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Research Report No. 21

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Strasser, J., & Gruber, H. (2006). *Learning processes in the professional development of counselors: The role of illness script formation* (Research Report No. 21). Regensburg: Universität Regensburg, Lehrstuhl für Lehr-Lern-Forschung.

Research Report No. 21, August 2006

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**Learning processes in the professional development of counselors:
The role of illness script formation**

Josef Strasser and Hans Gruber

UBR 069034782405



G09-1042

Abstract

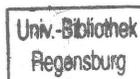
Learning processes in the professional development of counselors have rarely been analyzed. An important component thereof is the integration of professional experience and basic knowledge and skills. In this study, it was investigated whether psychological counselors of different levels of expertise differ in their availability of experience-based knowledge structures, so called illness scripts. Thirty-one counselors were prompted with 20 different categories of client problems, and their use of knowledge was analyzed using thinking-aloud protocols. Experts' knowledge, but not intermediates' and novices', was organized in script-like structures that integrate fundamental and experiential knowledge and help experts in quickly and effortlessly accessing relevant knowledge. Implications of these findings for training and professional learning of counselors are discussed.

Keywords: counseling, professional development, experience, illness scripts

Zusammenfassung

Wie Berater im Verlauf ihrer beruflichen Entwicklung lernen, ist bislang weitgehend nicht untersucht wurden. Ein wichtiger Aspekt beruflichen Lernens ist die adäquate Integration grundlegenden Wissens und professioneller Erfahrung. In der vorliegenden Studie wurde untersucht, ob sich psychologischer Berater unterschiedlicher Expertise dahingehend unterscheiden, inwieweit sie auf entsprechend integrierte Wissensstrukturen zurückgreifen können. Zur Modellierung der erfahrungsbasierten Wissensstrukturen wurde auf das Konzept der illness scripts recurriert. 31 Berater wurden mit zwanzig unterschiedlichen Beratungsanlässen konfrontiert, zu denen sie ihr Wissen mittels lautem Denken darlegen sollten. Nur das Wissen der Experten, nicht aber der Novizen und Semi-Experten, war in skriptähnlichen Strukturen organisiert, die grundlegendes und erfahrungsbasiertes Wissen derart integrieren, dass Experten rasch und flexibel auf relevante Informationen zugreifen können. Die Implikationen dieser Befunde für die Aus- und Weiterbildung von Beratern werden diskutiert.

Stichworte: Beratung, professionelle Entwicklung, Erfahrung, illness scripts



Introduction

To become a good and effective counselor requires the acquisition of a great deal of knowledge. The professional knowledge for counseling consists of a variety of different concepts, principles, skills, rules and procedures. These are not acquired for their own sake but in order to help people in problematic situations. It is necessary for this knowledge to be acquired and organized in a way that it can quickly be accessed and applied in different counseling situations. It is plausible to assume that there are different learning processes that lead to counseling competence based on more or less applicable knowledge structures. Knowledge that is represented in scripts meets these conditions. Unfortunately learning processes in the professional development of counselors have rarely been described or thoroughly been analyzed. To overcome this deficit it is helpful to consider findings from related professional domains. In medicine it has been shown that experienced physicians form script like knowledge structures, so called illness scripts (Custers, Boshuizen, & Schmidt, 1998). These scripts help to bridge their conceptual and their experiential knowledge. The formation of illness scripts is a very important learning process in the novice-to-expert transition. Thus it is of utmost importance for fostering professional learning (Boshuizen, Bromme, & Gruber, 2004).

The purpose of the paper is to investigate whether similar learning processes take place during the professional development of counselors. To get insight into learning processes of counselors it is indispensable for a discipline the mastery of which is that difficult to acquire as it is in counseling. To reach this objective some assumptions associated with the idea of illness script formation are tested as well as its implications for the domain of counseling are explored. Based on the results of a recent study the "promises" and the limitations of this concept are discussed in regard to the domain of counseling.

