interview Types Between Measurements

It seems that the interview type depends less on the measurement than on the considered subgroups.

Dependency between Intention and Reaction   On the macroscopical level, there is a good match between the interview patterns of the counselors and the clients. The basic patterns are concordant with respect to the relative onset of the Generic Principles and the variance of the intensities - if not even exactly the very same pattern. There is no 1:1 match between the intention and the reaction but the synchronization of both patterns and color codes are obvious. One basic statement can be made: there is a very high correlation between the reactions and the intentions. The clients show no reactions that are not initiated. This statement is true, with one exception: Generic Principle III. There are various interviews, in which the client shows Generic Principle III continuously, whereas the counselor does not either implement it or only implements it occasionally. This happens in 10 D8 interviews and in 3 TU interviews. This finding can be explained, looking at the external rater. Without exception, all interviews in which Generic Principle III is rated higher on the client's side are coded by the same rater.

With respect to subgroup differences, there are no differences in the correlation between intention and reaction for many interviews. But for TU, there are more interviews for which the intentions and the reactions differ noticeably. On the other side, there are more interviews of D8 for which the match between both is extremely good. This suggests, that more experienced counselor can implement counseling behavior that creates a better match.

For seven interviews the client shows a considerable higher intensity than the counselor (6 D8, 1 TU). The measurement does not show any influence, these interviews are distributed over all measurements. The factor which causes this result can be found with the external rater again. For six out of the seven interviews, the same rater as above rated the videos with the higher intensity in the reaction than the intention. Five of these interviews also belong to the group in which Generic Principle III is predominantly in the clients' ratings, which increases the occurrences for the complete interview.

Summary

For the coding of the DUGEP interviews by different external raters a good inter-rater reliability is needed. The concordance between both raters shows a good inter-rater reliability that decreases a little bit throughout the coding period but still is considered good.

The coding of the interviews results in graphics that represent the interview dynamics with respect to the Generic Principles. This shows some striking characteristics: Generic Principle I has persistent ratings throughout all interviews. There are no differences between the subgroups D8 and TU. Generic Principle II also occurs often but on a lower intensity and with more breaks, again without differences between D8 and TU. Generic Principle III reveals three types of usage, although it occurs in almost all interviews on a low level: either, it is consistently implemented

by the counselor, or it is implemented in an on-and-off mode, or the client shows a rating even when there is no intention by the counselor. Generic Principle IV has less of stripe characteristics and shows more breaks. D8 implements this principle with a higher intensity and with more varied intensities. Generic Principle V usually starts showing up in the middle of the interview and is more often implemented by participants of D8 than TU. D8 receives higher intensities and with more breaks. Generic Principle VI has very similar characteristics to Generic Principle I. It is continuously implemented by all participants, whereas D8 shows more flexibility in intensity. Generic Principle VII is very seldom implemented; if it is, D8 does so for more intervals and more intense than TU. Generic Principle VIII is more often observed with D8. This principle usually displaces the Generic Principles II, IV, V, and VII when implemented.

Across the measurements, there is no obvious increase in intensity, thus, a competence gain can not be stated but one condition for high intensive interviews can be identified: High intensive interviews only occur, when Generic Principle I and VI have high intensities. Without those, the interviews remain a low or - at best - moderate level.

Comparing the macroscopical pattern of the interviews, six types are distinguished: hole-type, block-type, stripe-type, hole-stripe type, hole-block type, and stripe-block type. It shows, that D8 has more hole-type interviews, whereas TU has more hole-stripe type and stripe-block interviews.

In general, it can be stated that there is a very good match between the intention of the counselors and the reaction of the clients.

8.3.4 Conclusion

For the interviews with DUGEP an improvement of the interview duration for the total group is observed. This improvement is mainly due to the improvement of the participants of TU. Although, the duration in the interviews of D8 increases, this development itself is not significant. Comparable to the findings in DIDSYM, D8 participants are able to hold longer interviews than the participants of TU.

Contrasting the interview durations of DIDSYM and DUGEP, the longer durations of the DIDSYM interviews are revealed. The difference is highly significant. The more formal process of the Idiographic System Modeling requires more time than conducting a solution-oriented interview.

The rising concordance reflects the increasing mutual consent of the DUGEP items. Regarding the assessments of the interview participant this is the only results that shows any kind of improvement. There is neither (meaningful) improvement across measurements nor when split up by perspective. The overall rating level is quite high from the first measurement on, though. Considering the subgroups, there are no differences at I, but at II and III, D8 participants show higher ratings in some items but there are no systematics behind these differences.

The dimensional structure along which the items of DUGEP are constructed can not be reproduced in a factor analysis. The factorial structure changes with each measurement.

The coding of the video-taped interviews reveals interview dynamics with respect to the Generic Principles. There is no clear finding that supports competence gain in the interviews in terms of higher intensities or the implementation of more Generic Principles more often. But there are many hints that D8 participants show a different interview behavior that reflects in the Generic Principles. More experienced counselors are able to vary their counseling behavior more flexibly than inexperienced who tend to maintain some Principles at the same level for quite a while. This shows in the identified interview types as well as in the use of single Generic Principles.

Chapter 9

Discussion

This final chapter discusses the findings of the previous chapter and the implications for research and systemic trainings. The first part considers the consequences for the construct Systems Competence followed by the discussion of the empirical results. After this, a concluding examination is given and the future work presented.

9.1 Theoretical Classification of Systems Competence

This section presents the theoretical considerations and implications from Synergetics and competence research. First, the differences in the use of the term "self-organization" in Synergetics and competence research is discussed. Second, the structure of the construct systems competence is critically reviewed leading to a newly structured competence model.

9.1.1 Conceptualization of Self-Organization

The concept of self-organization is fundamental for the theoretical background of this thesis. Synergetics and competence research both refer to concepts of self-organization. This section discusses the overlaps and differences in the present definitions.

Self-organization in Synergetics describes intra-systemic processes for shaping a stable, coherent macroscopical behavioral pattern. Unlike cybernetic models, Synergetics stresses that there is no instance which determines a system's internal structure but the structure (order) evolves from the mutual dependency and interaction of the system elements. The circular causality between order and system elements does not allow for making a statement about the direction of influence. The variation of control parameters allows the possibility to change this order. At points of instability, small quantitative changes on the control parameter are sufficient to result

in a sudden qualitative change. Coherent cognitive, emotional, and behavioral patterns arise and stabilize themselves.

Self-organization in competence research refers to learning settings that are open with respect to the goal of a developmental process. A process is self-organized when the learning targets, operations, and strategies, as well as their monitoring, are selected and implemented by the learning system during the process. This enhances and enriches the system's dispositions. In this context, competences are considered dispositions for self-organization. Thus, self-organization in competence research is determined by first, the openness of a system's developmental path, and second, that the system itself receives an active role in mastering this open situation by applying competences. In this context, self-organization resembles a learning process.

Comparison of the meanings of self-organization shows that in spite of the same terminology, both areas concentrate on different aspects of change processes. Whereas competence research uses the term in learning settings that are aligned for improvement; in Synergetics, self-organization is used for the dynamics of going from one stable state to another. Here, self-organization is not tainted with an improvement or worsening, the result of the change is non-judgmental.

The openness of the self-organization process with respect to the final result is considered in both conceptualizations; it is even essential for the understanding of the concept in competence research. In Synergetics, the critical fluctuations at the point of instability determine the resulting order after an order-order-transition; the resulting order is not predictable, though.

The base model of Synergetics describes the internal processes and dependencies of various components determining a system's state. The Generic Principles provide a detailed and hands-on competence compilation for supporting change processes. In self-organized learning, there is little information about the internal structure of the process itself. By defining four learning styles (self-organized, self-regulated, organized by others, regulated by others) there is a helpful categorization to describe these learning processes. This categorization describes the processes from the achieved result rather than from the dynamics of the process.

Synergetics is a theory of self-organization and as such it is missing an entity which determines a system's development and characteristics. In the conceptualization of self-organized learning, however, the subject (the learning system) receives an active role in designing the developmental process. The subject becomes the pilot of its own path albeit the direction is unclear at times. In Synergetics, there are different parameters and system-internal components that determine the system's next state, not a single entity. Also, these can not be directly influenced at all times. Applying this model to counseling, by providing the appropriate settings plays a crucial role in a counseling process. By identifying control parameters and supporting symmetry breaking towards a certain order, a counselor has some influence on the system's development.

The concept self-organization in Synergetics is theoretically more founded and is of essential meaning for the complete theory. In competence research, the concept is more of an accessory

character for the categorization of competences and their evaluation.

9.1.2 Suitability of Systems Competence as Competence Model

An appropriate competence model categorizes competences in a common framework upon the description of the theoretical background. As such, it provides a bridge between theoretical and conceptual considerations and allows the derivation of hands-on activities. Since many competence models are lacking the embedded framework and superordinate conceptualization (compare section 3.1.3, page 59), systems competence is critically reviewed for its suitability to serve as a competence model in the following.

Systems competence is directly deducted from the Synergetical framework listing competences, abilities, and skills necessary for counselors to work with complex social systems. The level of abstraction varies, there are some hands-on activities listed (e.g. waiting for yes-sets) but also highly abstract entities (e.g. Generic Principles).

In order to classify systems competence it is discussed with each major presented concept (see sections 3.1.2 and 3.2).

Systems competence can not be classified as a **qualification** (see section 3.2.1). Qualifications are derived from objective requirements of a work task and individuals are assessed how well they meet them. At the time, the level of an individual's system competence is neither tested or certified by any institution. For being defined as a qualification, systems competence contains too many complex aspects. Also, qualifications are task-centered whereas systems competence is clearly subject-centered - or better - system-centered.

Key qualification (see section 3.2.2) is a superior concept to qualification. It enables individuals to acquire new knowledge and qualifications needed in specific situations. Compared to key qualification, the concept competence is more comprehensive. It integrates cognitive, social, communicative, motivational, volitional, and action dispositions, whereas key qualification focuses on cognitive aspects only. Systems competence contains more than just these cognitive aspects, thus, it can not be defined as a key qualification.

Metacompetences (see section 3.2.4) enable the individual to develop competences. They allow to adequately assess the availability, potential benefit and learnability of competences. Systems competence as a whole does not exclude the possibility of selecting or acquiring new competences, but it does not explicitly focus on it. However, there is one exception within the construct: The Generic Principles (see section 2.2.2) serve as a guideline for selecting appropriate counseling techniques and interventions. This involves judging the availability and potential benefit of a counselor's complete set of competences and techniques. Thus, by restructuring the Generic Principles into one category and rephrasing it, a metacompetence can be defined (see figure 9.1 on page189). This understanding overlaps with the understanding of metacompetence as a universal ability for problem solving (see page 69).

The concept **key competence** describes important or essential competences which are considered as high-order competences. The most important conceptualization of key competences by Erpenbeck and Rosenstiel (see section 3.1.3) categorizes competences along the object of reference (oneself, social environment, professional tasks, and actions) that are themselves complex. Systems competence is not structured along these four competence classes but follows dimensions with regards to the content. The first dimension (Social competences) can be regarded as a key competence. Dimension 2 lists various aspects, which can not be considered as competences; they are defined quite vaguely and have more the character of recommendations. However, the aspects of dimension 3 lists some competences again. The content of dimension 4 (Developing Conditions for Self-Organization) can not be regarded as competences; the Generic Principles are more guidelines than competences. The dimensions 5 and 6 can not be regarded as competence categories; they comprise many exclusive aspects of knowledge and statistical procedures, including some evaluation procedures. Personal competence, professional-methodological competences, and action competences are not defined as such in systems competence.

By defining competence as the ability to successfully meet complex demands (see page 59), systems competence can be defined as a **competence**. Also, it can be defined as disposition for self-organization. Self-organization (see page 59) focuses on the ability of a system to align itself in undefined and open-goal scenarios. Competences are the base constituents of this development providing the necessary techniques and procedures for supporting change processes.

Upon these considerations a revised version of the construct system competence is presented that follows the categorization of competences by Erpenbeck and Rosenstiel (see section 3.1.3, page 62). Along with this re-categorization, the construct receives a different emphasis putting the Generic Principles into a central position. The construct is now renamed into "Competence for Managing Self-Organized Developments (Systems Competence)". This emphasizes the intention of managing change processes of complex systems rather than just on managing complex systems. The competence for developing conditions for self-organization is a metacompetence which allows the selection of appropriate techniques, procedures, and the implementation of competences (compare with characteristics of a metacompetent actor, section 3.2.4). The revision of the construct is depicted in figure 9.1.

