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Interest and human development: An educational-psychological perspective

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Hardly any other research field in the domain of educational psychology has received so much attention in the past few years than motivation and its role in academic learning (Boekaerts, Pintrich, & Zeidner, 2000; Efklides, Kuhl, & Sorrentino, 2001; Sansone & Harackiewicz, 2000; Volet & Järvelä, 2001; Wigfield & Eccles, 2002). Similar to other fast-growing research fields, many new concepts and ideas have been developed that dominate the actual scientific discussion. However, it is questionable whether or not these new concepts have a significant impact on the educational discourse in everyday practice. By contrast, the traditional concept of interest holds a central position in educational thinking and acting. Educational laymen (e.g. parents) as well as professional educators (e.g. teachers, trainers) often use arguments with interest topics when they think about the motivational prerequisites for teaching and learning or about students' more or less successful development processes. Furthermore, educators agree that the differentiation and stabilization of interests relevant to learning are an important goal of education (H. Schiefele, 1978, 1981).

In view of the extraordinary importance of interest related argument patterns within the educational context, it is to be expected that the interest construct and theories about the development of interests and how they work is an important field of educational psychology. At the beginning of empirical scientific psychology in the late 19th century this was actually the case. Famous psychologists advocated that interests were the most important motivational factors in learning and development (Claparède, 1905; Dewey, 1913; Thorndike, 1935; for a summary, see Arnold, 1906; Berlyne, 1949; Prenzel, 1998). Later the interest concept was pushed into the background as first behaviourism, and later the shift towards cognitive approaches in psychology brought forth numerous new concepts related to motivated learning (H. Heckhausen, 1991;

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Prenzel, 1988). As a result, the inclusive theories on interest have been excluded from scientific discussion in the field of educational-psychological research on learning and development.

It was only in the late 1970s that there was a re-awaking of interest research, when the realization prevailed in various areas of research that important aspects of learning motivation which are circumscribed in traditional thinking about interest cannot adequately be reconstructed with the theoretical concepts that have been most popular in modern (cognitive) motivation research. Without going into detail about the background and the course of scientific debates (see Krapp, 2000, 2002a; Prenzel, 1988), I would like to point out that researchers from psychology as well as educational science were involved in this development, and there was fruitful exchange from the beginning (Hoffmann, Krapp, Renninger, & Baumert, 1998; Lehrke, Hoffmann, & Gardner, 1985; Renninger, Hidi, & Krapp, 1992).

In the meantime, it may be asserted that interest research has become considerably more influential within educational psychology. Today the interest construct represents successfully applied theoretical concept in many areas of research (see Hidi, 1990; Hoffmann et al., 1998; Krapp & Prenzel, 1992; Renninger et al., 1992; Schiefele & Wild, 2000, for an overview). Recent educational psychology interest research has admittedly concentrated on studying the relationship between interest, learning and achievement (Baumert & Koller, 1998; Krapp, Hidi, & Renninger, 1992; Krapp & Prenzel, 1992; Prenzel, 1998. Renninger, 1998; Schiefele, 1999, 2001; Schiefele, Krapp, & Winteler, 1992). Developmental studies have been concerned with the description of the development of interests in the early years (elementary school, pre-school, e.g. Fink, 1991; Renninger, 1989, 1990) or the exploration of general developmental trends in certain student population with respect to certain school subjects or learning contents. Just as in other areas of motivation research, interest research has only touched on the reciprocal relationships of motivation and personality development from a life-span perspective. In psychological motivation research, there appears to be a kind of reversal of the trend (see Heckhausen, 2000). From my point of view, educational psychology should also be called upon to pay more attention to this field (e.g. Wigfield & Eccles, 2002).

The ideas presented here are in the tradition of a theoretical approach developed by Hans Schiefele and associates for an 'educational theory of interest' (H. Schiefele, Krapp, Prenzel, Heiland, & Kasten, 1983). It was supplemented and partially revised in certain subareas (see Krapp, 1992; Prenzel, 1988, 1992; U. Schiefele, 1991, 1996). Using the keywords 'person object theory' I have attempted to summarize the current state of theory development and to specify statements derived from this theoretical conception (see Krapp, 1999a, 2000, 2002a).

In the following I first give an outline of the interest construct, from the perspective of a person object theory of interest (POI). The main part deals with the question of how interests develop. Here, both descriptive and explanatory aspects will be discussed. In the final section, I also present some considerations and hypothetical statements about the interrelations between interest and personality development.

The person-object approach to interest

Most researchers interpret interest as a more or less enduring specific relationship between a person and an object of his or her 'life-space' (Lewin, 1936). Interests are

always directed towards a certain object. Content specificity is, thus, a main criterion of this concept. In this respect it differs considerably from the concept of attitude or the numerous concepts that operate under the term motivational orientation. There is, however, conceptual overlapping, as theories about motivational goals or self-efficacy now also recognize the idea of domain specificity (Bandura, 1997, 2001; Pintrich, 2000, 2003).

In conceptions of personality theory, a person's individual interests have the status of more or less lasting motivational dispositions, whereby the main interests especially reflect the components of the constantly changing 'self-system'. This at least is the view of the interest conception described below. An individual's actual pattern of interests is closely related to what in other theories are called personal goals (Sheldon & Elliot, 1998, see also Boekaerts, 2003), personal strivings (Emmons, 1991), content-specific task-value beliefs (Pintrich & Schunk, 1996), or motivational aspects of a person's meaning system (Dweck, 2003). Interests can be activated in specific teaching/learning situations and have then—in addition to other factors and personality structures important for motivation—an influence on the intensity and quality of the current learning motivation. It is not possible to delimit all of the variations of the interest concept that are currently to be found in scientific discussions completely from other motivational concepts. A sufficiently clear differentiation can be made only on the basis of an explicit theoretical model. In the 'person-object conception of interest' (POI) described here, an attempt was made to develop an interest theory which was explicitly oriented to the demands of educational practice and in this connection also offered a chance to reconstruct what happens motivationally from a development theory perspective.

Superordinate goah and theoretical statements

POI includes metatheoretical considerations about the domain of theoretical explanation and about an appropriate theoretical framework1 that rightly deals with the general (theoretical and/or practical) goals of the theory. POI does not claim to be able to make a statement about all the facts that can be circumscribed by the everyday concept of interest. Its universe of discourse is limited to those phenomena that are directly or indirectly connected to learning and development. An important aspect is its usefulness for—or at least the compatibility with—the central problems discussed in the field of educational theory and practice.