Theoretical framework

Knowledge: A fundamental base for counseling competence

Most models of counseling competence emphasize the importance of validated knowledge (Skovholt & Jennings, 2004; Strasser & Gruber, 2003). To get along adequately with the problems of their clients, counselors have to know a lot about disorders, their etiology and their treatment. Little is known about the acquisition of that knowledge and the changes the counselor's knowledge is subject to in the course of her / his professional career.

Learning careers of counselors

In the education and training of counseling psychologists theoretical and practical phases take turns. In theoretical phases the students are to be equipped with the concepts and theories which are of an alleged relevance for professional performance (Gladding, 2004; Seligman, 2004). Normally the teaching of basic concepts and theories precedes the teaching of clinical and applied subjects, as basic concepts may help to understand the phenomena one is confronted with in clinical practice. Hence, typically after having learnt the fundamental concepts, students are thought to practice their acquired knowledge in periods of internships and hands-on trainings. Different kinds of learning and instruction are associated with these different periods from which different learning outcomes may arise. To prevent knowledge compartmentalization is not always easy; the way to mastery of the domain involves a continuing process of adding, integrating and reorganizing knowledge (Mandl, Gruber, & Renkl, 1993). Counseling expertise thus does not only require rich and flexible conceptual knowledge, but counselors also have to learn to make use of that knowledge in their counseling practice. The underlying learning processes have not yet been thoroughly investigated. It has been shown, however, that plain experience in professional practice does not suffice: During their professional career, counselors and, similarly, therapists hardly benefit from their practical experiences (Caspar, 1997; Dowie & Elstein, 1988). Specific characteristics of counseling practice - highly specific cases, ill-structured tasks, time pressure - may account for this result. Thus, it is difficult to relate the

phenomena of one's everyday counseling practice to the theories acquired in training programs. These difficulties frequently leads to the phenomenon that counselors, although they evidence "learning-relevant" episodes in their practice, fail to define them as episodes of learning and knowledge application. This conclusion is supported by Dawes' (1994) observation of counselors' beliefs on the nature of their learning. Many therapists and counselors consider counseling skills as something that is learned fairly automatically through practice. But, as Lichtenberg (1997) pointed out, counseling skills mainly involve conscious cognitive processes on the part of the counselor, e. g. in decision-making. Deficits in conceptual skills contribute to unsuccessful counseling processes or therapeutic failures (Caspar, Berger, & Hautle, 2004; Crits-Cristoph, Cooper, & Luborsky, 1988; Silberschatz, Fretter, & Curtis, 1986). Although this seems obvious, the importance of conceptual skills has been neglected by the professional literature until recently (Seligman, 2004). Therefore Duys and Hedstrom (2000) emphasized that "counselors encounter conceptually complex variables when working with clients. Case conceptualization skills, understanding the flow and process of the counseling relationship, attending to multicultural dynamics, and the use of counseling theory call for increasingly complex cognitive processes" (Duys & Hedstrom, 2000, p. 8).

Solving such complex tasks requires different forms of knowledge. In contrast to counseling, the relation between learning, knowledge and problem solving skills has been extensively investigated in domains like medicine. We argue that this research is most valuable for understanding the professional development in counseling as well.

Professional learning: Development and restructuring of experience-based knowledge

Research on the acquisition of expertise revealed that during training and practice the knowledge of students and practitioners within a domain changes its structure. It becomes more elaborate, more accurate and is organized in a more coherent and adequate way (Patel & Kaufman, 1995; Van de Wiel, Boshuizen, & Schmidt, 2000).

Different learning mechanisms lead to a well organized knowledge base. These mechanisms of knowledge acquisition have been mainly investigated in the domain of medicine. In contrast to the more theoretical learning process in the pre-clinical period that involves the active construction and memorization of models of the human body's functioning, learning gets more experiential in medical practice. In all phases the transition from novice to expert knowledge structures includes three general learning mechanisms as proposed by Rumelhart and Norman (1978): Accretion (accumulation of new information), tuning (conditionalization of existing knowledge structures) and restructuring (creating new structures through modification of old ones).