Below this top level competence, there are three key competences: social-communicative competence, professional-methodological competences, and personal competence analogous to the presented framework by Erpenbeck and Rosenstiel. The content of these three categories is restructured from the dimensions 1 - 3 and 5 - 6 (for the full description of the dimensions in German, see (Haken & Schiepek, 2006, pp. 671-673)). Dimension 5 (knowledge) and 6 (pattern recognition and pattern modeling) are integrated and compressed in the category professional-methodological competences. The content of the dimensions 1 - 3 is divided between the categories social-communicative competences and personal competences depending on the object

Competence for Managing Self-Organized Developments (Systems Competence)		
Competence for Developing Conditions for Self-Organization		
Generic Principle 1: Creating conditions of stability Generic Principle 2: Identifying patterns of the relevant system Generic Principle 3: Sense-Making / Coherence Generic Principle 4: Identifying Control Parameters / Enabling Energization Generic Principle 5: Destabilization	Generic Principle 6: Resonance / Synchronization / Kairos Generic Principle 7: Enabling Symmetry Breaking Generic Principle 8: Re-Stabilization Heuristic competences (information search, increasing search space, creating analogies, competence enhancement)	
Social-Communicative Competences	Professional-Methodological Competences	Personal Competences
Cooperation – Clarifying competences, roles, tasks, and expectations – Competence for teamwork – Ability to delegate – Ability to act plan-complementary (plan analysis) – Presenting convincingly with respect to content and didactics – Giving constructive feedback – Conflict management – Competence for cooperation with other disciplines Contexts – Being sensitive for language, rules, manners, and cultures – Using comprehensible context-fit wording – Comprehending different ways of thought – Considering formal and informal system structures and inherent rules – Considering receptiveness of others – Supporting self-esteem of others – Empowerment, jiu-jitsu principle for others – Resource identification, development, activation – Creating affiliations, cultures and corporate identities Interaction Process – Changing between action and reflection – Adapting frequency of interventions according to system – Avoiding time pressure, slow pace – Waiting for invitations, yes-sets – Utilizing rituals – Developing perspectives, orientation, goals	Knowledge in Synergetics and theory of complex nonlinear systems Basics in: – Psychology, social psychology, sociology, salutogenesis and resource research – Neurobiology and psychophysiology, psychotherapy processes, psychoneuroimmunology and -neuroendokrinology – Philosophical basics and epistemic questions in psychology, neuroscience and system science Knowledge about: – Mental disorders; clinical and etiological knowledge, psychotherapy research – Research strategies in psychology, psychotherapy and systems science – Methods of evaluation and quality management in therapy and counseling – Methods and procedures of measuring in psychology and psychophysiology – Procedures for clinical case studies – relevant questionnaires and tests Experiences in conducting and analyzing system role plays (life-simulation) Understanding of computer simulation Knowing methods for analyzing process data Experience in managing, analyzing, and interpretation of computer-based synergetic navigation system Knowing about families, life and development phases	Emotions and Motivations – Supporting own self-esteem – Reflecting own emotional schemata – Dealing with emotional stress, knowing coping strategies – Self-reinforcement, enhancing own living quality – Empowerment, jiu-jitsu principle for oneself – Identification, development, activation of own resources – Clarifying own motivation and engagement Process Aspects – Handling irreversibility, immutability, chronification in a relaxed manner – Dealing with the limitations on planning, forecast, growth, and chances for change – Focusing, concentrating Making use of assistance, support, social networks, information Tolerance towards ambiguity
Action Competences		

of reference. Additional to this reorganization, content clusters are introduced in each category. The action competences - as the fourth group of key competences - form the foundation of this competence model. They are necessary to put the competences into action and are not further defined.

Each key competence lists a number of competence, skills, and abilities useful in the process of managing developmental processes. They are the inevitable building blocks (dispositions) for a counselor to support a self-organizing development. Hereby, the different conceptualization of the term "self-organization" have to be taken into consideration, in order not to confuse the different intentions (compare section 9.1.1).

This categorization of systems competence offers several advantages over the initial solution by Haken and Schiepek: First, it is more compressed than the initial compilation of learning targets. This helps developing curricula for counseling trainings. Second, it is consistent with the state-of-the art findings of competence research. Third, it emphasizes on the management of self-organizing change processes by centering the Generic Principles.

Concluding, it can be stated that the construct systems competence is a true competence model. This shall be demonstrated by applying five criteria concerning the use of the concept of competence (Weinert, 2001, pp. 62-63). First, the competence structure of the construct systems competence is derived from theoretical and practical considerations and is adapted to the needs of counselors managing self-organized change processes. Second, the model integrates professional-methodological, motivational, personal, social-communicative, and action-related components. Third, the complexity of managing self-organized change processes is very high, thus, using the concept of competence is appropriate. Fourth, learning processes are necessary to cope with the challenges in managing. Learning and adapting to new situations is essential. Fifth, metacompetences and key competences are basically meant for conceptual use. The competence for developing conditions for self-organization describes declarative and procedural knowledge about one's own competences.

9.2 Evaluating the Gain of Competence

This sections discusses the gain of competence for each area. There is a general increase of scores and ratings for the areas "Knowledge" and "Idiographic System Modeling", whereas the the results for the "Generic Principles" suggest an invariant process. These findings are critically reviewed and the implications discussed.

9.2.1 Knowledge in Synergetics

The results of WIGSY show clearly the knowledge gain of all participants on a very high significance level. This development shows for the complete test as well as for each subsection.

The different experience levels of TU, D8, and D7 has no influence on the scores at I, since Synergetical knowledge is not part of the training in the systemic training institution.

Throughout each evaluation it shows that university students receive higher scores in the complete test and four of the five subsections even although these differences are not statistically significant at all times. Nevertheless, this finding shows an important difference between the subgroups TU and D8. Whereas the university students are used to acquiring knowledge, reading and comprehending theoretical considerations, D8 participants have a different focus. This group consists of more practitioners who are less exposed to theoretical and conceptual foundations and less used to acquiring new knowledge. The higher scores of D8 in the subsection "Attitudes" is explained by the importance these concepts receive right from the beginning in the systemic training. Even more surprising is that these differences are not significant.

The comparatively high learning rates for "Idiographic System Modeling" and "Generic Principles" are attributed to the implementation of both concepts in counseling interviews. Thus, the theoretical foundations gain practical relevance and they are reflected more often than the other subsections for which the knowledge gain is lower.

The learning curve shows one peculiarity. At II, there are more significant differences between the subgroups than at the other measurements. These differences are diminished at the last measurement. The effort put into the training by the university students is the most likely explanation for this finding. Toward the end of the semester, and with the increasing workloads of the students, the effort put into the training and studying is reduced. The learning rate of D8 is also reduced but less pronounced than for TU. It has to be stressed that - in spite of significant differences - the actual difference is not very meaningful.

Across all measurements, there is a linear learning curve for the complete test. For each subsection different learning curves are revealed, though. For "Definitions" and "Generic Principles" there is a higher gradient in the second training round than for "Idiographic System Modeling" and "Synergetics". It can not be assumed that the perceived relevance for practical acting of the subsections leads to different learning curves otherwise the Generic Principles should gain more attention in the second measurement. At this point, it is considered an effect of the teaching methods. The training introduces the Idiographic System Modeling with an extensive live-demonstration. As well, the base model of Synergetics and the phase transitions have a high degree of experiential learning. The definitions and the basics of the Generic Principles are taught with many examples and group work but have a less degree of experiential learning units. As a result, experiential teaching and learning is considered to be highly valuable to center attention on certain aspects better than with other methods of activating participants. Therefore, the teaching methods in counseling trainings have to receive a high degree of attention.

Despite the substantial knowledge gain of 31.6 percentage points, only fifty percent of the achievable score is obtained at III. The training has a very high practical orientation and concentrates on conducting counseling interviews. Although, the theoretical foundation may be seen as important by the participants, their true interests can be assumed to lie in learning how to con-

duct interviews, which again may reduce their motivation to immerse themselves into theoretical and conceptual basics. This certainly applies for D8 participants who joined a systemic training institution that concentrates on conveying interview competences, but also for the participants of TU seeking a class with practical orientation.

Theoretical input and knowledge transfer can be considered a standard procedure in adult education programs. For conveying knowledge to the participants it has to be watched that it is connected to the practical learning contents of the training. WIGSY tests knowledge about counseling procedures that are put into action. Statistically, there is no correlation between the knowledge gain and the counseling behavior.

Three conditions can be described which are thought to increase the learning rate.

- **Stronger integration of definitions** The implications and consequences of the definitions for counseling interviews have to be focused more.
- **More repetitions** Despite the spiral curriculum, the repetitions may not have been enough to ensure appropriate acquisition of all content provided.
- **Stronger support of self-organized learning** Although reading materials were handed out, more materials and knowledge resources can be offered to stimulate the self-organized learning behavior.

For WIGSY, there are two points of criticism: First, there is no parallel version of the knowledge test. The same materials were used in each evaluation round. Therefore, learning effects may stem from the materials themselves. Second, the questions of the subsections are of different difficulty levels. "Attitudes" contains multiple-choice questions which may be easier to answer than open-ended questions, like for "Synergetics". The varying difficulty level, thus, may have influenced the extent of the knowledge gain in the respective subsections.

9.2.2 Idiographic System Modeling

Several indicators show an improvement in system modeling. It also shows that - when there are significant subgroup differences - D8 receives higher ratings than TU participants. These basic findings are not as clear-cut as for the knowledge test, though, and have to be discussed in more detail.

The assessments of the interview by the interview participants are on a very high level from the beginning on - a finding that is also valid for the DUGEP interviews. A significant improvement across the measurements is observed, although there is only a gain of 0.2 on the answer scale from 1-5. The meaning of this gain with respect to the counseling competence can be doubted. This improvement is even based only on the ratings of the clients and the observers. The assessment of the counselors remains stable. This raises the question what actually is assessed when asking interview participants. As mentioned earlier, self-ratings prove difficult as

competence measurements, since the ratings are influenced by the social situation (section 3.4.1 on page 80 or section 6.3 on page 107)). Also, it can be questioned if the competence perception of oneself is less flexible than the perception of the same competences by others (see section 3.3.5 on page 77).

Looking at the context of both subgroups, a strong influence of the social situation into the ratings can be assumed. The participants of D8 make a commitment of two years, get to know each other, and often enough, close friendships form within the peer groups. The university students are less committed since they only form a group for a restricted amount of time, but nevertheless, they are all students who frequently interact with each other in seminars and lectures. The participants of both groups can anticipate that they will have to work together for a considerable amount of time - throughout the training and even afterwards. Also, by interchanging the interview roles on a regular basis, every participant was subject to feedback in the role of the counselor. Participants who give negative feedback consistently may expect to receive negative feedback from the others.

It can be assumed, that both factors lead to the establishment of a very well-meaning feedback culture which reflects in the high level of the ratings. With the ratings being on this level already, they can not be increased from measurement to measurement excessively if a variance in the ratings shall be maintained. This explains the slow gain in the ratings. For the counselors whose ratings remain stable even more self-restrictions become important. It can be assumed that the differentiated self-observation proves difficult for individuals, which results in quite uniform assessments across the measurement.

The external raters state an improvement of the counseling behavior that is more pronounced than the assessment by the interview participants. This is true especially for the items that describe the core of the Idiographic System Modeling. This improvement shows in the higher occurrence rates as well as for the level of the ratings across the measurements. The improvement happens in two steps: from I to II, the number of occurrences is improved; from II to III, the level of the ratings is improved. Whereas the first training round improved the diversity of evaluation criteria by introducing the method, the repetition of the method in the second training round improved the quality of these criteria. The assessment by the external raters also shows that they are able to rate more differentiated in comparison to the assessment by the interview participants. This may be supported by the fact that the external raters are not directly part of the interview system and not subject to its social influences.

For conducting the Idiographic System Modeling there is a rather uniform development for all members of the sample. The assessment by the interview participants basically shows no difference, the external raters observe a few significant subgroup differences for which D8 participants receive higher ratings. Between D7 and the rest of the sample, there are no meaningful deviations. All members start from a comparable initial position and follow a quite uniform

development throughout the training. For this procedure the different experience levels do not have an impact in learning and performing. Similar to the knowledge test, this can be explained by the type of experience the participants of D7 and D8 have compared to TU participants. The Idiographic System Modeling requires cybernetic thinking by constructing networks of a client's constructs. The systemic training institution does not explicitly support cybernetic thinking in favor of a very strong focus on solution-oriented counseling. Although the participants of D7 and D8 have more experience in counseling and systemic approaches, they are unfamiliar with cybernetic thinking and can not make use of their experience in the Idiographic System Modeling.

A more pronounced difference between the subgroups is shown in the graphical system models. There is a general improvement of the models across the measurements, reflected in the increase of the occurrences and the level of the ratings. For the first two measurements, TU participants receive better results in the models, but this finding is inverted at III. At the last measurement, D8 participants show better results. Not only do more subgroup differences show in the graphical models but also the trend is reversed. The participants of D8 obviously needed more time to learn the formalisms of graphical system models and had initially quite a different conception of what a system model comprises, as many models show at I. They often served as a mere information collection - loosely connected entities. As mentioned before, cybernetic thinking is not enforced in D8's training. Throughout the training, D8 participants profited more from the training since they compiled the better models at III. Also, some of the TU interviews were conducted with a considerable lag of some months after the end of the training. This may have led to disregarding the principles of graphical system models and the advance of TU was lost.

Although, a pre-post comparison across all items shows a significant development, the rating levels of the occurred items are quite stable. This may be because of the ordinal rating scale with three answer options that does not allow much variance. A rating scale with more answer options could produce more variance and, thus, clearer differences.