A further aspect is object specificity. Since education is normative, an educator or teacher has to take into account which contents or objects are chosen for teaching and learning and what the long-term goals of development are to be. A theory of interest which takes educational demands into consideration should, thus, state how contextual preferences develop and what the conditions are for a learner to have a more or less lasting interest in certain subjects or contents and to be ambivalent about others or even develop an aversion. It is also important that the theory is open to this kind of question and offers psychological explanations for the processes and developments connected with it.

[1] *In POI, the terms 'framework' and 'frame conception' are used in a somewhat different way than in the context of certain metatheoretical discussions (e.g. Fodor, 1983, 2000). Although a theoretical framework or frame-conception is understood as the ensemble of overarching and more general statements of the theory, such as the ultimate theoretical and practical goals, it does not necessarily imply that every theoretical statement must be in congruence with the statements in the frame concept.*

Theoretical frame conception

Every theory is based on a commitment to a certain research paradigm and a theoretical frame conception corresponding to this paradigm. The practice of researchers is such that these decisions are very seldom made explicitly. Often the followers of a certain theory do not think about it because they simply attach themselves to it without metatheoretical reflection of a currently generally accepted way of thinking or theory. Since the so-called cognitive shift in psychology, concepts and theories predominate in educational-psychological motivation research that are based on a cognitive oriented action-theoretical frame, mostly concretized in some form (or aspect) of the general expectancy-value model, (see Eccles, 1983; Pintrich & Schunk, 1996). Theories derived from cognitive models have shortcomings with respect to their educational use, and these shortcomings are an even more important problem when describing and explaining the role of motivational factors in the course of human development during the life span. For example, action-theoretical approaches do not provide adequate concepts and models for describing the dynamic structure of personality or important developmental aspects, such as identity formation and the related ongoing changes in the self-system of the growing personality. Furthermore, they have to struggle with the problem of how to take emotional experiences into account, or how to consider processes that appear to have an effect mainly at a subconscious level of action control. We have, therefore, chosen a theoretical frame which tries to reconstruct motivational structures and processes from a more general system-oriented ('systemic') perspective. Referring to early conceptions of motivation and interest from Dewey (1913), Kerschensteiner (1922), and others, who emphasized that interest should be interpreted not only as a characteristic of a person, but as a specific 'relationship' between the person and the object of his or her interest, our approach is also theoretically based on a person-object conception. The special quality of the relationship between person and object should be made at the beginning of the theoretical explication of the interest construct. Thus, at the first definition level, an interest can be characterized as a specific 'person-object relationship' (PO relationship).

In accordance with the ideas of Lewin (1936), Nuttin (1984), Deci and Ryan (1985, 1991) and many others, it is postulated that the individual, as a potential source of action, and the environment as the object of action, are constituted by a bipolar relation. [2] Consequently, the interest construct is conceptualized as a relational concept: an interest represents a more or less enduring specific relationship between a person and an object in his or her 'life-space' (Lewin, 1936).

Objects of interest

As a result of the ongoing interactions between person and environment, it is assumed that the person builds up a representation system that consists of cognitive and non-cognitive entities or components. It is further assumed that an individual experiences and represents his or her environment in a meaningful structure. The cognitively represented environment consists of units that are separated from one another to a greater or lesser extent. POI refers to these units as 'objects'. Under certain conditions, which will be spoken of later, every cognitively represented area of the environment can become the object of interest. It is important to point out that the POI uses a

[2] *Mark Bickhard (2003) provides a much more differentiated and rather rigorous theoretical position ('interactivism') that is in some respect also based on this core idea.*

relatively broad concept of object: an object of interest can refer to concrete things, a topic, subject matter, an abstract idea, or any other content of the cognitively represented 'life-space' (Lewin, 1936). Smith (2002a, 2002b) has pointed out that Piaget's epistemic model, especially his concept of developmental levels, provides an appropriate theoretical reconstruction of the sequence from actual to abstract objects. The advance from concrete to abstract is neither easy nor straightforward during the development of the child. It must be noted that the person himself or herself also represents an area of the real world, and thus able to refer an interest to facts which concern one's own person (e.g. expansion and critical reflection of self-perception in therapy).

The object of interest is represented in the person's mental system as a subjective construct. This, however, does not necessarily imply that the object of interest will be represented idiosyncratically. Perceptions of an object and object-related evaluations are influenced by the social context, i.e. by socially shared thoughts and norms (Valsiner, 1992). Thus, object-related knowledge is to some extent shared, exhibiting a certain degree of objectivity in the sense that an inter-subjective consensus can be found with regard to its meaning and can provide a basis for social communication about it.

In the course of development during a lifetime, the structure and the dynamics of interests change due to factors that will be studied more closely later. Furthermore, it must be realized that the functional property of a certain interest is determined not only by the specific qualities of the person-object relationship in question but also by how this interest is embedded in the entire spectrum of interests that are represented in specific structures of the memory system ('self-system'; see below).

Two levels of analysis

Conceptualizing interest as an interactive relation between an individual and certain aspects of his/her life-space makes it possible to study the conditions for or and effects of, interest from various research perspectives as well as from different analytic levels.

At the first level, research is concerned with the processes and states that are relevant during concrete interactions between a person and his or her object of interest. In this case, the analysis focuses on the description and explanation of interest-triggered actions. The realization of an interest requires a situation-specific interaction between the person and the object. The term object engagement is used to indicate such an interaction at the most general level (Prenzel, 1988, 1992). An interest-related motivational state or process has usually been characterized as intrinsic, and the experience of realizing a personal interest is often equated with intrinsic motivation (see, for example, the various chapters in Sansone and Harackiewicz, 2000 and Deci and Ryan, 2002).[3]

On a second level, interest refers to the dispositional (or 'habitual') structure of an individual. Here, interest is interpreted as a relatively stable tendency to occupy oneself with an object of interest. It is seen as a more or less lasting motivational characteristic of the person. In accordance with other interest researchers (e.g. Renninger, 1990, 1992, 2000) the concept *'individual interest'* is used to signify this level of conceptualization.