In a first step, these learning processes lead to well-integrated conceptual networks. Such networks are an outcome of the student's knowledge accumulation, validation and integration. In medicine, clinical reasoning that is based on such knowledge structures typically involves chains of small steps connecting detailed biomedical concepts. Medical students in this stage show elaborated causal networks can be discerned. They are able to explain the causes and consequences of an illness in terms of underlying pathophysiological processes. Network-related learning mechanisms (strengthening of concepts and links) are typical for the second stage; the process of producing direct links between frequently used concepts and the skipping of less relevant is labeled knowledge encapsulation (Boshuizen, 2003). Encapsulation accounts for the restructuring of medical knowledge that can be observed in the development from novice to expert. It is a result of repeated knowledge application in clinical practice. As encapsulating concepts cluster and summarize rich and detailed information, the practitioners' knowledge gets more easily accessible and more flexibly usable. The third learning process finally entails highly applicable structures that are no longer organized in networks. This learning mechanism is referred to as illness script formation. As we propose this step as a critical component for understanding the development of expertise in counseling, it is discussed in more detail.

Professional learning in counseling: Does illness script formation occur?

The concept of illness script formation (Schmidt, Boshuizen, & Norman, 1992) is based on cognitive script theories. Scripts are experience-based knowledge structures that describe generalized event sequences. They encompass things (e. g. events, objects, roles) that may be expected to occur in situations one is familiar with. Scripts indicate which aspects in a situation are fixed and which other aspects may be variable or optional. A characteristic feature of scripts is that they are activated as wholes, once a script is activated all of its single elements are also immediately and automatically activated. This allows people to make quick predictions about the probable course of action. The underlying mechanism is the filling in of default values to empty slots. This assignment of current and default values in an activated script is called script instantiation.

Feltovich and Barrows (1984) introduced the notion of illness scripts in the domain of medicine. Illness scripts are activated and instantiated by a physician in medically relevant situations, in particular during diagnosing. Illness scripts encompass three components. (1) *enabling conditions* which are contextual and patient background factors, the conditions and constraints under which a certain disease occurs. These conditions presumably contribute to the (2) *fault*, that is the underlying pathophysiological malfunctioning, the disturbed body functions. This fault entails certain (3) *consequences*, for instance certain complaints, signs and symptoms.

When diagnosing a case, experienced physicians primarily take enabling conditions and one or two consequences into account, because these features are most salient for them, whereas biomedical information concerning the fault is neglected in generating hypotheses (Custers et al., 1998). Biomedical, fault-based knowledge is more relevant for less experienced practitioners, as they have trouble activating adequate illness scripts and therefore fail to recognize (disease-specific) patterns of enabling conditions and consequences. To make sense of the information they gather in a diagnostic situation, they have to "consult" their biomedical knowledge (Schmidt et al., 1992). When experienced physicians are not able to make sense of a specific case, i. e. when they are confronted with unusual constellations of enabling

conditions and consequences or with decontextualized cases, they also have to return to their biomedical knowledge base.

Similarly, novice counselors' reasoning about a case may be based on their explicit knowledge about the definition and diagnosis of mental disorders, expert counselors' experience allows them to recognize certain constellations of symptoms and client background factors almost immediately.

The formation of illness scripts primarily takes place in clinical practice, when physicians have to deal with "real" cases. Thus, they get to know "real" patients with their histories and complaints. This experience helps to integrate the basic declarative knowledge about the fault, the underlying pathophysiological processes with the information about the contextual conditions and constraints of diseases. The formation of illness scripts describes the clustering and integration of contextual and basic knowledge. During this process basic knowledge about the underlying processes, the fault, does not disappear, but is still accessible, mainly in encapsulated form. The advantage of knowledge organized in illness scripts is that it can be accessed very quickly and be flexibly adapted to new situations, whereas knowledge organized in conceptual networks has to be reasoned through step by step. In medicine there is an amount of evidence that can be interpreted in accordance with the notion of illness script formation. It is contended that this "novice-to-expert learning process is a prototype" that also can be found in other domains (Boshuizen, 2003, p. 12).