Although, the most important criteria for graphical system models have sufficient occurrences and ratings, dynamical aspects are underrepresented (closed feedback loops, recursively netted submodels), and thus process dynamics can not be reproduced in most models. Thinking in temporal dimensions seems challenging. Being able to adequately represent a system's dynamics can be considered as a second order ability, which can only be applied when the basics of the Idiographic System Modeling are mastered (elements, relations, dependencies, description of relations). Most participants managed this first step but could not concentrate on integrating dynamical aspects.

The complete absence of any cybernetic criteria in all system models is surprising. They were not expected at I or II, since they were taught only in the second training round. Still, there is no single incidence at III. The Idiographic System Modeling with its four steps is a quite complex procedure. Highly likely, beginners are so concerned with the identification of elements and

their interrelations and compiling a meaningful model that the cybernetic criteria are forgotten. In addition, the cybernetic criteria may seem too abstract and irrelevant for the system model that the counselors do not integrate them on purpose as they do not see a surplus in adding them.

It also shows in the results that the most improvement is captured on items that are closely connected to specified instructions what to do in the counseling process (e.g. closed feedback loops, description of relations). Items that are more vague in their description (e.g. precise actions derivable, solution and resource orientation) capture less improvement. This indicates that in adult education it is important not to overstack the training with too much input if a development is to be recorded. The more precise the rating category is phrased and the easier it is to act out the respective behavior the more likely a development is captured.

The assessments of the interview participants, the external raters, and the system models show an improvement. They differ with respect to the degree of the competence development. Counselors do not report any improvement, and only a minimal improvement is perceived by clients and observers. A more differentiated picture is given by external raters. They observe a more pronounced competence development with more subgroup differences that show higher ratings for D8 participants. This advance is supported by the initial experience level which is higher for D8 and shows throughout the training. It is concluded that competence development can be better perceived when it is assessed by others than the competence holders themselves.

For DIDSYM, there is one point of criticism: Thinking in dynamical patterns that can reproduce cognitive, emotional or behavioral patterns needs to be promoted further. The majority of the graphical system models do not show the degree of complexity and connectedness needed to reproduce them. A stronger focus on this aspect - one goal of Idiographic System Modeling - during the training is required in order to achieve a higher degree of interconnectedness. The benefit of dynamic patterns in system models has to be pointed out in order to be considered by training participants.

9.2.3 Generic Principles

For the Generic Principles, the assessments by the interview participants show a trend of stable ratings across the measurements with D8 participants reporting higher ratings. The interview transcriptions into graphical process models result in differing interview types which are differently distributed across measurements and subgroups.

Like for DIDSYM, the ratings by the interview participants are on a quite high level from the first measurement on. But whereas clients and counselors state an improvement of the counseling behavior for DIDSYM, none of the three perspectives shows any significant development. The higher ratings of D8 participants in some items show a higher competence perception in

contrast to TU participants. The data suggest, that either no competence development happened in these interviews, no improvement was perceived, or the rating scales are non satisfying.

It is highly likely that the same influences come into effect as they are discussed for DIDSYM. The social situation and the resulting well-meaning feedback culture take hold and establish very stable perception of the counseling behavior across the measurements. An additional third impact factor shall be discussed at this point. Although it is thought to be effective for the Idiographic System Modeling as well, its impact is considered stronger for DUGEP as the interviews have a less technical and procedural character: The adaption of the intra-individual criteria for completion or non-completion of items. Against the background of the stable ratings for all perspectives it is suspected that the pretensions of the participants toward the counseling process and the counselor adapt with more experience and knowledge. Thus, the rising performance of the counselors does not show in the judgment (item rating) since the pretension for complying with the item is raised at the same time. The final judgment is also subject to an error term. The following formula depicts this relation.

$$competence\,judgment = \frac{\text{perceived performance}}{\text{pretension toward performance}} + \varepsilon$$

If the pretension toward the performance increases in the same way as the competence develops there is no obvious development showing in the ratings. This principle is thought to take effect with both interview procedures but to a higher degree for DUGEP. This is due to the more abstract character of the items. The more abstract, the more room there is for interpretation filled by the individuals. The more concrete character of the DIDSYM items seem to inhibit the leveling effect to some degree.

In combination with the overlapping meanings of some DUGEP items, this effect is considered to inhibit the replication of the structure of the Generic Principles. The Generic Principles are not meant to be factors in sensu a factor analysis. As the graphical models show they occur in different combinations and intensities. As they are intended to be a guideline for the selection of context-appropriate techniques in a counseling process, the initiated techniques can not even exclusively be allocated to one Generic Principle. Thus, the Generic Principles are in no way factors in the statistical sense.

The onset and intensities of the Generic Principles have a high face validity, recalling that all interviews are meant to be initial interviews. This explains the fewer occurrences and lower intensities of Generic Principles VII and VIII. Generic Principle I and VI form the foundation of the counseling competences, their implementation is crucial for the further frequent and intensive implementation of other Generic Principles. An implementation of Generic Principle I and VI is necessary, but not sufficient for an interview with high intensities. Members of both subgroups show the basic ability to implement them in a satisfactorily manner. But, furthermore,

D8 participants are able to achieve higher intensities in Generic Principle IV and V. This reflects the experience they have over TU participants.

The most prominent characteristic in the graphical process models is high covariation of Generic Principle I and VI. It is assumed that the aspects of providing conditions of stability and counseling in a synchronic manner result in very similar behavior which is difficult to discriminate. The ratings of Generic Principle III are the ones with the least plausibility. It shows in the three different ways this principle was coded in correlation with other principles. As well, the external raters reported about the difficulty to observe it.

The quality of a counseling interview does not necessarily depend on the number of the implemented Generic Principles. Therefore, the quantity of the Generic Principles can not serve as an indicator for the improvement of the counseling behavior. Instead, the fit between counselors' intentions and the clients' reactions serves as one indicator. The good fit in most of the interviews shows that the counselors are able to adapt easily to the client's receptiveness and the clients are able to follow the counselors' guidance. The participants of D8 had known each other for a while with a very trusting atmosphere, as well, there was a very colloquial atmosphere among the university students. The group climates are thought to explain this good fit between the counselors and the clients.

Another indicator for the quality are the interview types. The graphical interview representations reveal different interview types that are connected to the measurements. There is a tendency for a decrease of the hole-block type and the stripe-block type interview from I to III and an increase of the hole type. If the "holes" characteristics is interpreted as a counselor's ability to flexibly implement, then a slight improvement can be stated, although there is no meaningful statistical trend. This also shows when looking at the subgroup differences. D8 implements more of the basic interview types (especially the hole- and block-type) whereas TU participants implement more combination types. This indicates D8's competence to initiate many Generic Principles at the same time or rather the competence to flexibly respond to the clients' needs. This flexible counseling behavior creates the characteristic "holes"; represented by blanks in the interviews process or varying intensities.

This represents the intention of the Generic Principles: to select techniques and methods in a flexible manner according to the client's current state and needs.

The assessments of the interview participants do not show an improvement whereas the graphical process representations show a slight shift to more "hole" characteristics. This is interpreted as an improvement with respect to the flexible, demand-oriented implementation of the Generic Principles. Comparing the findings of the assessments in DUGEP with the findings in DIDSYM in which the counselors do not perceive an improvement but the clients and the observers do, the question arises how adequate such assessments for competence development are. It is thought they are strongly influenced by the social situations and that the perception of stable charac-

teristics overshadows the observation of the improving counseling behavior. The more abstract character of the DUGEP items leave more room for individual interpretation, thus, the leveling effect is stronger than for DIDSYM interviews.

For the implementation of the Generic Principles the detailed analysis of the implementation - intention and reaction - is considered very useful. For training purposes, this procedure has to be considered too time-consuming. Implementing such a procedure in a training curriculum seems unrealistic. This examination may remain reserved for research purposes.

For DUGEP, there are three points of criticism:

Even though the Generic Principles are not meant to be factors in the statistical sense, the wording of the items has to be revised in order to receive a better discrimination between the meanings of single items. This may help in emphasizing the core meanings of each Generic Principle. As well, with a bigger sample of subjects this may reproduce the intended stable factor solutions. Second, to generate the graphical interview representations a lot of manpower is needed. This diminishes the utility of this procedure for practical applications to a high degree. The insights it gains is primarily for scientific purposes. Third, there is no single indicator for the coded DUGEP interviews and the analysis is conducted with a qualitative approach. In order to achieve a better comparability of the interviews one indicator is needed.

9.3 Concluding Examination of Thesis

This thesis aims to make a contribution for the operationalization of the construct systems competence. By transforming three facets into a training, accompanied by tailored evaluation instruments, the successful operationalization is demonstrated. The evaluation instruments allow the microscopical analysis of the respective counseling behavior and knowledge gain. Also, they are able to display development and differences between experience levels.

The three evaluation instruments reveal differences in the counseling behavior according to the experience level of the counselors. As an overall pattern in the interviews, it shows that D8 as the subgroup with more relevant previous knowledge and skills receives better ratings than TU participants. But: statistically these effects are not very strong.

It shows that the operationalization of the Idiographc System Modeling and the Generic Principles through conducting interviews and rating the process on several scales from different perspectives serves as a support for reflection on the interview process. Conducting this kind the evaluation without the external rater seems feasible and economical. The learning process of training participants is enhanced by providing the rating scales as a guideline for internal feedback. The self-assessments are important in competence development; less for capturing "objective" competence levels, but for being a means of reflection of one's own counseling behavior. In combination with the assessment of others, differing values in the assessments offer

a multitude of reflection possibilities. In this sense, the evaluation instruments can be used as a means for guided reflection about the interviews.

For monitoring the development of counseling competences and teaching purposes it is considered helpful to abstain from describing competence levels but to use competence profiles. Feedback in learning situations profits from detailed information about strengths and weaknesses. The abstraction by summarizing different items into one descriptive measure would result in the loss of information that is needed for further improvement. For designing trainings for adults and teaching purposes, it has to be questions of competences are the appropriate abstraction level to use. Competence are highly abstract construct which have to be broken down in the respective constituents which are abilities, skills, knowledge etc. At this microscopical level it is possible to word understandable instructions, give appropriate feedback in observational entities, correct behavior, and comprehend and reflect one's own mindset and strategies. For this purpose, the items of the evaluation instruments are considered very valuable.

Evaluation instruments can be developed upon this pattern for different aspects of the constructs systems competence. Yet, it has to be advised that the commitment of participants in adult education classes must not be overstressed. If all aspects of systems competence are evaluated in such detail as presented, the participants' motivation is thought to decrease. System competence is very elaborate, and so far only three aspects are operationalized. Although, the microscopical approach is considered appropriate other means of evaluating systems competence have to be applied in order to rate systems competence on a higher level.

Lastly, the construct systems competence can be rearranged in a way that the dimensions suit the established categorization. It now comprises key competences with a superordinate metacompetence that provides decision criteria for the selection of single competences. With this rearrangement of the construct, systems competence can be considered as a competence model.

The training is designed for courses of systemic counseling. As such, it is applied in adult education. The participants are restricted with respect to time they can invest in the preparation and revision of the training content as they have jobs, families etc. As long, as the training is not part of a university curriculum, this holds true for university students as well, as the training is an add-on to the core curriculum. These constraints have to be taken into consideration for successful implementation. Throughout the training, the participants acquire inter alia questioning methods, interview schemes, basic counseling attitudes. This helps the counselors to establish a trustworthy relationship with their clients, follow certain schemes and pose appropriate questions - basic constituents for a counseling interview. Besides these building blocks, step-by-step schemata are introduced in the training that serve as a guideline for interviews. For Idiographic System Modeling these steps are more defined than for the Generic Principles.

Experiential learning is one major asset in the training concept; the topic itself provides high practical relevance. Varying teaching methods are implemented in order to keep up the partici-

pants' motivation and attention. The overall evaluation shows an increase in competence. The training concept supports self-organized learning with one exception: conducive learning environments could not be provided. The spatial conditions of the seminars did not allow storing further material. Thus, this aspect of self-organized learning was not supported as originally intended.

Nevertheless, the training has to be considered as very challenging since the content is very multifaceted and conducting interviews is a highly complex task - even for experienced counselors. The training units are thought to have a higher impact if they were included into a more comprehensive counseling training. By doing so, basic skills and attitudes - even complete counseling models - can be trained before introducing Idiographic System Modeling or the Generic Principles. Teaching both methods at a later point in time of an ongoing counseling training, will benefit participants from a greater variety of basic skills and abilities counselors can choose from in the interview. The incorporation of the training into a more comprehensive counseling course will also give more time to develop the necessary competences.

At this point, it is concluded that the assessment of the competence development by interview participants is highly valuable in learning contexts since DIDSYM and DUGEP provide manifold opportunities to discuss counseling behavior from different perspectives. For both, there are differing findings with respect to the question, which method is more adequate to capture the competence gain of the counselors. As it shows, the self-assessment of the counselors does not indicate any development, although the other data sources always suggest a competence gain. For the DUGEP interviews, none of the perspectives report any development. But, there are hints that suggest an improvement towards a more flexible interview style. For the evaluation of competence development, this raises the question, if self-assessments - or even assessments by very close participants - are valid in order to portray a development. The social situation, sense of community, and adapting pretension levels have been discussed as possible influences that inhibit a more objective competence assessment. It seems that with growing distance to the subject of assessment (counselor) a development can be observed, that assessed individuals, however, are not able to perceive. The own counseling behavior is perceived stable, even across a span of several months and considerable training.