[3] *Nevertheless, the theoretical relation between these two concepts is far from being clear (see, for example, Hidi, 2000; Krapp, 1999b; Murphy & Alexander, 2000; Pintrich & Schunk, 1996; Renninger, 2000; Schiefele, 1996).*

I think it is very important to make a clear distinction between these two levels of analysis because they refer to rather different research paradigms, including different directions of research questions, methodological approaches and practical implications. At the first analytic level, research is concerned with processes and functional relationships that, in principle, hold true for every individual. This is the classical approach of general (experimental) psychology. The second analytic level interprets psychological phenomena such as motivation from the perspective of personality psychology. In this tradition of psychological theorizing, processes have become substances (see Bickhard, 2003) in the sense of more less stable personality structures such as 'traits' or 'orientations'. Research that is based on the paradigm of 'differential psychology' (Anastasi, 1958; Asendorpf, 1991) is first of all interested in measuring individual characteristics on the basis of existing (stable) differences between individuals and in describing and 'explaining' the emergence and effects of these differences including the prediction of future differences in practically relevant aspects of behaviour (e.g. academic achievement). Most research in this tradition is 'correlational', that is to say that empirical relations are explored by statistical techniques that allow for an estimation of 'explained' variance. Although there has been long-standing discussion about these 'two disciplines of scientific psychology' (Cronbach, 1957, 1975) and a shared belief among psychological researchers, many authors in our domain seem not to be aware of the metatheoretical and methodological problems that derive from this distinction. In reviews about the role of motivational factors (e.g. goal orientation; Elliott & Dweck, 1988; Pintrich, 2000) in teaching and learning, it is rather common to refer to both experimental and correlational findings. The only difference between the kind of information gained with these methods that is regularly mentioned is the problem of presumed ecological validity. In this respect, findings from correlational studies which are often (incorrectly) equated with 'field studies' are rated higher than results from experimental studies and therefore are interpreted as more relevant for educational practice. The much more severe and far-reaching problem—that the results eventually represent totally different information which cannot be directly compared—is hardly ever discussed.[4]

The attempt to draw a clear distinction between dispositional and situational (process-oriented) theories and research strategies in the field of motivation is certainly not new. It can be easily traced back to well-known theories of achievement motivation (Atkinson, 1964; Atkinson & Raynor, 1974, 1978; see also H. Heckhausen, 1991) but the core idea and the related scientific problems have already been discussed in the earliest psychological theories on personality and motivation (e.g. Allport, 1937; Dewey, 1913; Stern, 1918).

From a development theory perspective, both levels of analysis are important. At the first level, the processes primarily studied are those responsible for the dynamics of the developmental course, whereby it is attempted, for instance, to identify the formation of new interests or the changes in already existing ones. At the second level of analysis, interest research deals with the 'crystallized' results or effects of the developmental processes. Here it is a matter of analysing ontogenetic developmental processes by means of infra-individual or inter-individual comparative studies over time as well as the identification of influential factors responsible for these developmental processes.

[4] *A related problem refers to the question what kind of information we get in developmental research approaches that use measures of motivational dispositions and explore developmental trajectories on the basis of correlational techniques (Valsiner, 1986).*

Characteristics of an interest-specific person-object relationship

Interpreting interest as a content-specific concept fits well with modern theories on knowledge acquisition and instruction in so far as knowledge is always structured and acquired in particular domains. In addition, formal criteria have to be taken into consideration. They refer to cognitive aspects, emotional and value-related components of interest-based activities (see Krapp, 2002a, for a more detailed discussion).

It is assumed that an interest develops and the structural components change with respect to both cognitive and emotional representations. Thus, a well-developed interest differs from an interest at its earlier stages. There is ample empirical evidence for the assumption that a person's cognitive structure related to the knowledge domain of an established individual interest is highly differentiated and shows many connections to other cognitive domains (Krapp, 1992; Renninger, 1990, 2000). Furthermore, an interest is closely connected with cognitive processes of change. A person who is interested in a certain subject area is not content with his or her current level of knowledge or abilities in that interest domain. Rather, there is a high readiness to acquire new information, to assume new knowledge, and to enlarge the competencies related to this domain. But there is also a high readiness for activating (using) interest-related competencies in situations that do not require new learning. Based on Piaget's (1985) notion that interest is aimed both at expanding knowledge and skills (accommodation) and at applying existing knowledge and skills in new situations (assimilation), one could interpret an interest-based activity as a combination of two closely interrelated processes. One is primarily concerned with the acquirement of new interest-related knowledge and competencies (e.g. phases of deliberate intentional learning in school); the other is primarily concerned with the enrichment of the 'treasure trove' of interest-based experiences, for example when realizing an interest in well-known situations without an explicit intention to enlarge the existing pattern knowledge and competencies. Nevertheless, it is possible that the individual learns something new without being aware of the occurrence of cognitive growth.5 In both cases, the person must have a metacognitive knowledge about things he or she does not know yet and situations that provide an opportunity to apply his or her actual interests. Thus, POI assumes that the knowledge structure concerning the object domain of an individual interest also contains more or less differentiated knowledge about future opportunities for learning and development (Prenzel, 1988). At the same time, the trend to further develop and improve the pattern of interest-related competencies is an essential indicator for the current dynamics and liveliness of a certain interest.

A central criterion of the interest construct is the close combination of value-oriented and emotional components. POI assumes that a person shows a high subjective esteem for the objects and actions in his or her areas of interest. These have the quality of *personal significance*. In accordance with earlier as well as more recent theories, POI assumes that the person's individual interests are closely related to his or her self-system (see Deci & Ryan, 1985; Fend, 1991, 1994; Hannover, 1997, 1998; Kuhl, 2000, 2001; Sheldon & Elliot, 1998). From such a theoretical perspective, positive evaluation results from the degree of identification with the object of interest. In POI, the value component of an interest is also referred to by using the concept of 'self-intentionality' to make it clear that the goals and volitionally realized intentions related to the object

[5] *There is a growing body of research in different fields of psychology that is concerned with this kind of implicit learning (e.g. Lewicki, Hill & Czyzemska, 1992; Reber, 1989; Sun, 2002).*

area of an interest are compatible with the attitudes, expectations, values and other aspects of the self-system.

The global characterization that an interest-based action is accompanied by mostly positive emotional experiences has to be specified with respect to qualitative criteria. Considering models and empirical results from other fields of psychological research, it has been suggested that tension, in the sense of an optimal level of arousal and feelings of enjoyment, involvement and stimulation, is the most typical emotional aspect of an interest-based activity (Prenzel. 1988; U. Schiefele, 1991). Referring to 'Self-Determination Theory' (SDT; Deci & Ryan, 1985, 2002; Ryan, 1995), I have proposed considering emotional experiences that are related to the 'basic needs' for competence, autonomy and social relatedness in order to characterize interest-specific emotional experiences (Krapp, 1998, 1999a, 2002a). Under extremely congenial conditions, flow may be experienced (Csikszentmihalyi, 1990; Csikszentmihalyi & Csikszentmihalyi, 1988). In a person's cognitive-emotional representation system, experiences that precede, accompany or follow an interest-triggered activity are stored in their specific quality for a longer period of time and can to some degree be remembered as positive 'feeling-related valences' (U. Schiefele, 1992, 1996). But one has also take into account that important and rather influential components of these representation are not accessible to our conscious-cognitive information-processing system.