For several reasons it is plausible to assume, that this holds true for counseling domains and that here similar learning processes take place. This proposition is based on similarities as to (1) the education and training of counselors and the respective learning processes, (2) characteristics of the domain and (3) on findings on characteristics of experienced counselors and therapists.

(1) Similar as in medicine the training of counseling psychologists consists of a mix of formal education and practical experience. Conceptual and experiential forms of learning play a major role in both domains. Clinical experience enables practitioners to perceive relevant aspects more easily. Recognizing and differentiating patterns of

test results etc. is an obvious example for this kind of perceptual learning; less obvious is the learning of typical (perceivable) manifestations of certain disorders, that is learning of the typical appearance of specific clients. For example there are certain non-verbal cues like specific facial expressions or the sound of the voice that characterize depressive people; or think of an "secret drinker" whose appearance may be characterized by yellowish eyes and skin, trembling hands and a specific smell (a smell the client often tries to hide by the extensive use of after-shave or perfumes). Such complex patterns and stimulus configurations can hardly be formalized and are often learned in a more implicit way in clinical practice. Similarities can (2) also be stated as to certain characteristics of the two domains. Physicians and counselors alike are confronted with people and their complex problems. Diagnosing the underlying causes and conditions of the problems is a crucial step in helping patients and clients. In counseling, the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV TR) is a common tool for diagnosis and treatment planning (Gladding, 2004; Seligman, 2004). The DSM is compatible with the International Classification of Diseases (ICD 10). Formats for conceptualizing cases in counseling reveal categories that are similar to the illness script components (e. g. "Case Formulation Content Coding Manual" by Eells, Kendjelic, & Lucas, 1998).(3) Different findings on characteristics of experienced counselors and therapists hint to the existence of knowledge structures that resemble illness scripts. There are findings that indicate that experienced counselors process information more automatically and selectively than novices and that they are able to perceive more relevant aspects of a case (Caspar et al., 2004; Strasser, Geissler, & Kronawitter, 2005). To investigate more specifically if the notion of illness script formation is applicable for the domain of counseling, certain assumptions of this concept are to be made explicit.

Assumptions and implications

Explicitly the theory of knowledge encapsulation and illness script formation assumes that experts' reasoning is based on illness scripts while less experienced subjects have to rely on more or less integrated conceptual networks. Thus, it is

expected that less experienced individuals produce mainly fault-related information while experts reveal more enabling conditions and consequences when reasoning about a case. Less explicitly the illness script concept implies further assumptions. Formulating the latter in a general way helps to transfer this concept to other professional domains. The following assumptions are associated with the notion of illness script formation as learning process during professional development.

(1) Illness script formation is a process that primarily is initiated in the transition from formal training to clinical practice. Thus, the intermediate stage is a critical phase as the emerging knowledge structures are not yet stable and fixed and the contextual information is not yet fully integrated.

(2) As the illness scripts of intermediates are still "fragile", they often fail to activate their knowledge structures as a whole. Thus, intermediates actively have to elaborate the relations between the single components of the emerging illness scripts. They have to switch between reasoning based on concepts and reasoning based on illness scripts. Therefore, intermediates' process of knowledge application takes longer and is more explicative.

(3) The formation of illness scripts is based on experience and the generalization of experience; as intermediates are at the beginning of generalization, they try to adapt their knowledge structures to their actual experiences.

(4) Fundamental, theory-based knowledge does not disappear during illness script formation, but gets encapsulated and integrated into experience based knowledge structures. Thus, it is still available if needed.

(5) Illness script formation is a process of progressive integration of contextual information. This not only helps to activate relevant knowledge about certain diseases immediately, but also to recognize and perceive similarities and differences between the phenomena in one's clinical practice. Thus, connections and relation between different diseases are also perceived more easily.

These assumptions were examined as to their transferability to the domain of counseling by a prompting task, in which counselors were confronted with different categories of client problems.