The evaluation instruments are built upon the established practices of the systemic community. For evaluating the actual competence development, a more objective measure is suggested. These more objective measures as they are applied in this thesis involve a lot of effort by trainers, and thus, it is doubtful that they would be used in systemic institutions. Especially, the video-coding may remain a procedure which is only viable to this extent in research.

For counseling trainings in adult education this calls for establishing two different feedback mechanisms. First, internal feedback from the interview participants by means of rating scales. Second, feedback by persons who are not directly involved in the training class who assess the counseling behavior applying coding catalogs and descriptions of relevant behavior. This can be

a person from a different peer group, course, or a trainer who is not directly involved with the class.

Since the D8 participants had more previous experience and the training of this thesis was embedded in their regular systemic training, a steeper learning gradient for the two interview procedures could have been expected even if the initial positions were the same as for TU. As the development for both subgroups does not differ considerably from each other in their results, the special composition of the members of D8 has to be taken into consideration. Beyond the characterization of the sample (see table 7.1 on page 125) the characteristics of the systemic training institution have to be considered as well. As it is not a member of the professional organization SG or DGSF, the requirements for successful completion of the training differ. The total number of hours is less, and there are less restrictions for admittance approval. The institution advertises its classes with a high degree of exercises and training interviews. There is little theoretical and conceptual input. All these factors taken together, the systemic institution offers a low threshold training that may appeal to a certain target group. The training institution may attract participants who look for hands-on help for the daily work, few intellectual challenges, room for self-development, and a cordial atmosphere. Thus, the sample of the systemic training institution improves over time but does not considerably outperform TU participants.

9.4 Future Work

The results raise a number of questions that affect subsequent research activities. They cover methodological questions in the procedure of capturing competence gain in systemic trainings and the search for validation criteria to assess the competence level of participants in such trainings.

Five topics are covered in the following: further evaluation procedures for evaluating systems competence, parallel knowledge tests, revision of rating scales, interview types, time series, and validation with practicing counselors.

Further Evaluation Procedures for Evaluating Systems Competence. The findings of this thesis provide some insights into the appropriateness of the competence assessment from different perspectives. The occurring differences raise the question what procedure is adequate for measuring the competence level. In spite of the various applied evaluation procedures, they all applied rating scales. Further possible approaches for evaluating systems competence are system role play and computer scenarios, which both have a strong connection to the construct itself.

System role play offers a life scenario in interaction with others (see section 2.2.4). It requires an individual to act as part of a multi-system constellation. The influences onto the individual are even less predictable compared to an interview situation. As specific roles are adopted with given

characteristics and tasks which involve the interaction with others, the personal involvement is assumed to be higher than during an interview. Thus, the system role play is an excellent setting for evaluating the personal and social-communicative competences of an individual.

Computer simulations prove very useful for the evaluation of dealing with complex, intransparent scenarios (see section 2.2.4). From the evaluator's point of view, this procedure allows a very good control of the influencing variables and implemented challenges. Despite the artificial situation it allows focusing on single components of systems competence. The basic understanding of the functioning of complex, intransparent systems can be very well evaluated.

Size of Sample. The comparison to the third competence level of D7 is very difficult due to the insufficient data. There are only 2 interviews for DIDSYM and DUGEP each. For the two counselors it has to be stated that the quality of the interviews does not represent the competence level that D7 participants should have had according to their experience. Thus, there is no true third competence level. The size of the random sample is large enough for most statistical procedures but yet small. The explanatory power of the statistics can be increased considerably by enlarging the size of the sample.

Parallel Knowledge Tests. For WIGSY, parallel knowledge tests have to be developed in order to exclude learning effects that come from the same evaluation materials. During the development, it showed that the compilation of item sets for each of the multiple choice questions proved difficult. The pretests showed that most of the items were very easily detected as right or wrong, even by probands who were unfamiliar with the contents. To master this challenge, for each subsection of the knowledge test, several questions with different difficulties have to be developed. This results in a universe of different items with varying complexity (open questions, multiple-choice questions, sketches, classification etc.). The comparability of the items has to be validated in pretests before using them.

Revision of Rating Scales. There were extensive coding catalogs and instructions for observing the respective counseling behavior. The developed material offers multiple opportunities for detailed and guided reflection of rehearsal interviews. The assessment from three different perspectives provides possibilities to discuss observed counseling behavior and different perceptions. This is especially crucial in training settings in which reflection is a major factor for improvement. But, the wording and the answer schema of the items have to be revised in order to guarantee that they ask the intended meaning. A more detailed description of each answer option with respect to observable behavior is thought to result in interpretable factors, especially for DUGEP. Also, the answer scale may not be adequate to create enough variance between the items and / or the participants.

Interview Types. The analysis of the DUGEP interviews revealed six different interview types (see section 8.3.3). It remains unclear if there are specific interview types for different

competence levels. The data basis of this thesis only allows a rough categorization. A broader data basis with more transcribed DUGEP interviews can help in finding more distinct categories or even new categories. This can lead to a better understanding of the functioning of the Generic Principles and may even reveal dependencies and interaction between the Generic Principles.

Time Series. In this thesis, the evaluation design followed a classical pre-post comparison with one additional intermediate evaluation in the middle of the training (see page 7.3.2). Developing competences requires time. The total of 24 hours for the full training is considerable but not abundant for such abstract and complex procedures as the Idiographic System Modeling or the concept of the Generic Principles. More time may be needed to reach a higher level of proficiency. With more frequent evaluations, time series can be modeled allowing a more detailed interpretation of an individual's development and competence dynamics. This will reveal the flexibility or stability of the different assessment types more clearly than it is possible with three measurements.

Validation with Practicing Counselors. The evaluation instruments are meant for describing the competence gain throughout the training in a systemic training institution. For this reason, practicing counselors were not considered in the random sample. They are thought to hold the necessary competences for successful counseling. Their competent behavior can shed a different light on characteristics which may only show in competent counseling behavior that can not be observed from the available data of this thesis.

Since DUGEP evaluates the Generic Principles, any therapeutic or counseling interview can be used to rate their implementation. The Generic Principles are not specific for systemic or solution focused brief therapy, but serve as a general guideline for implementing universal principles for allowing change. Thus, counseling interviews following different therapeutic schools can be examined with respect to the implementation of those principles, which may lead to a closer look at the differences or similarities between them.

To evaluate Synergetical knowledge with practicing counselors, counselors with Synergetical background are needed. DIDSYM requires an interview that follows the Idiographic System Modeling. Both are quite specific and probably not well-known - even in the systemic counseling community. This restricts the group of potential counselors who could be invited to participate in a comparative study.

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A

Knowledge about Synergetics

A.1 WIGSY - Wissenstest zu den Grundlagen der Synergetik

WIGSY

Der Wissenstest zu den Grundlagen der Synergetik (WIGSY) erhebt Ihre Kenntnisse zu den Grundbegriffen und Konzepten auf diesem Gebiet.
Sie werden in diesem Bogen auf zwei Fragetypen treffen:

1. Offene Fragen: Antworten Sie so ausführlich wie nötig und so knapp wie möglich. Die Beantwortung in knappen Sätzen reicht bei diesen Fragen aus.
2. Multiple-Choice-Fragen: Kreuzen Sie die zutreffende(n) Antworte(n) an.

Ihre Daten werden vertraulich behandelt. Die Auswertung des Bogens erfolgt in anonymisierter Form.

Bevor Sie beginnen, tragen Sie bitte zuerst Ihren persönlichen Code ein. Benutzen Sie dabei stets den gleichen Code. Die Zusammenstellung lautet:
Die ersten beiden Buchstaben des Vornamens der Mutter: z.B. **Christine**
Die ersten beiden Buchstaben des Vornamens des Vaters: z.B. **Fritz**
Das zweistellige Geburtsjahr der Mutter: z.B. 1946
　　Daraus folgt der Code: *z.B. ChFr 46*

Ihr persönliche Code: ＿＿ ＿＿ ＿＿

Bitte tragen Sie zuallererst Ihren persönlichen Code auf jeder der folgenden Seiten ein, bevor Sie mit der Beantwortung der Fragen beginnen.

Viel Erfolg!

Code: ＿ ＿ ＿ ＿ ＿ ＿

1. Definieren Sie den Begriff *System*. Erläutern Sie die Definition an einem Beispiel und fertigen Sie eine kleine Skizze davon an.

2. Geben Sie - in Abgrenzung zu dem oben genannten Beispiel eines Systems - ein Beispiel für ein *Nicht-System*.

3. Was bedeutet der Begriff *Äquifinalität* und warum ist er so bedeutend für die systemische Beratung?

WIGSY – Wissenstest zu den Grundlagen der Synergetik　　　　　　　2

Code: _____

6. Beschreiben Sie kurz die Methode der idiographischen Systemmodellierung und welchen Nutzen sie im Rahmen einer Beratung leisten kann.

7. Welche Kriterien werden angewandt, um bei einer Systembeschreibung in Organisationen die Systemgrenzen festzulegen? Kreuzen Sie die richtige Kombination der Möglichkeiten an.

☐ Beschreibung auf einer Ebene *oder*
☐ Beschreibung auf mehreren Ebenen

☐ Betrachtung aus einer Perspektive *oder*
☐ Betrachtung aus multiplen Perspektiven

☐ Orientierung an natürlichen, sozialen Einheiten *oder*
☐ Orientierung an zu definierenden Einheiten

8. Was sind emergente Eigenschaften? Kreuzen Sie die richtige Antwort an.

☐ Neue Qualitäten/Eigenschaften eines Systems, die erst durch das Zusammenwirken der Systemelemente zustande kommen
☐ Spezifische Qualitäten/Eigenschaften, die Berater im Verlauf einer Beratung zeigen
☐ Neue Qualitäten/Eigenschaften eines Systems, die erst durch Ressourcenaktivierung zustande kommen
☐ Qualitäten/Eigenschaften, die ein Klient im Verlauf einer Beratung erwirbt

9. Was versteht man unter Hysterese? Kreuzen Sie die richtige Antwort an

☐ Beibehalten des Systemzustandes bei Änderung der Randbedingungen und Parameter
☐ Veränderung des Systemzustandes bei Änderung der Randbedingungen und Parameter
☐ Veränderung des Systemzustands bei stabilen Randbedingungen und Parameter
☐ Beibehalten des Systemzustands bei stabilen Randbedingungen und Parametern

WIGSY – Wissenstest zu den Grundlagen der Synergetik   4

Code: _____

3. Welche Aussage(n) sind mit dem Prinzip der *Ressourcenorientierung* vereinbar? Kreuzen Sie die betreffende(n) Aussage(n) an, Mehrfachantworten sind möglich.

☐ Klienten bringen alle Ressourcen mit, die sie zur Lösung ihres Problems brauchen.
☐ Die Beratung dient den Klienten zur Identifikation derjenigen Ressourcen, die sie sich aneignen müssen, um ihre Probleme zu lösen.
☐ Als Ressource gilt alles, was den Klienten beim Erreichen ihrer Wünsche hilft.
☐ Klienten brauchen keine Hilfe bei der Identifikation ihrer Ressourcen.
☐ Der Begriff Ressource bezeichnet alleinig die Fertigkeiten und Fähigkeiten von Klienten.

4. Welche Aussage(n) sind mit dem Prinzip der *Kundenorientierung* vereinbar? Kreuzen Sie die betreffende(n) Aussage(n) an, Mehrfachantworten sind möglich.

☐ Berater erfragen die Probleme der Klienten und entscheiden danach, woran zuerst gearbeitet wird.
☐ Berater bieten ihren Klienten (Kunden) genau das, was sie subjektiv wollen.
☐ Den Klienten wird nicht gesagt, was sie nach Meinung von Experten benötigen.
☐ Bei mehreren Klienten ist es wichtig herauszufinden, was jeder einzelne Kunde möchte.

5. Welche Aussage(n) sind mit dem Prinzip der *Lösungsorientierung* vereinbar? Kreuzen Sie die betreffende(n) Aussage(n) an, Mehrfachantworten sind möglich.

☐ Die Probleme der Klienten müssen zunächst gründlich verstanden werden, bevor eine Lösung erarbeitet wird.
☐ Die Beratung fokussiert sich nicht auf Entstehung von Problemen.
☐ Die Beratung konzentriert sich auf die Erarbeitung von alternativen Denk- und Wahrnehmungsmustern.
☐ Die Klienten können aus einer Reihe von Lösungsmöglichkeiten, die der Berater anbietet, eine auswählen.
☐ Der Berater gibt den Klienten die Lösung mit auf den Weg, die er aufgrund seiner Ausbildung und Erfahrung empfiehlt.

WIGSY – Wissenstest zu den Grundlagen der Synergetik   3

Code: _ _ _ _ _ _ _

10. Geben Sie dazu ein Beispiel für Hysterese an.

11. Zählen sie die Generischen Prinzipien auf.

12. Wozu dienen die Generischen Prinzipien?

13. Welche drei Bedingungen müssen gegeben sein, damit sich ein System selbst organisieren kann? Kreuzen Sie genau diese drei Bedingungen an.