The assumption that an interest is characterized by optimal experiential modes with respect to personal involvement and emotional feedback during a sequence of interest-based activities is quite close to the concept of 'undivided interest' or 'serious play' which is used by Rathunde (1993, 1998) and Rathunde and Csikszentmihalyi (1993) to describe an optimal mode of task engagement. John Dewey (1913) had already used the notion of interest as an 'undivided activity' in which no contradiction is experienced between the assessment of personal importance of an action and positive emotional evaluations of the activity itself. There is no gap between what a person has to do in a specific situation, and what the person wants (or likes) to do.

Interest development from an ontogenetic perspective

An ontogenetic theory of interest development—like every other theory—has to be both *descriptive and explanatory*. On the one hand, it has to provide concepts, models and results that can be used to describe individual and/or general developmental changes with respect to both the whole pattern of individual interests and the course of development of a particular interest. On the other hand, it has to provide explanations, including theoretical statements about factors that can explain and predict inter- and infra-individual differences as well as statements about functional dependencies with regard to developmental processes.

Typical empirical results and theoretical models to describe ontogenetic aspects of interest development

At first glance, the description of ontogenetic changes is apparently easily made, and there are empirical approaches that attempt to master the scientific processing of these tasks with relatively simple means, e.g. by longitudinal survey studies. But from these findings, one cannot directly draw conclusions about psychological regularities and

principles that characterize interest development at the level of intra-individual changes. This second type of question has been investigated much less.

Exploration of general developmental trends in populations

In cross-sectional and longitudinal studies with students at different grade levels, general developmental trends in a student population have been explored. Although there are some serious methodological problems (e.g. the changing content in a certain scholastic or academic subject area which does not allow exactly the same instruments to be used over many years) the empirical results from various research approaches provide a rather consistent and differentiated picture (Gardner, 1985, 1998). For example, the results clearly seem to show that the average interest in any subject tends to decrease—especially in secondary school (Baumert & Koller, 1998; Gardner, 1985, 1998; Prenzel, 1998; Todt & Schreiber, 1998). This is in accord with results in other areas of research, which also found that as children get older, their task-value beliefs or attitudes toward school in general and toward specific subject areas tend to deteriorate (Anderman & Maehr, 1994; Eccles & Wigfield, 1992; Hidi & Harackiewicz, 2001; Lepper & Henderlong, 2000).

Several studies have tried to differentiate the developmental trajectories according to gender, school type, a subject's topic areas or context conditions. Here, considerable differences and sometimes even contrary trends can be found. In a longitudinal study about the development of physics interest in 5th- to l0th-grade students (Hoffmann, Lehrke, & Todt, 1985; Hoffmann, Hausler, & Lehrke, 1998), various areas of physics (e.g. optics, mechanics or radioactivity) were taken into consideration, as well as contexts within which each of the physics themes were taught in class (e.g. in the context of scientific argumentation: proving the validity of a scientific hypothesis, or in the context of practically important problem solutions which require basic knowledge in physics). When analysing the general (global) developmental trajectories, again a continually negative trend can be found, especially with girls. However, very different development trends can be observed when the analysis is broken down into certain topic areas and/or contexts. In lessons where physics is primarily taught as a scientific endeavour (proving the validity of a general physical laws), neither girls nor boys judge the contents of this subject as being very attractive. However, both genders show a very strong interest when the contents of the lessons and the way physics is taught can be related to their own world of experience. Girls react especially sensitively to contextual integration. This type of differential effect can also be observed in other subjects, e.g. sociology/political science (Todt & Schreiber, 1998).

In scientific discussions of the theoretical and practical conclusions from these results, it is often forgotten that data gained from survey studies do not allow^ direct statements about intra-individual developmental trends. It is not justifiable, in principle, to draw conclusions from population data about 'general laws' that can be used to describe and explain developmental processes at the intra-individual level. Even the estimation of the likelihood for the occurrence of a certain phenomenon with respect to an individual case cannot be derived directly from population data. Even though this problem is generally known, neither educational nor developmental psychology plays consequential attention to it. For example, Valsiner (1986) has demonstrated that misinterpretations are not unusual—even in the leading journals in the area of developmental psychology.

Descriptive and explanatory analyses of interest development from an intra-individual perspective

The fact that group-related results allow no reliable conclusions about the direction and principles of interest development in the individual case can be demonstrated by research approaches that explore interest development in a certain field with the same group of subjects, both at the level of group-specific developmental trajectories and at the level of intra-individual changes. In a longitudinal study on the development of job-related interests during a 2-year vocational training of insurance salespeople, we used both of these methodological approaches in order to analyse the interest development of both analysis perspectives and compare them with each other (Krapp & Lewalter, 2001; Lewalter, Krapp, Schreyer, & Wild, 1998). In this research project, we studied the interest development process in two ways: first, by means of descriptive analyses of the average level of interest in the entire sample (N = 117) using questionnaire data; second, on the basis of individual reconstructions of specific job-related interests using data from retrospective interviews at the end of the first and of the second year of vocational training in a smaller group of randomly selected subjects from the entire sample (N = 49 in the first year; N = 71 in the second year). The descriptive analyses in the entire sample ended with the same negative picture found in other longitudinal studies: interest decreases especially clearly during the first year of training. The intra-individual analyses, however, deliver a rather different picture. Here we find a marked positive developmental trend: in both the first and the second year of apprenticeship, all subjects report—without exception—that they had discovered new areas of interest during the past year of vocational education. Thus, their profile of job-related interests showed a general increase.

It might be argued that these two different results are an artefact. But what I want to show here is that results from a 'differential' research approach based on group data give no correct answer or estimate about the likelihood of developmental trends at the level of intra-individual changes. The two differing statements about the direction of interest development during the time period of this project involve rather different aspects of interest development. In the first case, it is a matter of describing (and explaining) general developmental trajectories in populations, whereby the object of interest is defined by all of the contents, activities and events in vocational training. In the second case, the focus is on indicators for the emergence of new contents or topics in the structure of a subject's pattern of (training-related) interests that provide a basis for the description of intra-individual changes. Thus, without claiming sufficient validity of the results gained with retrospective interviews, this example can demonstrate that it is very problematic to compare and evaluate empirical results about developmental trajectories without ensuring that the different research approaches really measure the same concepts and refer to the same kind of theoretical questions.