Method

Sample

Subjects were counselors at different levels of experience ($n=31$), with age ranging from 22 to 60 years ($M=39.1$; $SD=10.9$) and experience ranging from six weeks to 33 years of experience ($M=8.8$; $SD= 9.6$). Three groups were differentiated. These were novices (less than two years of professional experience), intermediates (more than two and less than ten years), and experts (more than ten years). All participants worked or had experience in the domain of child guidance, working at different counseling centers all over southern Germany.

Material

The stimulus material consisted of 20 names of typical problems and difficulties of clients in the domain. The problems were selected to display (1) relevance as to the specific counseling domain, (2) substantial variance in seriousness of the problem, (3) and in frequency of occurrence in counseling practice. (4) Additionally all problems should be describable by some sort of codified knowledge, by theoretical concepts and not only by practical experience. To assure this we referred to the documented statistics of the counseling centers and to the results of a pre-study. The following problems were presented: suicidal attempt, depressive mood, anorexia, hyperactivity, autoaggressive behavior, social anxiety, learning disability, enuresis, parental divorce, aggressive behavior, generalized anxiety, insomnia, disobedience, substance abuse, mental retardation, sexual abuse, lack of self esteem, lack of learning motivation, specific phobia and body dysmorphic disorder.

Procedure

In a prompting task the subjects were confronted with these clients' difficulties. The labels of the different problems were presented to participants on a laptop screen in a subsequent manner. The sequence of the names was randomly varied to avoid order effects. Subjects were asked to explain the problems; they were instructed to tell everything they knew about it and that came to their mind. After each label, subjects had to rate their actual experience with these problems. A pre-study showed, that the instruction was understood well. To avoid misunderstandings some of the problems were announced with its official name and a more colloquial expression. Participants were tested individually at their workplaces. All narratives were recorded digitally on the laptop; there were no time constraints on the duration of either the entire session or the individual problem description. Think-aloud protocols were produced by transcribing the recordings literally.

Measures

In designing the study, it was tried to cover both the explicit and the implicit assumptions underlying the notion of illness script formation. Explicitly research on illness script formation is concerned with the components of illness scripts (enabling conditions, fault, consequences) and the overall amount of knowledge. To test whether groups with different amount of experience and practice differ as to the structure of their knowledge, the quantitative occurrence of these aspects in the think-aloud protocols is investigated. Differences between the groups as to these aspects are interpreted as differences in underlying knowledge structures. In illness script research the protocols are analyzed applying the following procedure. Protocols are segmented into statements or propositions, these segments are coded as "enabling conditions", "fault", "consequences" or "irrelevant", finally the codes and the respective statements are counted. The total sum of statements is interpreted as indication for the overall amount of knowledge (Custers et al., 1998). To obtain results that are comparable to the findings of existing illness script literature, the same procedure was used. The category system was extended, however, to investigate the more implicit aspects of the illness script concept.

Those aspects that have not been considered explicitly so far, may account for the substantial proportion of text segments that for example Custers et al. (1998) had to subsume under the rest-category. Therefore the following extensions were made. First the "fault"-category was differentiated. The basic idea of illness script formation is, that basic declarative knowledge gets encapsulated. In medicine this knowledge is causal and can clearly be discerned. In counseling this is more difficult. Therefore "fault" or basic knowledge was operationalized by two measures, number of theoretical concepts and number of explicative statements. To account for the assumed progressive coherence and integration of the knowledge structures, connections that subjects perceived between the presented problems were identified. The assumption that clinical experience gets more and more generalized was tested by a look at the amount of generalized case information provided by the subjects. On the other hand, intermediates' clinging to actual experiences was assessed by the amount of subjects' reference to recent cases.

The recordings of the subjects' measures were investigated as to the following aspects.

Duration of the session. This measure delivers a first hint as to the amount of the reported knowledge and the extent of the knowledge structures' integration.

Number of statements (protocol length). The total number of statements a subject produced was identified.

Number of theoretical concepts. How many theory-based concepts are identified in the protocols, is counted hereby.