- ☐ Große Zahl von Elementen
- ☐ Lebendes System
- ☐ Dissipative Struktur
- ☐ Leidensdruck
- ☐ Zeit
- ☐ Nichtlinearität

14. Beschreiben Sie, was ein Phasenübergang ist.

Code: _ _ _ _ _ _ _

15. Welche Arten von Phasenübergängen kennen Sie? Beschreiben Sie diese knapp.

16. Bei Phasenübergängen treten so genannte „Kritische Fluktuationen" auf. Was genau geschieht dabei?

17. Was ist ein Kontrollparameter?
Kreuzen Sie die betreffende(n) Aussage(n) an, Mehrfachantworten sind möglich.

- ☐ Ein Kontrollparameter beschreibt die Einwirkung der Umwelt auf ein System.
- ☐ Ein Kontrollparameter kontrolliert die Elemente eines Systems.
- ☐ Kleine quantitative Veränderungen an einem Kontrollparameter können zu qualitativen Veränderungen des Systemverhaltens führen.
- ☐ Das Verhalten eines Systems ist proportional zu den quantitativen Veränderungen eines Kontrollparameters.
- ☐ Kontrollparameter kontrollieren die Umwelt eines Systems.

18. Was sind Ordnungsparameter?
Kreuzen Sie die betreffende(n) Aussage(n) an. Mehrfachantworten sind möglich.

- ☐ Ordnungsparameter sind dominante Muster, die verhaltensbestimmend wirken.
- ☐ Ordnungsparameter werden durch Kontrollparameter versklavt.
- ☐ Ordnungsparameter versklaven Systemteile.
- ☐ Ordnungsparameter bestimmen alleine das Systemverhalten.
- ☐ Ordnungsparameter ordnen die Systemumwelt.

Code: ___ ___ ___ ___ ___

19. Ordnen Sie zu, wer wen beim Versklavungsprinzip „versklavt" und verbinden Sie die entsprechenden Begriffe mit einer Linie.

versklaven

Kontrollparameter   Ordnungsparameter
Ordnungsparameter   Systemelemente
Systemelemente   Kontrollparameter

20. Wie hängen Kontrollparameter, Ordnungsparameter und einzelne Systemelemente zusammen? Erklären Sie die Zusammenhänge anhand einer Skizze.

WIGSY – Wissenstest zu den Grundlagen der Synergetik

7

WIGSY - Wissenstest zu den Grundlagen der Synergetik (4)

B

Appendix

Idiographic System Modeling

B.1 DIDSYM - Dokumentationsbogen zur Idiographischen Systemmmodellierung

B.2 Evaluationsbogen zur Idiographischen Systemmmodellierung

B.3 Bewertung der Systemmodelle

DIDSYM

Dokumentationsbogen zur idiographischen Systemmodellierung

Der Dokumentationsbogen zur Idiographischen Systemmodellierung (DIDSYM) unterstützt systemische Berater bei der Arbeit mit ihren Klienten, indem er Rating-Skalen bereitstellt, die den Rekonstruktionsprozess eines relevanten Systems von Klienten bewerten. Die Systemmodellierung wird auf Video aufgenommen und ermöglicht Feedback zum Verlauf der Modellierung. DIDSYM ist auf Beratungsgespräche im Einzelpersonensetting mit Beobachtern ausgelegt, eignet sich aber auch für die Durchführung im Mehrpersonensetting.

Die Daten, die Sie in diesem Dokumentationsbogen angeben, werden vertraulich behandelt. Die Auswertung des Bogens erfolgt in anonymisierter Form.

Bevor Sie beginnen, tragen Sie bitte zuerst Ihren persönlichen Code ein. Die Zusammenstellung lautet:
Die ersten beiden Buchstaben des Vornamens der Mutter: z.B. Christl
Die ersten beiden Buchstaben des Vornamens des Vaters: z.B. Franz
Das zweistellige Geburtsjahr der Mutter: z.B. 1946
    Daraus folgt der Code: z.B. ChFr 46

> *Ihr persönlicher Code:*   _ _ _ _ _

Bitte tragen Sie zuallererst Ihren persönlichen Code auf jeder der folgenden Seiten ein. Vergessen Sie auch nicht, Ihren Code auf den Rating-Skalen der Klienten und der Beobachter einzutragen.

Viel Erfolg!

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Code: _ _ _ _

Methode der Systemmodellierung

Bei jeder Beratung steht ein systemischer Berater vor der Aufgabe, das für die Beratung relevante System der Klienten kennen zu lernen und die Prozesse dieses Systems zu verstehen. Die Methode der Systemmodellierung unterstützt den Berater bei dieser Aufgabe.

Die Systemmodellierung ist eine Methode, die zu einem frühen Zeitpunkt in einem Beratungsprozess die Funktionsweise eines komplexen Systems erfasst. Dabei werden Systeme als **vernetzte Prozesse** beschrieben. Von der Ebene des Materiellen (Menschen, Gebäude, etc.) wird abstrahiert und stattdessen werden die **Beziehungen zwischen Elementen** dargestellt, die für die **Funktionsweise** des Systems Bedeutung haben. Diese Elemente sollten kontinuierlich mehr oder weniger vorhanden sein.

Ein Beispiel: Eine Schule wird man nicht dadurch modellieren, dass man z.B. jeden einzelnen Schüler individuell modelliert, sondern indem man Klassen, Leistungsniveau, Geräuschpegel, Motivation, usw. miteinander in Beziehung setzt.
Ein weiteres Beispiel: In Organisationen lassen sich einzelne Verhaltens- und Erlebnisweisen zu Aspekten wie Führungskompetenz, Arbeitszufriedenheit und Einstellungen zusammenfassen und darstellen, wie sie aufeinander einwirken.

Einfach gesprochen wird in einem Systemmodell dargestellt, **was** *(welche Elemente)* **was** *(andere Elemente)* **wie** beeinflusst *(über welche Beziehungen)*.
Etwas komplizierter ausgedrückt: In einem Systemmodell werden intrapsychische Prozesse des Verhaltens und des Erlebens und deren gegenseitige Vernetzung abgebildet.

Das **Ziel der Systemmodellierung** besteht darin, gemeinsam mit dem Klienten herauszufinden, welches System in der Beratung behandelt werden soll und wie es aussieht, d.h. welche Elemente dazugehören und welche Beziehungen zwischen diesen herrschen. Dabei ist es zunächst irrelevant, ob es sich um ein Lösungssystem oder ein Problemsystem handelt.
Bei der **Methode der Systemmodellierung** erkundigt sich der Berater zunächst, worüber der Klient sprechen möchte, bevor er durch Fragen das relevante System erkundet und Elemente und deren Beziehungen detailliert erfragt. Gemeinsam mit dem Klienten erstellt der Berater dann ein **graphisches Modell** (Zeichnung), welches das Systemmodell (Elemente und deren Beziehungen) visualisiert. Im Anschluss daran überlegen Berater und Klient gemeinsam, welche **Konsequenzen** oder Interventionen sich aus dem Systemmodell ergeben.

Zur Erstellung des graphischen Models kann eine Tafel, Flip-Chart oder ähnliches verwendet werden.
Nehmen Sie sich für die Systemmodellierung **Zeit**. Es ist ein wichtiger Schritt für das Verständnis des Klienten und für die weitere Zusammenarbeit.

Dokumentationsbogen DIDSYM

Der Dokumentationsbogen DIDSYM und die Videoaufnahme unterstützen den systemischen Berater bei der Anwendung der Systemmodellierung auf zwei Arten:
1. **Video-Feedback** durch Aufnahme des vollständigen Beratungsprozesses der Systemmodellierung
2. **Teilnehmer-Feedback** durch Rating-Skalen zur Einschätzung des Modellierungsprozesses nach der Beratung

DIDSYM - Dokumentationsbogen zur idiographischen Systemmodellierung   2

Code: __ __ __ __ __ __

Anwendung von DIDSYM:

Der Berater ist für die Anwendung des Dokumentationsbogens verantwortlich.
Bei der Arbeit mit dem Dokumentationsbogen DIDSYM gehen Sie als Berater folgendermaßen vor:

1. Bereiten Sie das Beratungssetting vor.
2. Bereiten Sie die Videokamera für die Aufnahme vor. Achten Sie auf ausreichende Beleuchtung.
3. Füllen Sie die Eckdaten des Dokumentationsbogens aus (S. 4).
4. Führen Sie mit Ihrem Klienten ein Gespräch, in dem Sie eine Systemmodellierung durchführen. Nehmen Sie dieses Beratungsgespräch auf Video auf.
5. Vervollständigen Sie die Eckdaten (Gesprächsende und –dauer) des Dokumentationsbogens (S. 4).
6. Verteilen Sie die Rating-Skala für Klienten (S. 8) an den Klienten und die Rating-Skala für Beobachter (S. 9) an den Beobachter. Haben mehrere Beobachter die Beratung verfolgt, so einigen sich die Beobachter auf eine Einschätzung und geben gemeinsam einen Bogen ab.
7. Das Ausfüllen der Rating-Skalen durch Berater, Klient und Beobachter erfolgt unabhängig voneinander.
8. Füllen Sie selbst die Rating-Skala für Berater aus (S. 7).
9. Sammeln Sie die Rating-Skalen ein. Bei Bedarf können Sie sich mit den Klienten und Beobachtern über deren Einschätzungen austauschen.
10. Vervollständigen Sie den Dokumentationsbogen, in dem Sie auf Seite 5 kurz die Ausgangslage, welche die Ausgangslage für die Beratung bildete, beschreiben.
11. Übertragen Sie auf Seite 6 die graphische Darstellung des Systemmodells, das Sie gemeinsam mit dem Klienten erstellt haben.
12. Führen Sie unten auf Seite 7 kurz auf, wie Sie nach dieser Beratungseinheit mit dem Klienten weiter arbeiten möchten.
13. Haben Sie alles dokumentiert, dann geben Sie den ausgefüllten Dokumentationsbogen und die Videoaufnahme zurück. Eine Kopie können Sie gerne behalten.

Code: __ __ __ __ __ __

Protokolldaten:

Gesprächsdatum : ___.___.20__

Gesprächsbeginn: _____ Uhr

Gesprächsende: _____ Uhr

Gesprächsdauer: _____ Minuten

Freiwillige Protokolldaten:

Wenn Sie möchten, können Sie für die spätere Nachvollziehbarkeit des Gesprächs die Namen der beteiligten Personen angeben. Sie können die Namen auch gerne anonymisieren oder einen Code (siehe Titelblatt) vergeben.

Berater: _____

Klient: _____

Beobachter 1: _____

Beobachter 2: _____

Beobachter 3: _____

Code: ___ ___ ___ ___

Systemmodell:

Übertragen Sie hierher das Systemmodell, welches Sie gemeinsam mit dem Klienten erstellt haben:

Code: ___ ___ ___ ___

Beschreibung der Ausgangslage:

Beschreiben Sie hier kurz die Ausgangslage, auf der die Systemmodellierung mit Ihrem Klienten aufbaut:

Code: __ — __ — __

Rating-Skala für Klienten:

Bitte füllen Sie die nachfolgende Rating-Skala nach Beendigung der Systemmodellierung aus. Bei den Antworten gibt es kein Richtig oder Falsch, es geht dabei um *Ihre* ganz persönliche Sicht.

Nr.		Stimme nicht zu	Stimme überwiegend nicht zu	weder noch	Stimme überwiegend zu	Stimme zu
1.	Ich habe jetzt einen besseren Überblick über meine Situation als vorher.	☐	☐	☐	☐	☐
2.	Das Gespräch hat mir meine Stärken bewusst gemacht.	☐	☐	☐	☐	☐
3.	Meine Formulierungen wurden während der Beratung aufgegriffen.	☐	☐	☐	☐	☐
4.	Mir fehlen keine Aspekte in dem beschriebenen System.	☐	☐	☐	☐	☐
5.	Das Gespräch hat mir nicht gut getan.	☐	☐	☐	☐	☐
6.	Das Aufzeichnen des Systems hat mir neue Einsichten gebracht.	☐	☐	☐	☐	☐
7.	Mir ist jetzt klarer, was ich will.	☐	☐	☐	☐	☐
8.	Ich weiß mir selbst zu helfen, wenn ich mich in einer schwierigen Situation befinde.	☐	☐	☐	☐	☐
9.	Ich weiß nun, woran ich als nächstes arbeiten möchte.	☐	☐	☐	☐	☐
10.	Ich fühlte mich während der Beratung verstanden.	☐	☐	☐	☐	☐
11.	Zusammenhänge in meinem Leben verstehe ich jetzt besser als vorher.	☐	☐	☐	☐	☐
12.	Ich sehe Möglichkeiten, die mir zuvor verborgen waren.	☐	☐	☐	☐	☐
13.	Die Beratung hat mir Sicherheit gegeben.	☐	☐	☐	☐	☐
14.	Der Berater hat in das, was ich ihm erzählt habe, nichts hinein interpretiert.	☐	☐	☐	☐	☐
15.	Die Beratung hat mich motiviert.	☐	☐	☐	☐	☐
16.	Das Aufzeichnen des Systems hat mich verwirrt.	☐	☐	☐	☐	☐

DIDSYM - Dokumentationsbogen zur idiographischen Systemmodellierung

8

Code: __ — __ — __

Rating-Skala für Berater:

Bitte füllen Sie die nachfolgende Rating-Skala nach Beendigung der Systemmodellierung aus. Bei den Antworten gibt es kein Richtig oder Falsch, es geht dabei um *Ihre* ganz persönliche Sicht.