Empirical approaches that explore conditions and effects of interest development at the level of detailed intra-individual processes are rare, since it takes a great amount of effort to gain valid data during concrete interest-related activities over a longer period of time. Several research groups in Germany in the field of physics education have attempted to analyse the continuous interrelations between student's situation-specific individual experiences, cognitive processes and the occurrence and stabilization of content-specific interests. Their research approach focuses on the learning processes of students during a longer period of time. The interactions in a small group are video-documented, and the ongoing learning process is being reconstructed on the basis of observations and thinking-aloud protocols using a fine-grained interpretation system. In a further step, the results of these process analyses are related to data from

questionnaires measuring different aspects of motivation and learning outcome (e.g. Fischer & Horstendahl, 1997; Schick, 2000a; von Aufschnaiter, 1999; von Aufschnaiter, Schoster, & von Aufschnaiter, 1999). Among the studies that attempt to explore gender-related developmental processes over a longer period of the life span are those of Gisbert (1995, 2001). Using both quantitative data from an extensive longitudinal study on educational careers of German students and qualitative data (retrospective interviews with single cases), she tried to reconstruct women's individual courses of interest development from childhood to mid-adulthood and to identify those conditions and experiences that—from a subjective point of view—had an influence on the emergence and further development of the women's typical and 'atypical' interests (e.g. mathematics).

Interest development as structural change

When interest development is studied at the level of processes that refer to intra-individual changes over time, it is almost mandatory to take the structural texture of a person's spectrum of interest into consideration. Traditional methods of measuring interest on the basis of standardized interest-scales do not supply adequate information. The primary aim of these tests is to measure those aspects of behaviour that allow a reliable and valid differentiation between people and not so much to identify characteristics that allow a differentiation between the behaviour of a person in different situations or at different stages of development.

Only a few research approaches have tried to explore the course of interest development with respect to structural changes of an individual's pattern of interests over a longer period of time. Using POI as a theoretical background, Kasten and Krapp (1986) conducted a longitudinal study to explore early stages of interest development in pre-school and elementary-school children. A broad variety of data were collected continuously over a 5-year period from a small group of children (N = 12), starting with their entry in pre-school (e.g. observations, interviews with the children and their parents and kindergarten). A central aim of this study involving several case studies was to develop methodical tools and theoretical concepts for analysing structural changes from an intra-individual research perspective (see Fink. 1991, Krapp & Fink, 1992). Without going into the details of the procedure we used to reconstruct an individual's pattern of interests at a certain point of time, Fig. 1 demonstrates in a prototypical way the kind of information we gained from these structural analysis.

Figure 1 shows the result of our reconstructions for one child over four measuring points (t1-t4). The components of the central interest objects show that this child has a high preference for everything that has to do with animals, and she likes to be read to. In this case, as well as in most others, we found a rather high stability of the main components in a child's pattern of interests. The picture, however, changes when we go into detail and try to reconstruct the themes, activities and topics on a more concrete level. Here, we find a number of changes during the different stages indicated by the reconstructions at time points 1-4.

Reconstructions of the course of development found in particular cases of kindergarten children lead to the specification of *hypothetical developmental models* that offer an indication of how the occurrence and growth of an individual interest can be interpreted as specific kinds of structural changes in a person's already existing pattern of interest-related PO relationships. Fink (1991) has set out to differentiate between typical developmental models such as the growth model or the channelling

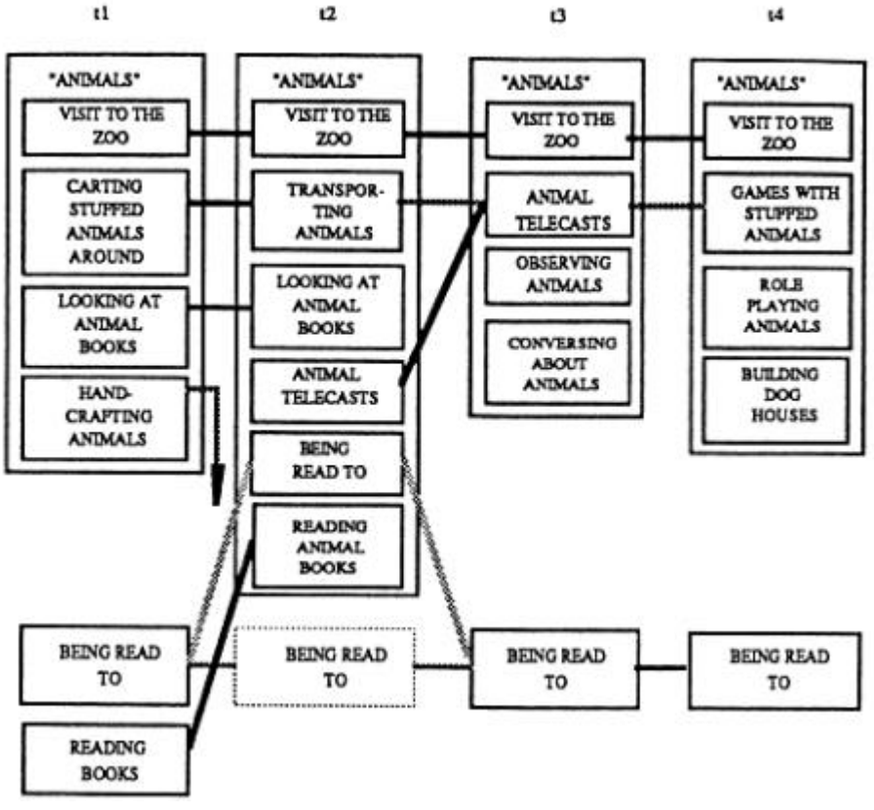

Figure I. Reconstruction of structural changes in an individual's pattern of interest over time (from Fink, 1991, p 194)

model (see also Krapp, 2002b). The 'growth modeV describes the way we tend to think about the normal pattern of interest development: the successive steps of structural reorganization of a certain PO relationship are directed towards increased differentiation. The 'channelling model' represents a course of development that is usually found in individuals with a high degree of specialization: according to this model, the structural reorganization of a growing interest occurs through increased differentiation of one particular aspect of an already existing PO relationship. This component comes to assume central importance, while other parts are excluded. Channelling of interest may also occur with respect to a person's total pattern of interest. Interest development in adolescence quite often follows this pattern. In professional life, focusing on personal interests in a few fields is often an important prerequisite for acquiring superior skills and producing exceptional achievements in a certain field of work.