Number of explicative statements. Statements were counted with which subjects defined and explained the single problem categories "theoretically".

Number of recent cases. Does the counselor refer to a case she/he is still dealing with or she/he has just completed, is assessed hereby.

Number of generalized cases. Whenever subjects did not describe single cases but referred to some sort of "summarized" cases, this was counted as generalized case.

Descriptions of generalized cases had to contain the typical features and the probable course a case may take to be counted. As measure for the extent of generalized case description additionally the *number of generalized case statements* was counted.

Experience-based connections. Hereby it is assessed, how many connections between the single problems subjects produce. Connections are counted that are not made for theoretical reasons, but that are based on the subject's experience. This is measure for perceived interrelations between the single problem categories.

Theory-based connections. When a subject, while confronted with a certain problem category, mentioned one of the other problem categories for conceptual reasons, this was assessed as theory-based connection.

Number of "enabling conditions". Statements containing information on contextual background factors (such as characteristics of the environment, living conditions, sex, age and habits of clients) that are associated with the emergence of certain psychological problems were categorized as "enabling conditions".

Number of "consequences". Whenever subjects described the appearance of clients, signs and symptoms of specific problems and disorders, this was counted as "consequence".

Hypotheses

The measures were expected to reveal the following group-specific differences.

- (1) As intermediates have not yet full-fledged illness scripts, they are expected to have the longest duration and the highest number of statements.
- (2) Intermediates will make more explicative statements as they actively have to elaborate on their knowledge base and to produce the relations between their fundamental and their experiential knowledge.
- (3) As fundamental (theory-based) knowledge remains accessible, there are no differences as to the number of theoretical concepts.

- (4) Intermediates refer to more recent cases than experts and novices, as they are trying to apply their theoretical knowledge to their actual experiences.
- (5) On the other hand experts will refer more often to generalized cases, as their illness scripts easily provide generalized case information.
- (6) As the counselors' knowledge base gets more integrated in the course of their professional career, experts will perceive more interrelations and cross-connections between problem categories and therefore connect the single problems to each other based on their experience.
- (7) The more experienced the subject, the more she / he will provide information on enabling conditions and consequences of specific disorders as experience with "real" clients helps to integrate this kind of information.

Analysis

Group differences were tested for significance using analyses of variance and a posteriori Duncan tests. Effect sizes (eta squared, η^2) were calculated for all effects; effects were regarded as small when $\eta^2 < 0.06$, as medium when $0.06 < \eta^2 < 0.14$ and as large when $\eta^2 > 0.14$.

Results

Table 1 shows the differences between the three groups of counselors resulting from one-way analyses of variance.

A test of gender effects showed independence except for "experience-based connections", for which gender influence was statistically controlled.

Table 1

Means (standard deviations in brackets) of all dependent variables, reported separately for novices, intermediates, and experts. Results of analyses of variance (oneway): F scores, degrees of freedom $df=(2, 28)$ for all tests, mean standard error (MSE). Results of Duncan post hoc-tests (1=novices, 2=intermediates, 3=experts). +: $p<.10$; *: $p<.05$; **: $p<.01$; ***: $p<.001$

Variable	Mean (standard deviation)			F	MSE	Duncan	η^2
	Novices	Inter- mediates	Experts				
Duration of session (min:sec)	32:06 (14:03)	52:01 (17:58)	59:30 (16:25)	7.58**	3:30	1<2,3	0.35
Statements	367.0 (231.9)	756.2 (309.4)	869.6 (489.5)	5.44**	73.3	1<2,3	0.28
Theoretical concepts	11.3 (9.8)	13.0 (6.9)	8.9 (8.7)	0.84	1.29	-	0.06
Explicative statements	53.1 (53.7)	4.4 (4.7)	4.4 (4.2)	8.54***	6.75	1>2,3	0.38
Recent cases	0.7 (0.7)	2.6 (3.2)	0.3 (0.7)	3.78*	0.39	1,3<2	0.21
Generalized cases	0.9 (1.6)	6.8 (4.1)	14.6 (4.3)	37.47** *	1.18	1<2<3	0.73
Generalized case statements	6.0 (9.5)	49.4 (34.2)	156.7 (73.6)	27.59** *	13.99	1<2<3	0.66
Experience-based connections	1.3 (1.6)	6.6 (4.1)	10.8 (3.7)	20.43** *	0.91	1<2<3	0.59
Theory-based connections	4.6 (3.4)	3.4 (2.4)	2.0 (1.5)	2.62+	0.48	1>3	0.16
Enabling conditions	6.3 (8.4)	18.8 (12.0)	56.6 (90.0)	2.57+	9.77	1<3	0.16
Consequences	42.5 (52.7)	107.8 (80.0)	137.1 (100.5)	3.66*	15.62	1<3	0.21