Nr.		Stimme nicht zu	Stimme überwiegend nicht zu	weder noch	Stimme überwiegend zu	Stimme zu
1.	Der Klient hat jetzt einen besseren Überblick über seine Situation als vorher.	☐	☐	☐	☐	☐
2.	Das Gespräch hat dem Klienten seine Stärken bewusst gemacht.	☐	☐	☐	☐	☐
3.	Ich habe die Formulierungen des Klienten aufgegriffen.	☐	☐	☐	☐	☐
4.	In dem beschriebenen System fehlen keine Aspekte.	☐	☐	☐	☐	☐
5.	Das Gespräch hat dem Klienten nicht gut getan.	☐	☐	☐	☐	☐
6.	Das Aufzeichnen des Systems hat dem Klienten neue Einsichten gebracht.	☐	☐	☐	☐	☐
7.	Dem Klienten ist jetzt klarer, was er will.	☐	☐	☐	☐	☐
8.	Der Klient weiß sich selbst zu helfen, wenn er sich in einer schwierigen Situation befindet.	☐	☐	☐	☐	☐
9.	Der Klient weiß nun, woran er als nächstes arbeiten möchte.	☐	☐	☐	☐	☐
10.	Der Klient fühlte sich während der Beratung verstanden.	☐	☐	☐	☐	☐
11.	Der Klient versteht Zusammenhänge in seinem Leben besser als vorher.	☐	☐	☐	☐	☐
12.	Der Klient sieht Möglichkeiten, die ihm zuvor verborgen waren.	☐	☐	☐	☐	☐
13.	Die Beratung hat dem Klienten Sicherheit gegeben.	☐	☐	☐	☐	☐
14.	Ich habe keine eigenen Interpretationen vorgenommen.	☐	☐	☐	☐	☐
15.	Die Beratung hat den Klienten motiviert.	☐	☐	☐	☐	☐
16.	Das Aufzeichnen des Systems hat den Klienten verwirrt.	☐	☐	☐	☐	☐

Bitte beschreiben Sie kurz, wie Sie mit dem Klienten weiter arbeiten möchten:

DIDSYM - Dokumentationsbogen zur idiographischen Systemmodellierung

7

Code: ___ ___ ___ ___

Rating-Skala für Beobachter:

Bitte füllen Sie die nachfolgende Rating-Skala nach Beendigung der Systemmodellierung aus. Bei den Antworten gibt es kein Richtig oder Falsch, es geht dabei um *Ihre* ganz persönliche Sicht.

Nr.		Stimme nicht zu	Stimme überwiegend nicht zu	weder noch	Stimme überwiegend zu	Stimme zu
1.	Der Klient hat jetzt einen besseren Überblick über seine Situation als vorher.	☐	☐	☐	☐	☐
2.	Das Gespräch hat dem Klienten seine Stärken bewusst gemacht.	☐	☐	☐	☐	☐
3.	Der Berater hat die Formulierungen des Klienten aufgegriffen.	☐	☐	☐	☐	☐
4.	In dem beschriebenen System fehlen keine Aspekte.	☐	☐	☐	☐	☐
5.	Das Gespräch hat dem Klienten nicht gut getan.	☐	☐	☐	☐	☐
6.	Das Aufzeichnen des Systems hat dem Klienten neue Einsichten gebracht.	☐	☐	☐	☐	☐
7.	Dem Klienten ist jetzt klarer, was er will.	☐	☐	☐	☐	☐
8.	Der Klient weiß sich selbst zu helfen, wenn er sich in einer schwierigen Situation befindet.	☐	☐	☐	☐	☐
9.	Der Klient weiß nun, woran er als nächstes arbeiten möchte.	☐	☐	☐	☐	☐
10.	Der Klient fühlte sich während der Beratung verstanden.	☐	☐	☐	☐	☐
11.	Der Klient versteht Zusammenhänge in seinem Leben besser als vorher.	☐	☐	☐	☐	☐
12.	Der Klient sieht Möglichkeiten, die ihm zuvor verborgen waren.	☐	☐	☐	☐	☐
13.	Die Beratung hat dem Klienten Sicherheit gegeben.	☐	☐	☐	☐	☐
14.	Der Berater hat keine eigenen Interpretationen vorgenommen.	☐	☐	☐	☐	☐
15.	Die Beratung hat den Klienten motiviert.	☐	☐	☐	☐	☐
16.	Das Aufzeichnen des Systems hat den Klienten verwirrt.	☐	☐	☐	☐	☐

DIDSYM - Dokumentationsbogen zur idiographischen Systemmodellierung   9

DIDSYM - Dokumentationsbogen zur Idiographischen Systemmmodellierung (5)

Code: _ _ _ _ _ _ _ _   Evaluator(in): _____

Datum: _ _ / _ _ / _ _ _ _

Evaluationsbogen zu DIDSYM

Der Evaluationsbogen zu DIDSYM dient der Evaluation der auf Video aufgezeichneten Gespräche, die mit dem Dokumentationsbogen zur idiographischen Systemmodellierung (DIDSYM) protokolliert wurden.

Die Evaluator(innen) geben nach der Betrachtung des Videos ihren Eindruck über das Gespräch mit Hilfe der unten stehenden Ratingskala wider. Dabei wir die Stärke der Ausprägung mit Hilfe von vier Kategorien ausgedrückt (schwach bis stark). Die vier Abstufungen sind mit einer Prozentskala in Quartile unterteilt. Je höher die Ausprägung, desto höher muss die Einstufung erfolgen. Eine fünfte Kategorie (keine Ausprägung; 0%) dient als Ausschlusskategorie, wenn die Ausprägung eines Items nicht erkennbar/vorhanden ist. Schwierigkeiten bei der Einstufung eines Items sind im Kommentarfeld zu vermerken.

DIDSYM bietet den Vergleich der Perspektiven von Berater, Klient und Beobachter(n) über das gesamte Gespräch. Mit dem Evaluationsbogen zu DIDSYM werden zusätzliche Evaluationskriterien durch unabhängige Beobachter eingeführt, die auf den Gesprächsprozess während der idiographischen Systemmodellierung achten und von den Beteiligten im Beratungsprozess nicht beantwortet werden können.

Bevor das Video abgespielt wird, übertragen die Evaluator(innen) zunächst den Code des betreffenden Videos auf den Evaluationsbogen und geben ihren eigenen Namen an.

Nr.		Ausprägung				
	keine — Ausprägung — volle	keine	1-25%	26-50%	51-75%	76-100%
		0%				
1	Der Berater hat dem Klienten die Vorgehensweise der Systemmodellierung erklärt.	☐	☐	☐	☐	☐
2	Die Vorgehensweise und der Kommunikationsstil des Beraters waren an den kognitiv-emotionalen Zustand des Klienten angepasst.	☐	☐	☐	☐	☐
3	Die Vorgehensweise des Beraters war empathisch.	☐	☐	☐	☐	☐
4	Der Berater hat sich an den formalen Ablauf der Systemmodellierung gehalten.	☐	☐	☐	☐	☐
5	Der Berater hielt den Prozess der Systemmodellierung durch Strukturierung transparent.	☐	☐	☐	☐	☐
6	Der Berater erzeugte Yes-Sets.	☐	☐	☐	☐	☐
7	Der Berater hat aus Sicht des Evaluators alle relevanten Elemente des Systems identifiziert.	☐	☐	☐	☐	☐
8	Der Berater hat sich beim Klienten rückversichert, ob alle relevanten Elemente identifiziert worden sind.	☐	☐	☐	☐	☐
9	Der Berater hat sich rückversichert, ob das System alle sinnvoll möglichen Relationen identifiziert worden sind.	☐	☐	☐	☐	☐
10	Der Berater versicherte sich, dass er die Begriffe im Sinne des Klienten verstanden hat.	☐	☐	☐	☐	☐
11	Der Berater versicherte sich, dass er die Relationen im Sinne des Klienten verstanden hat.	☐	☐	☐	☐	☐
12	Der Berater fasste die verbalen Beschreibungen der Klienten zu Elementen oder Relationen für die Systemmodellierung zusammen.	☐	☐	☐	☐	☐
13	Der Berater hat gemeinsam mit dem Klienten erarbeitet, wo die Systemgrenze sinnvollerweise verläuft.	☐	☐	☐	☐	☐
14	Der Prozess der Systemmodellierung erfolgte in allen Abschnitten ressourcenorientiert.	☐	☐	☐	☐	☐
15	In dem Gespräch sind dynamische Muster des betrachteten Systems identifiziert worden.	☐	☐	☐	☐	☐
16	Der Berater hat den Klienten bei der Erstellung des Systemmodells mit einbezogen (Elemente/Modell).	☐	☐	☐	☐	☐
17	Der Berater hat mit dem Klienten besprochen, wie sie in der Beratung gemeinsam weiter arbeiten wollen.	☐	☐	☐	☐	☐
18	Der Klient hat aus der Systemmodellierung neue Einsichten gewonnen / Konsequenzen gezogen.	☐	☐	☐	☐	☐

Evaluationsbogen zu DIDSYM

Code: _ _ _ _ _ _   Evaluator(in): _____

Datum: _ _ _ _ _ _

Kommentar (Auffälliges, Ungewöhnliches im Gespräch):

Evaluationsbogen zu DIDSYM

Evaluationsbogen zur Idiographischen Systemmmodellierung (2)

Kriterien zur Bewertung der graphischen Darstellung idiographischer Systemmodelle

Ein Ergebnis der Methode der idiographischen Systemmodellierung ist ein graphisches Systemmodell, welches das in der Beratung erstellte System festhält. Es enthält alle relevanten Elemente und Relationen, die nötig sind, um die von Klienten während der Beratung vorgebrachten Aspekte ausreichend zu beschreiben. Aus der Darstellung der Systemmodelle sind dynamische Muster der Erlebens- und Verhaltenswelt der Klienten ablesbar.

Orientieren sich die Darstellungen solcher Modelle an bestimmten Merkmalen, ist die Güte der vorliegenden Systemmodelle bewertbar. Auch wird dadurch ein einheitlicher Standard zur Bewertung festgelegt und die Austauschbarkeit der Modelle mit anderen wird erleichtert. Des Weiteren dient eine Bewertung der idiographischen Systemmodelle der Kontrolle und Verbesserung der Technik der idiographischen Systemmodellierung in Weiter- und Fortbildungen der systemischen Beratung.

Die Bewertungskriterien teilen sich in zwei Gruppen auf: Kriterien zur Beratungsplanung und Beratungsgestaltung und kybernetische Kriterien. Die erste Gruppe von Kriterien beinhaltet Aspekte der Darstellung der Systeme und Dynamizität. Diese Kriterien werden auf einer vierstufigen Skala nach dem Grad der Ausprägung eingestuft.
Die Gruppe der kybernetischen Kriterien umfasst eine Reihe von Beschreibungen, mit denen die Funktion einzelner Elemente im Systemgefüge beschrieben werden kann. Diese Kriterien werden danach eingestuft, ob einzelne Elemente des Systemmodells in ihrer Funktion gekennzeichnet sind oder nicht. Eine weitere Differenzierung ist hierbei nicht sinnvoll.

Code: _ _ _ _ _ _ _ Evaluator(in): _____

Datum: _ _ _ _ _ _

Kriterien zur Beratungsplanung und -gestaltung

		Nicht vorhanden	Ungenügend vorhanden	Größtenteils vorhanden	Vollständig vorhanden
1.	Verständliche **Visualisierung** (einfach erfassbar, klar geordnete Struktur, lesbar)	☐	☐	☐	☐
2.	**Positive** Formulierung	☐	☐	☐	☐
3.	**Einfache, verständliche** Formulierungen	☐	☐	☐	☐
4.	Weitergehende **Beschreibung der Graphen** über + und – hinaus	☐	☐	☐	☐
5.	**Nachvollziehbarkeit** des Systemmodells in Bezug auf die Ausgangslage	☐	☐	☐	☐
6.	Geschlossene **Feedbackschleifen** (Einbindung der Elemente in Regelkreise)	☐	☐	☐	☐
7.	Vorliegen mehrerer **Referenzebenen** (biologisch, psychisch, sozial, …)	☐	☐	☐	☐
8.	**Lösungs- und ressourcenorientierte** Darstellung	☐	☐	☐	☐
9.	Ableitbarkeit von **praktischen Handlungsschritten** an verschiedenen Stellen	☐	☐	☐	☐
10.	Vermeidung von **pathologisierenden Einordnungen** im Modell	☐	☐	☐	☐
11.	Darstellung rekursiv vernetzter **Submodelle** (eigenständige Regelkreise)	☐	☐	☐	☐

Bewertungskriterien für idiographische Systemmodelle

Bewertungskriterien für idiographische Systemmodelle

Code: _ _ _ _ _ _   Evaluator(in): _____

Datum: _ _ _ _ _ _ _

Kybernetische Kriterien

	Kennzeichnung	Keine Kennzeichnung
1. Gemischtes Feedback (Darstellung positiver und negativer Feedbackschleifen)	☐	☐
2. Puffernde Komponenten (Auswirkung einer Einheit sind nicht in gleichem Maße wie die Einwirkung auf diese Einheit)	☐	☐
3. Unveränderliche Komponenten (Einheit an sich veränderbar, aber im kontextuellen Rahmen nicht veränderlich)	☐	☐
4. Nichtregulierbare Komponenten (Einheit ist prinzipiell veränderlich, aber nicht zugänglich)	☐	☐
5. Grenzwerte (maximal mögliche Ausprägung einer Einheit)	☐	☐
6. Schwellenwerten (Dynamik ändert sich, wenn bestimmter Wert der Einheit erreicht ist)	☐	☐
7. Entwicklungen (Wachstums-, Schrumpfungstendenzen)	☐	☐
8. Außenkontakte (für die als System bezeichnete Einheit; gesellschaftliches und ökologisches Umfeld)	☐	☐
9. Außenabhängigkeiten (Funktionieren des Systems ist bestimmt von Einheiten außerhalb des beschriebenen Systems)	☐	☐
10. Innenabhängigkeiten (Funktionieren des Systems von bestimmten Einheiten des beschriebenen Systems bestimmt)	☐	☐

Code: _ _ _ _ _ _   Evaluator(in): _____

Datum: _ _ _ _ _ _ _

Kriterien zur Bewertung der graphischen Darstellung idiographischer Systemmodelle
ZUSATZ

Im Laufe der Bewertung der idiographischen Systemmodelle wurde es nötig, den bestehenden Bewertungsbogen zu erweitern, was mit Hilfe dieses Zusatzes geschieht. Es wurde notwendig bei der Bewertung der Systemmodelle mehr Kriterien zur Beschreibung einzuführen, um die Güte eines Systemmodells zu bestimmen.