Although, the description of intra-individual courses of development in view of the changes of content-related and structural components is an important aspect of an ontogenetic theory of interest, it has found too little recognition in recent research.

Stages of interest development

Independently of whether one views the development of an individual topic-specific interest or the changes in a person's whole field of interests, one can ask whether it is possible (or theoretically appropriate) to describe the course of interest development on the basis of a concept that postulates typical stages of development. In the area of interest research, there are two lines of discussion for this question. In the first case, it is a question of the developmental sequence from the first occurrence of a situational interest, which is brought to the individual from the outside, to a longer-lasting

individual interest. In the second case, it is a question of whether there is a predictable succession of stages in the development of interest which may hold true for all children and/or adolescents (eg. Todt, 1985). Here I will refer only to the first approach.

In the course of life, a person is interested in many things. Especially in childhood, many interests which are often induced from outside are 'alive' for only a short period of time. In school, for example, it is assumed that a situational interest is created by the interesting 'composition' of a teaching situation and/or the interesting presentation of a lesson and that this interest will hold over the period of teaching this specific interest-related subject or topic (Hidi, 2000). Under certain conditions, a longer-lasting PO relationship which meets the criteria for a personal interest can grow out of such a situational interest. This process, however, is usually a multi-stage process which cannot be sufficiently described by the two concepts situational and individual interest. In fact, we must consider a developmental continuum between the very beginning of a situational interest, a state which might be close to the experience of curiosity, on the one hand, and a stabilized interest of an adult who has totally identified with the related object of interest, on the other hand.

Such a multi-stage model would have to differentiate at least among three kinds or levels of interest, which—from a ontogenetic perspective—represent three prototypical stages of interest development (Krapp, 1998): (1) a situational interest awakened or triggered by external stimuli for the first time, (2) a 'stabilized situational interest' that lasts during a certain learning phase, and (3) an individual interest that represents a relatively enduring predisposition to engage a certain object-area of interest because the person has identified himself or herself with the object of interest. The first occurrence of a situational interest is primarily a matter of 'actual-genetic' processes [6]. From an ontogenetic perspective, the next two levels of interest development are of central importance. They include two qualitatively different *steps of interest development* (Krapp, 1998, 2002b): first, the shift from the transitional state of actual attraction or curiosity to a more stable motivational state which is a necessary condition for effective learning, and second, the shift from a rather stabilized situational interest to a more or less enduring individual interest (see also Renninger, 2000; Renninger & Hidi, 2002).

All three stages are important for educational action. At the first stage, it is important that the teacher succeeds in making as many students as possible curious and in creating a willingness to learn when working with new material. With respect to learning and teaching, the second level of interest development is the most important one, because—from a motivation point of view—(interest-based) learning will occur only when a sufficiently stable situational interest has been established. The third level is of central importance when we take the ultimate aims of education into account, namely to support an individual's course of personality development and identity formation. According to POI, this also depends on motivational factors, including the contents and the structure of an individual's personal interests. The development of one's own structure of interests according to one's own abilities, personal values and life-goals is a typical developmental task during adolescence and, thus, one of the most important general goals of education (H. Schiefele, 1978). And this problem remains to be solved at later stages of the life course as well.

[6] *In earlier theories of developmental and general psychology, the term 'actual genetic' was used to notify the situation-specific processes and changes of behaviour (including perception and problem-solving) which are not identical with ontogenetic processes but might be the starting point of an ontogenetic developmental process.*

Concepts and considerations for explaining educationally relevant aspects of interest development

In this section, I present some ideas about the kind of ontogenetically imported facts that an educational-psychological interest theory should inform about and how the theoretical concepts and models could be advanced by taking recent research approaches/theories from neighbouring areas of psychology into consideration. In doing so, I will discuss three questions in more detail:

(1) Where are the ontogenetic sources of the development to be found?
(2) How are new interests generated, and what kind of psychological mechanisms are responsible for stabilizing an interest?
(3) What role do individual interests play in lifelong learning and in personality development?

The origins of interest development

Completely developed interests are possible only at a certain level of development as it sees the ability to plan action as a prerequisite. However, the origins of interest are probably laid much earlier. Concurring with many development and personality theories, I believe that humans by nature tend to deal proactively with their life space themselves and that the processes necessary for acquiring knowledge and for increasing competence are experienced most directly as enjoyable and subjectively satisfactory (see also research on curiosity and exploration). Just as in Self-Determination Theory (SDT), posited by Deci and Ryan (1983, 2002), it is assumed that human beings are active by nature, and this 'intrinsic proactivity' can be found from earliest childhood onwards. Children are curious, explore their surroundings, manipulate things, try to affect the objects in their social and physical environment, and through these activities elaborate their own sense of self (Krapp, 2002a).

In early childhood, children are almost only concerned about phenomena and objects they find 'interesting' at that moment. At the same time, clear preferences for certain kinds of stimuli and/or opportunities for activity are recognizable relatively early (for a related discussion, see Donaldson, 1992). According to Renninger (1990, 2000), stable preferences for playing certain games or interacting with certain objects have crystallized by kindergarten age at the latest.

An interesting psychological question, which—as far as I know—has hardly been a topic of educational-psychological motivation research, concerns the origins of, and the conditions for, the formation of these early preference structures. Taking psycho-biological research into account, it seems reasonable to assume that individuals differ rather early with respect to 'sensibilities' for certain classes of environmental stimulation in addition to environmental stimuli. On the whole, the conclusion appears to be justified that one has to anticipate the development of relatively stable individual preferences and idiosyncrasies at a very early stage of development. These are not consciously perceived for the most part and, therefore, exercise considerable influence on the later phases of interest development. One can, for example, imagine that a child with an increased sensibility for notes and acoustic stimuli develops quite early definite preferences which the environment interprets as 'musically talented' and more or less systematically encourages in voluntarily exercised person-environment confrontations. In such a case, it is most probable that a lasting interest in music will develop.

Yet one must avoid suggesting that interest development as a quasi-linear process manifest at the outset in the development of early childhood preferences for objects—

with corresponding stimulus and encouragement from the environment—must necessarily lead to a certain type of content in the interests. Completely different topic-related interests can result from the same basal preference structure. However, this model leaves unclear how a new interest, whose contents or object cannot be interpreted by differentiating or continuing an already existing preference or interest, comes to develop.