The analysis of variance revealed the following group specific differences. The duration of sessions was significantly shortest for the novices, which means, that experienced counselors, intermediates and experts needed more time. This difference also showed up as to the protocol length, assessed by the number of statements. The longest protocols are produced by the experts. As predicted no significant differences as to the number of theoretical concepts were found, whereas the groups differed significantly as to the number of explicative statements. Unexpectedly novices explained most. There was also a significant difference as to the reference to recent cases; intermediates referred to their recent experiences more often. A significant difference between all three groups was found as to the number of generalized cases and also as to the number of generalized case statements. Experts presented the highest proportion of generalized case information. The number of experience-based connections significantly differed between all three groups, the experts making the most connections followed by the intermediates. On the other hand, there were no significant differences as to theory based connections, the post hoc test reveals only a tendency that novices make more theory based connections. Due to a considerable amount of variance in the expert subjects' protocols only a tendency as to the number of enabling conditions mentioned was found. Experts reported more enabling conditions than novices. The difference in the number of statements related to consequences was significant. Again experts referred to that kind of information more often than novices. The calculated effect sizes indicated large effects for all significant differences.

Discussion

Although not every assumption could be confirmed (e. g. no intermediate effect as to protocol length; highest number of explicative statements in the novice group), the results indicate that during the professional development of counselors knowledge structures emerge that are in some aspects similar to those found in physicians. This knowledge structures integrate fundamental and experiential

knowledge. According to the assumptions derived from illness script theory expert counselors' knowledge seems to be organized in some sort of scripts. While novices tend to report fundamental knowledge by reasoning through detailed conceptual networks, intermediates often refer to concrete cases, mainly cases they recently encountered; the formation of scripts is most advanced in the expert group, thus they present mainly generalized case information. The lack of significant differences as to the number of theoretical concepts indicates that fundamental knowledge is still present, although encapsulated and supplemented by contextual information. It still has to be explained, why intermediates and experts do not differ more distinctly as to duration of sessions and number of statements. Following the illness script theory intermediates are expected to need the most time and to produce the highest number of statements, as their knowledge base is not yet coherently structured (and they shift between fundamental and experiential knowledge). Obviously experts produce not only fundamental and context/consequence-related statements. What additional information this could be is suggested by the significant differences as to the experience-based connections; increasing experience helps to recognize cross-connections and inter-relations between the different problem categories. In contrast to medicine psychological problems are not as distinct as diseases and there is not a single underlying malfunctioning. The effect of experience on expert knowledge thus can be seen in an increasing over-lapping of concepts. This development is probably due to an increasing reflection of one's experiences. It is supposed that the integrated knowledge base allows experienced counselors to take a meta-perspective and to reflect extensively upon their work and the different (including personal) conditions for its outcomes, as self-reflection is of special relevance in psychological counseling. This supposition yet still has to be corroborated.