Kriterien zur Beratungsplanung und –gestaltung

ZUSATZ

	Nicht vorhanden	Ungenügend vorhanden	Größtenteils vorhanden	Vollständig vorhanden
12. Die Relationen sind mit **+ oder –** bezeichnet.	☐	☐	☐	☐
13. Die **Beeinflussungsrichtung** zwischen den Elementen ist gekennzeichnet (nicht nur die Verknüpfung zweier Elemente).	☐	☐	☐	☐

Bewertung der Systemmodelle (2)

Appendix C

Generic Principles

C.1 DUGEP - Dokumentationsbogen zur Umsetzung der Generischen Prinzipien

C.2 DUGEP - Evaluationsbogen Generische Prinzipien

DUGEP

Dokumentationsbogen zur Umsetzung der Generischen Prinzipien

Der Dokumentationsbogen zur Umsetzung der Generischen Prinzipien (DUGEP) stellt Rating-Skalen bereit, die den systemischen Berater darin unterstützen, sensibel auf unterschiedliche Aufnahme- und Reaktionsbereitschaften seiner Klienten zu reagieren und darauf ihre Beratungstechniken und –interventionen auszuwählen. Ein Berater setzt DUGEP bei einem Beratungsgespräch ein, das auf Video aufgenommen wird. Der Dokumentationsbogen bietet Rating-Skalen, mit deren Hilfe das Beratungsgespräch nach Beendigung eingeschätzt wird. Durch das Video und die Skalen stehen dem Berater zusätzliche Informationen zum Gesprächsverlauf zur Verfügung. DUGEP ist auf Beratungsgespräche im Einzelpersonensetting mit Beobachtern ausgelegt, eignet sich aber auch für die Durchführung im Mehrpersonensetting.

Die Daten, die Sie in diesem Dokumentationsbogen angeben, werden vertraulich behandelt. Die Auswertung des Bogens erfolgt in anonymisierter Form. Dies wird durch einen persönlichen Code gewährleistet, den Sie angeben, wie unten erläutert.

Bevor Sie beginnen, tragen Sie bitte zuerst Ihren persönlichen Code ein. Benutzen Sie dabei stets den gleichen Code. Die Zusammenstellung lautet:
Die ersten beiden Buchstaben des Vornamens der Mutter: z.B. Christl
Die ersten beiden Buchstaben des Vornamens des Vaters: z.B. Franz
Das zweistellige Geburtsjahr der Mutter: z.B. 1946
   Daraus folgt der Code: z.B. ChFr 46

Ihr persönlicher Code: _ _ _ _ _ _

Bitte tragen Sie zuallererst Ihren persönlichen Code auf jeder der folgenden Seiten ein. Vergessen Sie auch nicht, Ihren Code auf den Rating-Skalen der Klienten und der Beobachter einzutragen.

Viel Erfolg!

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Tel. privat: 06157 157114
E-Mail: Marco.Paukert@web.de

Code: _ _ _ _ _ _

Dokumentationsbogen DUGEP

Systemische Berater werden bei der Anwendung des Dokumentationsbogens DUGEP und der Videoaufnahme auf zwei Arten unterstützt:
1. **Video-Feedback** ermöglicht die nachträgliche und wiederholbare Besprechung und Analyse durch die Aufnahme des vollständigen Beratungsprozesses
2. **Rating-Skalen** geben direktes Feedback zum Beratungsverlauf durch die Teilnehmer

Mit DUGEP wird ein Beratungsgespräch von der Begrüßung des Klienten bis zu dessen Verabschiedung dokumentiert und ermöglicht damit die spätere Analyse des Gesprächs. Achten Sie als Berater insbesondere auf unterschiedliche Aufnahme- und Reaktionsbereitschaften ihrer Klienten und versuchen Sie Ihr Beratungsverhalten daraufhin auszurichten.

Beratungsgespräch

Ein Beratungsgespräch kommt dann zustande, wenn sich ein Klient mit einem Anliegen (Fragestellung, Problem) an einen Berater/Beraterin wendet, um Unterstützung bei der Lösung dieser Fragestellung zu bekommen.
Die typische Beratungssituation besteht aus einem Berater, einem Klienten und einem Beobachter (mehrere Beobachter möglich):
In einem Beratungsgespräch soll der **Berater** einen Klienten dabei zu unterstützen, dessen Anliegen zu bearbeiten. Dies macht er, indem er sich das Anliegen des Klienten schildern lässt, mit ihm darauf ein Ziel erarbeitet und schließlich Wege und Mittel identifiziert, dieses Ziel zu erreichen.

Der **Klient** kommt zu einer Beratung, um Unterstützung bei seinem Anliegen zu bekommen. Im Rahmen der Übungsgespräche, die mit DUGEP durchgeführt werden, ist die Art des Anliegens nicht vorgegeben. Die Beratungsgespräche sind Rollenspiele; die Inhalte können frei erfunden sein oder einen realen Hintergrund haben. Für den Übungsverlauf ist es sicherlich hilfreich, keine sehr schwerwiegenden oder tragischen Fälle zu bringen. Als Ausgangspunkt oder Anregung für ein Beratungsgespräch können folgende Aussagen als Beispiel dienen:

> *..... ich gehe nicht mehr gerne arbeiten, denn ich habe eine Kollegin, die mich ständig mit ihren Problemen belästigt ...."*
> *..... ich mache im Haushalt sehr viel mehr als mein Freund ..."*
> *..... ich komme gar nicht mehr dazu, etwas zu tun, was mir Spaß macht; ständig muss ich Dinge tun, die ich nicht will ...."*

Der **Beobachter** beobachtet das Beratungsgespräch ohne dabei einzugreifen, und kann nach der Beratung Rückmeldung dazu geben, was ihm während des Gesprächs aus seiner Perspektive aufgefallen ist. Der Beobachter sitzt abseits von Berater und Klient, aber so, dass er die Beratung gut verfolgen kann.

Der **Ablauf eines Beratungsgesprächs** gliedert sich dabei in verschiedene Abschnitte: Es beginnt mit der Begrüßung des Klienten durch den Berater. Dann gilt es, das Anliegen des Klienten zu identifizieren und mit ihm herauszufinden, was er möchte (Zielfindung). An die Identifikation des Ziels schließt sich an, wie der Klient dieses Ziel erreichen kann. Das Gespräch endet mit einer Rückmeldung des Beraters über das Gespräch und der Verabschiedung des Klienten.

DUGEP – Dokumentationsbogen zur Umsetzung der Generische Prinzipien

2

Code: ___ ___ ___ ___

Anwendung von DUGEP:

Der Berater ist für die Anwendung des Dokumentationsbogens verantwortlich.
Bei der Arbeit mit dem Dokumentationsbogen DUGEP gehen Sie als Berater folgendermaßen vor:

1. Bereiten Sie das Beratungssetting vor.
2. Bereiten Sie die Videokamera für die Aufnahme vor. Achten Sie auf ausreichende Beleuchtung und machen Sie einen Tontest.
3. Füllen Sie die Eckdaten des Dokumentationsbogens aus (S. 4).
4. Führen Sie mit Ihrem Klienten ein Beratungsgespräch. Nehmen Sie dieses Beratungsgespräch auf Video auf.
5. Vervollständigen Sie die Eckdaten (Gesprächsende und –dauer) des Dokumentationsbogens (S. 4).
6. Verteilen Sie die Rating-Skala für Klienten (S. 8) an den Klienten und die Rating-Skala für Beobachter (S. 9) an den Beobachter. Haben mehrere Beobachter die Beratung verfolgt, so einigen sich die Beobachter auf eine Einschätzung und geben gemeinsam einen Bogen ab.
7. Das Ausfüllen der Rating-Skalen durch Berater, Klient und Beobachter erfolgt unabhängig voneinander.
8. Füllen Sie selbst die Rating-Skala für Berater aus (S. 7).
9. Sammeln Sie die Rating-Skalen ein. Bei Bedarf können Sie sich mit den Klienten und Beobachtern über deren Einschätzungen austauschen.
10. Haben Sie alles dokumentiert, dann geben Sie den ausgefüllten Dokumentationsbogen und die Videoaufnahme zurück. Eine Kopie können Sie gerne behalten.

DUGEP – Dokumentationsbogen zur Umsetzung der Generische Prinzipien   3

Code: ___ ___ ___ ___ ___

Protokolldaten:

Gesprächsdatum : ____ . ____ . 20 __

Gesprächsbeginn: _____ Uhr

Gesprächsende: _____ Uhr

Gesprächsdauer: _____ Minuten

Freiwillige Protokolldaten:

Wenn Sie möchten, können Sie für die spätere Nachvollziehbarkeit des Gesprächs die Namen der beteiligten Personen angeben. Sie können die Namen auch gerne anonymisieren oder einen Code (siehe Titelblatt) vergeben.

Berater: _____

Klient: _____

Beobachter 1: _____

Beobachter 2: _____

Beobachter 3: _____

DUGEP – Dokumentationsbogen zur Umsetzung der Generische Prinzipien   4

Code: ___ ___ ___

Rating-Skala für Klienten:

Bitte füllen Sie die nachfolgende Rating-Skala nach Beendigung der Systemmodellierung aus. Bei den Antworten gibt es kein Richtig oder Falsch, es geht dabei um *Ihre* ganz persönliche Sicht.

Nr.		Stimme nicht zu	Stimme überwiegend nicht zu	weder noch	Stimme überwiegend zu	Stimme zu
1.	Zum Berater habe ich Vertrauen aufgebaut.	☐	☐	☐	☐	☐
2.	Die Fragen des Beraters empfand ich jederzeit als passend und stimmig.	☐	☐	☐	☐	☐
3.	Der Berater hat mit mir das Bezugssystem identifiziert, um das es in der Beratung geht.	☐	☐	☐	☐	☐
4.	Der Berater hat meine Ideen und Beiträge gewürdigt.	☐	☐	☐	☐	☐
5.	Der Lösungsweg, den ich erarbeitet habe, passt zu mir.	☐	☐	☐	☐	☐
6.	Mir ist deutlich geworden, dass ich an meiner jetzigen Situation etwas ändern muss.	☐	☐	☐	☐	☐
7.	Ich fühlte mich sicher und gut aufgehoben.	☐	☐	☐	☐	☐
8.	Die Beratung hat mich ermutigt, neue Schritte zu gehen.	☐	☐	☐	☐	☐
9.	Die Beratung hat mir Vertrauen in meine eigenen Fähigkeiten gegeben.	☐	☐	☐	☐	☐
10.	Die Beratung hat mir geholfen, mich für einen bestimmten Weg zu entscheiden.	☐	☐	☐	☐	☐
11.	Mir sind die Ressourcen bewusst geworden, mit denen ich mein Problem bewältigen kann.	☐	☐	☐	☐	☐
12.	Die Beratung unterstützt mich dabei, mich in Zukunft anders als bisher zu verhalten.	☐	☐	☐	☐	☐
13.	Die Beratung empfinde ich als bedeutsam für meinen zukünftigen Lebensweg.	☐	☐	☐	☐	☐
14.	Der Berater hat immer wieder auf das identifizierte Bezugssystem zurückgegriffen.	☐	☐	☐	☐	☐
15.	Die Beratung hat mich unterstützt, experimentierfreudiger zu sein.	☐	☐	☐	☐	☐
16.	Die Beratung hat mich bestärkt, mein Ziel zu verwirklichen.	☐	☐	☐	☐	☐
17.	Ich kann mir gut vorstellen, inwiefern mein Leben nach dieser Beratung anders sein wird.	☐	☐	☐	☐	☐
18.	Für mich lohnen sich die Mühe und Anstrengung der Beratung.	☐	☐	☐	☐	☐
19.	Mit dem was der Berater mir angeboten hat, konnte ich etwas anfangen.	☐	☐	☐	☐	☐
20.	Die Beratung hat mich unterstützt, motivierende Ziele zu finden.	☐	☐	☐	☐	☐
21.	Das Tempo der Beratung war auf mich abgestimmt.	☐	☐	☐	☐	☐
22.	Die Beratung hat mich unterstützt, mein Ziel stets vor Augen zu haben.	☐	☐	☐	☐	☐
23.	Jetzt sehe ich meine Situation anders als vorher.	☐	☐	☐	☐	☐

DUGEP – Dokumentationsbogen zur Umsetzung der Generische Prinzipien   6

Code: ___ ___ ___

Rating-Skala für Berater:

Bitte füllen Sie die nachfolgende Rating-Skala nach Beendigung der Systemmodellierung aus. Bei den Antworten gibt es kein Richtig oder Falsch, es geht dabei um *Ihre* ganz persönliche Sicht.