The ontogenetic transition from situational to individual interest

The previous section discussed interest development (intra-individual) being described in the form of a heuristic stage model which can lead from an externally induced situational interest to a more or less lasting individual interest. From an ontogenetic perspective, it must be clarified how an individual interest comes to develop. What kind of psychological conditions and processes are responsible for the shift from a situational to an individual interest? Fig. 2 shows the ontogenetic transition from situational to individual interest.

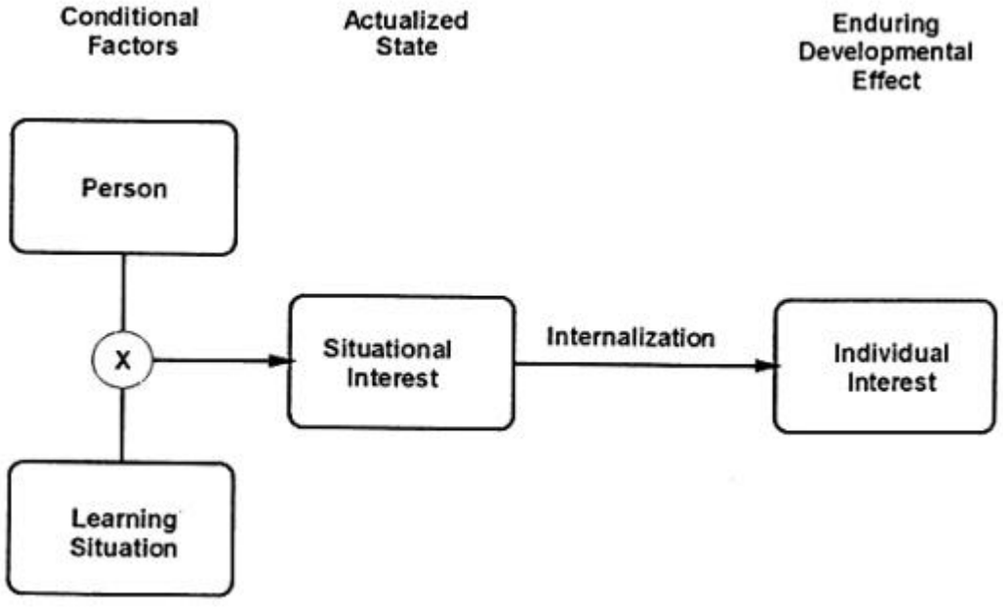

Figure 2. The ontogenetic transition from situational to individual interest (Krapp, 1998, p. 191).

In my opinion, the course of the formation of interest can be adequately explained psychologically only when one tries to understand the fundamental control process from a systemic viewpoint. It does not suffice to identify the conditional factors—that is, those factors which are intrinsic to that individual's mental system—with whose help inter-individual variance in characteristics can be statistically explained. In addition, one has to attempt to identify the functional processes in learning and development.

In POI, some theoretical considerations were developed which still need to be supplemented. On the one hand, they refer to the explanation for *'selective persistence'* (Prenzel, 1988, 1992) which is a prerequisite for continual interest action. On the other hand, it is a matter of the role of current and previous individual interests in a person's *self-system* and the influences on the development of personality that can possibly be derived from it.

An approach to explain how selective persistence comes about: The concept of a dual regulation system

The first approach concerns the problem of stabilizing an interest for a longer period, as this is an important prerequisite for maintaining a situational interest stimulated externally and the emergence of a genuine individual interest controlled from within. How can it be explained that the learner directs his or her actions selectively and steadily towards a certain object area and even holds on to it when difficulties and problems arise. Prenzel (1988, 1992) speaks of selective persistence in this connection. When an explanation is sought at the level of psychological functional principles, it seem necessary to postulate a rather complex control system which includes both conscious cognitive processes of intention formation and volitional intentional realization as well as emotional (affect-related) processes, which work partly on a preconscious or subconscious level.

With respect to the development of interests I have hypothesized that the maintenance of an existing PO relationship is directed by two functional systems which in principle act independently of each other (see Krapp, 2000, 2002a). According to this hypothesis, two kinds of determining factors have to be taken into account: first, cognitively represented factors, especially with respect to personal values, goals and volitionally derived intentions; second, feeling-related experiences during the ongoing actions which are connected to the object area of an individual's interest. POI postulates that longer-lasting interest development will occur only if both factors are experienced together in a positive way; more specifically, if a person experiences his or her actual engagements (e.g. a learning task) as personally relevant or 'meaningful' because they are related to personal goals, and if the emotion-related (affective) experiences during these engagements reach a certain qualitative level of positive feedback. The basic principle of this idea is not new. In the tradition of Dewey's conceptualization of the developing person, such a 'cognitive-affective' synthesis has been postulated repeatedly as a central condition of the emergence of a 'lasting' or 'abiding interest' (e.g. Dewey, 1913; Rathunde, 1998; Rathunde & Csikszentmihalyi, 1993).

I believe that traditional cognitive approaches to human motivation provide a variety of important and useful conceptual models that refer to the cognitive aspects within this dual regulation system. What is missing, however, are (empirically tested) concepts and models that refer to the emotional components. POI sets out to specify those emotional experiences that play a function in interest development, on the basis of the concept of *basic psychological needs*. According to Nuttin's (1984) relational theory of behavioural dynamics and the theory of self-determination (SDT; Deci, 1998, Deci & Ryan, 1985, 1991; Ryan, 1995), it is assumed that living organisms are naturally endowed with a system of primary, innate basic biological and psychological needs. During ontogenesis, these needs become more and more integrated into the increasingly complex systems of behaviour control.

Based on SDT (Deci 1998; Deci & Ryan. 1985, 1991, 2002), three qualitatively different needs can be distinguished within this system: competence, self-determination and social relatedness. Just as the fulfilment of basic biological needs is a natural necessity, sufficient fulfilment of the three psychological needs is a necessary requirement for optimal functioning of the psychological system (Deci & Ryan, 1985; Nuttin, 1984; Ryan, 1995).

The system of basic psychological needs has to be understood as a holistically working system that provides continual signals about the functional effectivity of the current person-environment interactions. With respect to interest development, the

need-related qualities of experience are important because they provide permanent, emotional feedback on the micro-level of behaviour regulation, thus contributing to the emergence of object-related preferences or aversions. It is postulated that a person will engage continuously in a certain area of tasks or topic-related objects only if he or she assesses these engagements, on the basis of rational considerations, as sufficiently important, and if he or she experiences the course of interactions on the whole as positive and emotionally satisfactory (Krapp, 1999a, 2002a; see also Deci, 1992, 1998).