Two major limitations of the transferability of the illness script concept have to be discussed. The first limitation pertains to the structure of the domain-specific knowledge. Biomedical knowledge about pathophysiological malfunctioning (the fault) is structured in a way that it can be represented in causal networks. The

underlying disturbed body functions can be clearly connected to certain manifestations of an illness. The problems and "disorders" clients present to psychological counselors, however, are less clearly defined than a heart attack or a broken leg. Although there is an increasing body of knowledge about the emergence, prevalence and dynamics of specific disorders, there are still conflicting explanations and differing theoretical approaches to them. Thus, the main important classification system of mental disorders, the DSM-IV, is basically descriptive and avoids speculation on etiology. Disorders and problems of clients are socially constructed and therefore more "fuzzy". Hence generating diagnoses is a more difficult and preliminary process. Furthermore, the problems psychological counselors have to work with can not always be classified according to DSM-IV categories. Even if the main problem of the client represents a psychological disorder according to DSM-IV, this diagnosis does not exclusively determine the counselors behavior. This leads to the second limitation of the illness script concept, the difference as to the nature of physicians' and counselors' activities. Diagnosing diseases holds a central position in medical practice. Medical treatment follows almost automatically from an accurate diagnosis. Diagnosis and treatment involve merely few social and interactive aspects (physicians may even diagnose a case without seeing the actual person, but merely referring to the lab data). Diagnosing must not be neglected in psychological counseling either, but it forms only the starting point for a often long-term counseling process. The counselor as an individual person is an integral part of that counseling process. Trying to offer a helpful relationship is in many cases a highly demanding enterprise related not only to cognitive but also to emotional and interpersonal aspects. Illness scripts do not represent these aspects, e. g. they lack slots for actors and the social roles and goals of actors. In the counseling process the counselor has not only to observe what follows from the diagnosed "disorder". Rarely clients present a single, diagnosable disorder, but many more or less severe problems that are interrelated. In counseling the counselor has to take these further problems into account as well as the resources of the client, his/her personal prerequisites as well as the constraints of his counseling approach, etc. Thus, her/his work is not done with diagnosing a

certain disorder, furthermore he has to conceptualize often highly specific cases and to adapt that conceptualization according to the new information he gets in every single counseling session. It is plausible to assume that counselors' knowledge structures are not merely centered around disorders, as the notion of illness scripts suggests; with increasing experience the counseling specific demands and aspects may be more and more associated with typical clients' problems and they may get more and more integrated into and represented by the counselors' professional knowledge. This would account for the higher "extent of knowledge" in our expert group. It has to be noted, though, that illness script formation is only one (and not the final one) stage in the development of physicians' knowledge structure (Boshuizen, 2003; Schmidt et al., 1992). A script provides a "template", that shapes the clinicians' accumulated knowledge. The more personally relevant experiences with real cases the practitioner encounters, the more narratively enriched gets his / her script. Highly specific, idiosyncratic structures emerge that incorporate a wide range of variation from the script (Gruber, 1999; Kolodner, 1993). This stage may be of special relevance for the development of counselors; but it is only reached after gathering extensive experience; no wonder, that a personal style in counseling and emerges not before 15 years of practice (Skovholt & Jennings, 2004).

The results may promote the discussion on the nature and function of learning processes during the professional development of counselors. They also imply consequences for designing training programs. In counselor training often technical rather than conceptual skills are emphasized (Seligman, 2004), but effective counseling requires competence in both conceptual and technical skills. Therefore training programs have to take into account cognitive prerequisites of effective counseling. Only high-level cognitive functioning allows counselors to perform the multiple tasks of their practice: comprehending and organizing a range of facts, integrating and synthesizing information as well as determining similarities and differences (Granello, 2000). Thus, in accordance with Fong, Borders, Ethington, and Pitts (1997) it is suggested that training programs "emphasize student cognitive development as strongly as skills development (p. 100)". This premises insight into

the emergence and development of practitioners' knowledge structures. The concept of script formation provides a framework for research on professionals' cognitive development and delivers hints as to possible learning trajectories. To foster this learning process, training programs not only have to provide a coherent knowledge base but also opportunities for students to meaningfully apply that knowledge in different counseling settings. Thereby clinical training is to "focus more on increasing students' levels of cognitive complexity" (Whiston & Coker, 2000, p. 233). This allows students to make sense of their practical experiences and integrate their experiences and knowledge coherently.

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