Nr.		Stimme nicht zu	Stimme überwiegend nicht zu	weder noch	Stimme überwiegend zu	Stimme zu
1.	Der Klient hat Vertrauen zu mir aufgebaut.	☐	☐	☐	☐	☐
2.	Meine Fragen empfand der Klient jederzeit als passend und stimmig.	☐	☐	☐	☐	☐
3.	Ich habe mit dem Klienten das Bezugssystem identifiziert, um das es in der Beratung geht.	☐	☐	☐	☐	☐
4.	Ich habe die Ideen und Beiträge des Klienten gewürdigt.	☐	☐	☐	☐	☐
5.	Der Lösungsweg, den der Klient erarbeitet hat, passt zu ihm.	☐	☐	☐	☐	☐
6.	Dem Klienten ist deutlich geworden, dass er an seiner jetzigen Situation etwas ändern muss.	☐	☐	☐	☐	☐
7.	Der Klient fühlte sich sicher und gut aufgehoben.	☐	☐	☐	☐	☐
8.	Die Beratung hat den Klienten ermutigt, neue Schritte zu gehen.	☐	☐	☐	☐	☐
9.	Die Beratung hat dem Klienten Vertrauen in seine eigenen Fähigkeiten gegeben.	☐	☐	☐	☐	☐
10.	Die Beratung hat dem Klienten geholfen, sich für einen bestimmten Weg zu entscheiden.	☐	☐	☐	☐	☐
11.	Dem Klienten sind die Ressourcen bewusst geworden, mit denen er sein Problem bewältigen kann.	☐	☐	☐	☐	☐
12.	Die Beratung unterstützt den Klienten dabei, sich in Zukunft anders als bisher zu verhalten.	☐	☐	☐	☐	☐
13.	Der Klient empfindet die Beratung als bedeutsam für seinen zukünftigen Lebensweg.	☐	☐	☐	☐	☐
14.	Ich habe immer wieder auf das identifizierte Bezugssystem zurückgegriffen.	☐	☐	☐	☐	☐
15.	Die Beratung hat den Klienten unterstützt, experimentierfreudiger zu sein.	☐	☐	☐	☐	☐
16.	Die Beratung hat den Klienten bestärkt, sein Ziel zu verwirklichen.	☐	☐	☐	☐	☐
17.	Der Klient kann sich gut vorstellen, inwiefern sein Leben nach dieser Beratung anders sein wird.	☐	☐	☐	☐	☐
18.	Für den Klienten lohnen sich die Mühe und Anstrengung der Beratung.	☐	☐	☐	☐	☐
19.	Der Klient konnte mit dem, was ich ihm angeboten habe, etwas anfangen.	☐	☐	☐	☐	☐
20.	Die Beratung hat den Klienten unterstützt, motivierende Ziele zu finden.	☐	☐	☐	☐	☐
21.	Das Tempo der Beratung war auf den Klienten abgestimmt.	☐	☐	☐	☐	☐
22.	Die Beratung hat den Klienten unterstützt, sein Ziel stets vor Augen zu haben.	☐	☐	☐	☐	☐
23.	Der Klient sieht seine Situation jetzt anders als vorher.	☐	☐	☐	☐	☐

DUGEP – Dokumentationsbogen zur Umsetzung der Generische Prinzipien   5

Code: ___ ___ ___ ___

Rating-Skala für Beobachter:

Bitte füllen Sie die nachfolgende Rating-Skala nach Beendigung der Systemmodellierung aus. Bei den Antworten gibt es kein Richtig oder Falsch, es geht dabei um *ihre* ganz persönliche Sicht.

Nr.		Stimme nicht zu	Stimme überwiegend nicht zu	weder noch	Stimme überwiegend zu	Stimme zu
1.	Der Klient hat Vertrauen zum Berater aufgebaut.	☐	☐	☐	☐	☐
2.	Die Fragen des Beraters empfand der Klient jederzeit als passend und stimmig.	☐	☐	☐	☐	☐
3.	Der Berater hat mit dem Klienten das Bezugssystem identifiziert, um das es in der Beratung geht.	☐	☐	☐	☐	☐
4.	Der Berater hat die Ideen und Beiträge des Klienten gewürdigt.	☐	☐	☐	☐	☐
5.	Der Lösungsweg, den der Klient erarbeitet hat, passt zu ihm.	☐	☐	☐	☐	☐
6.	Dem Klienten ist deutlich geworden, dass er an seiner jetzigen Situation etwas ändern muss.	☐	☐	☐	☐	☐
7.	Der Klient fühlte sich sicher und gut aufgehoben.	☐	☐	☐	☐	☐
8.	Die Beratung hat den Klienten ermutigt, neue Schritte zu gehen.	☐	☐	☐	☐	☐
9.	Die Beratung hat dem Klienten Vertrauen in seine eigenen Fähigkeiten gegeben.	☐	☐	☐	☐	☐
10.	Die Beratung hat dem Klienten geholfen, sich für einen bestimmten Weg zu entscheiden.	☐	☐	☐	☐	☐
11.	Dem Klienten sind die Ressourcen bewusst geworden, mit denen er sein Problem bewältigen kann.	☐	☐	☐	☐	☐
12.	Die Beratung unterstützt den Klienten dabei, sich in Zukunft anders als bisher zu verhalten.	☐	☐	☐	☐	☐
13.	Der Klient empfindet die Beratung als bedeutsam für seinen zukünftigen Lebensweg.	☐	☐	☐	☐	☐
14.	Der Berater hat immer wieder auf das identifizierte Bezugssystem zurückgegriffen.	☐	☐	☐	☐	☐
15.	Die Beratung hat den Klienten unterstützt, experimentierfreudiger zu sein.	☐	☐	☐	☐	☐
16.	Die Beratung hat den Klienten bestärkt, sein Ziel zu verwirklichen.	☐	☐	☐	☐	☐
17.	Der Klient kann sich gut vorstellen, inwiefern sein Leben nach dieser Beratung anders sein wird.	☐	☐	☐	☐	☐
18.	Für den Klienten lohnen sich die Mühe und Anstrengung der Beratung.	☐	☐	☐	☐	☐
19.	Der Klient konnte mit dem, was der Berater ihm angeboten hat, etwas anfangen.	☐	☐	☐	☐	☐
20.	Die Beratung hat den Klienten unterstützt, motivierende Ziele zu finden.	☐	☐	☐	☐	☐
21.	Das Tempo der Beratung war auf den Klienten abgestimmt.	☐	☐	☐	☐	☐
22.	Die Beratung hat den Klienten unterstützt, sein Ziel stets vor Augen zu haben.	☐	☐	☐	☐	☐
23.	Der Klient sieht seine Situation jetzt anders als vorher.	☐	☐	☐	☐	☐

DUGEP - Dokumentationsbogen zur Umsetzung der Generische Prinzipien (4)

Evaluationsbogen zu DUGEP   Seite: ____

Skala: nicht erkennbare Ausprägung = 0; schwache Ausprägung = 1 bis starke Ausprägung = 4;

Gen. Pri. / Ausprägung im Intervall i_k	9		10		11		12		13		14		15		16	
Absicht des Beraters/ Reaktion des Klienten	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK
Generisches Prinzip I																
Generisches Prinzip II																
Generisches Prinzip III																
Generisches Prinzip IV																
Generisches Prinzip V																
Generisches Prinzip VI																
Generisches Prinzip VII																
Generisches Prinzip VIII																

Skala: nicht erkennbare Ausprägung = 0; schwache Ausprägung = 1 bis starke Ausprägung = 4;

Gen. Pri. / Ausprägung im Intervall i_k	1		2		3		4		5		6		7		8	
Absicht des Beraters/ Reaktion des Klienten	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK
Generisches Prinzip I																
Generisches Prinzip II																
Generisches Prinzip III																
Generisches Prinzip IV																
Generisches Prinzip V																
Generisches Prinzip VI																
Generisches Prinzip VII																
Generisches Prinzip VIII																

Evaluator(in): _____

Code: _ _ _ _ _ _ _
Datum: _ _ _ _ _ _ _

Evaluationsbogen zu DUGEP

Der Evaluationsbogen zu DUGEP dient der Evaluation der mit Hilfe des „Dokumentationsbogens zur Umsetzung der Generischen Prinzipien" (DUGEP) auf Video aufgezeichneten Gespräche. Dabei wird in **2-Minuten-Intervallen** die Verwirklichung der Generischen Prinzipien von Evaluator(innen) eingeschätzt. In jedem Intervall werden für jedes Generische Prinzip zwei Wertungen abgegeben:

1. die erste Wertung (AB) gibt an, wie stark der Berater versucht, das jeweilige Generische Prinzip zu initiieren / umzusetzen / aufrechtzuerhalten
2. die zweite Wertung (RK) gibt an, wie sich der Klient verhält, wie stark er selbst das jeweilige Generische Prinzip erlebt und auf die Bemühungen des Beraters eingeht

Die Stärke der Ausprägung wird mit Hilfe von vier Kategorien ausgedrückt (schwach bis stark). Die vier Abstufungen sind mit einer Prozentskala in Quartile unterteilt. Je höher die Ausprägung, desto höher muss die Einstufung erfolgen. Eine fünfte Kategorie (keine Ausprägung; 0%) dient als Ausschlusskategorie, wenn die Ausprägung eines Items nicht erkennbar/vorhanden ist. Schwierigkeiten bei der Einstufung eines Items sind im Kommentarfeld zu vermerken.

DUGEP bietet den Vergleich der Perspektiven von Berater, Klient und Beobachter(n) über das gesamte Gespräch. Durch den Evaluationsbogen zu DUGEP werden Zeitreihen über die Ausprägung der acht Generischen Prinzipien über den gesamten Gesprächsverlauf gewonnen.

Die Evaluator(innen) übertragen zunächst den Code des betreffenden Videos auf den Evaluationsbogen, geben ihren eigenen Namen an und vermerken die Seitenzahl. Das Video wird nach zwei Minuten gestoppt. Daraus ergibt sich das Evaluationsintervall 1, für das die Ausprägung der Generischen Prinzipien für den Berater (AB) und den Klienten (RK) bewertet wird. Danach wird die Videoaufzeichnung über den Verlauf des gesamten Gesprächs wieder fortgesetzt. Füllt das letzte Evaluationsintervall keine vollen zwei Minuten aus, dann wird handschriftlich auf dem Bogen vermerkt, wie lange das letzte Intervall war. Dauert ein Gespräch länger als 16 Evaluationsintervalle werden die zusätzlichen Intervalle per Hand auf den leeren Evaluationsbogen eingetragen und die Bewertung dort fortgeführt.

Evaluationsbogen zu DUGEP

Code: __ __ __ __ __ __   Evaluator(in): _____
Datum: __ __ __ __ __ __

Gen. Pri. / Ausprägung im Intervall i_x																
Absicht des **B**eraters/ **R**eaktion des **K**lienten	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK
Generisches Prinzip I																
Generisches Prinzip II																
Generisches Prinzip III																
Generisches Prinzip IV																
Generisches Prinzip V																
Generisches Prinzip VI																
Generisches Prinzip VII																
Generisches Prinzip VIII																

Skala: nicht erkennbare Ausprägung = 0; schwache Ausprägung = 1 bis starke Ausprägung = 4;

Gen. Pri. / Ausprägung im Intervall i_x																
Absicht des **B**eraters/ **R**eaktion des **K**lienten	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK	AB	RK
Generisches Prinzip I																
Generisches Prinzip II																
Generisches Prinzip III																
Generisches Prinzip IV																
Generisches Prinzip V																
Generisches Prinzip VI																
Generisches Prinzip VII																
Generisches Prinzip VIII																

Skala: nicht erkennbare Ausprägung = 0; schwache Ausprägung = 1 bis starke Ausprägung = 4;

Evaluationsbogen zu DUGEP   Seite: ____

Code: __ __ __ __ __ __   Evaluator(in): _____
Datum: __ __ __ __ __ __

Kommentar (Auffälliges, Ungewöhnliches im Gespräch):

_____

_____

_____

_____

_____

Evaluationsbogen zu DUGEP   Seite: ____