The assumption that human behaviour, and thus motivation, is directed by a complex system of influence factors which are found at various levels of consciousness and act in part independently from each other has been stated in many psychological theories. Freud was probably the most prominent representative of this belief. His psychodynamic theory, however, was too speculative, and behaviourists as well as cognitive researchers rejected his multi-level theory as being unscientific and vulnerable from different perspectives. Piaget (1978), for example, has criticized the often-drawn inference that cognition is a conscious process and therefore can be deliberately controlled by the individual (Ferrari, Pinard, & Runions, 2001). That the interrelation between cognition, consciousness and control is much more complicated has been a point of discussion ever since (see Perrig & Grob, 2000). In the mean time, the trend has changed direction partly due to the influence of new research findings, e.g. in neuropsychology (see LeDoux, 1995). A growing number of psychological theories and research programmes now refer to the idea of a multi-level steering system which can be concretized in more or less obvious dichotomies such as explicit vs. implicit learning (Anderson, 1993; Reber, 1989; Sun, 2002), rational vs. experiential conceptual system (Epstein, 1990) or conscious vs. unconscious procession (Jacoby, Toth, Yonelinas, & Deubner, 1994). Until recently, these discussions have hardly been recognized in the field of educational-psychological research, although a small group of researchers have proposed similar ideas with respect to motivation (e.g. Kuhl, 2000, 2001; McClelland, Koestner & Weinberger, 1989; Spangler & Zimmermann, 1999) and self-regulated learning (e.g. Boekaerts, 1999, 2001, 2003). The growing body of empirical results presented in these research approaches appears to confirm the idea that human experience and behaviour are directed by two regulation systems and that these systems are based on different psychological function principles.

This strengthens our belief that the theoretical idea of a dual regulation system should be followed up and investigated in empirical studies with respect not only to the development of interests but also to the development of other educationally relevant motivational categories. When speaking of how need-related emotional experiences function, there are a number of empirical results that corroborate the theoretical assumptions. Studies have been carried out, for example, with students and young adults in vocational settings (Krapp & Lewalter, 2001; Prenzel, Kramer, & Drechsel, 1998) and in the domain of physics education (e.g., Schick, 2000a, 2000b; von Aufschnaiter, 1999; von Aufschnaiter et al., 1999). In our research group, we are currently studying the conditions and processes of interest development in the context of vocational education on the basis of longitudinal studies (Krapp & Lewalter, 2001; Lewalter et al., 1998; Wild, Krapp, Schreyer, & Lewalter, 1998). Here, the mechanisms of need-related qualities of experience are studied by using both quantitative and qualitative methods. The quantitative analyses are based on data from questionnaires and the Experience Sampling Method. The qualitative analyses are based on retrospective interviews with a smaller number of randomly chosen subjects from the main study. Although the results from different research approaches differ in several

aspects, they seem to support the overall hypothesis that the quality of emotional experiences has an influence on the emergence and stabilization of epistemic interests, induced in an educational setting.

There are still many unanswered questions which desperately require clarification. I am sure that basic research in different fields of modern psychology can supply valuable evidence for continuing and specifying specific explanatory hypothesis. For example, Kuhl (2000, 2001) recently developed a *'Theory of Personality Systems Interactions'* (PSI theory), where he formulated very precise hypotheses, which also appear most relevant when explaining interest development. This theory provides a rather differentiated model about the complex interrelations between action control, affect (emotional experiences during action) and long-term personality development. It includes — among other things — the assumption that the processes of activating or repressing the four basic macro-structures of personality are continuously controlled by emotional experiences (affects), and that both positive and negative affects are involved. Besides, it is not only a matter of the kind of 'emotional colouring' accompanying the action over a shorter or longer period of time; even more important are the experienced changes of positive and/or negative affects in dependence of the state of the whole psychological system at that moment.

Individual interests as components of the self-system

When one looks at interest development over a longer period of time, one realizes that some objects of interest can have a considerably higher subjective importance than others. In this respect, there are also shifts typical for a particular age group. A child or adolescent is interested in different things than an adult at the beginning of his or her career, or than an older person who has already reached the end of his or her professional life (see alsoj. Heckhausen, & Farruggia, 2003). Some of these ontogenetic changes can also be described and explained with the help of an action regulation system, e.g. the effects of changes in physical and mental skills dependent on age. They have a direct effect on experienced competence and influence (according to the dual-system regulation model), the probability of resumption, and of the kind and direction of future interest-related actions and strivings.

This explanatory approach does not suffice to understand all of the educationally important aspects of interest development during the entire life span. From everyday experience it is known, for example, that interests that were satisfactorily maintained for a long time are occasionally dropped for no apparent reason. However, interests are maintained even when their realization and continuation require relatively much effort. In developmental psychology, there are a number of concepts and results which supply plausible explanations for some of these phenomena, e.g. Havighurst's (1948) concept of developmental tasks, the concept of critical life experiences (e.g. Filipp, 1990) or the 'action-phase model of engagement and disengagement with developmental goals' Q. Heckhausen, 2000, Heckhausen & Farruggia, 2003). These especially allow good reconstruction of the general trends of interest development, taking both biological factors and the cultural and societal frame conditions into consideration.

If, however, one wants to focus primarily on the intra-individual course of interest development and its relationship to personality development, one then needs theoretical conceptions going beyond these explanatory approaches. According to POI, a dynamic model of personality development is necessary to open up the possibility of describing and explaining motivational aspects of the developing person not only with respect to individual differences, but with respect to functional relations.

Besides other aspects, such a theory has to take into account that the person is aware of himself or herself, and that the 'object' of this awareness is some sort of representation of the individual's *'self'*. From the beginning, the hypothesis represented in POI was that there are close interrelations between a person's structure of individual interests and the development of his or her self and/or identity. In order to indicate that the self has to be understood as a dynamic entity representing structural and functional properties, I prefer to use the term *self-system*. It should be noted that concepts such as 'self, 'self-system' or 'identity' only make sense within a personality theory framework that attempts to reconstruct the functional relations and dynamic 'roots' during the ongoing process of human development. From this theoretical perspective, the self is interpreted as a central constituent in the dynamic structure of the growing personality. On the one hand, the self represents the crystallized result of past development; on the other hand, it is an agent of 'intentional development' that provides both ideas about the preferred direction of development and competencies for realizing developmental intentions (Brandtstädter, 1999; see also Heckhausen & Farruggia, 2003). This idea is rather similar to Dweck's concept of a 'meaning system' which is characterized 'as a network of beliefs and goals—built arround a core theory that systematically guides behaviour' (Dweck, 2003).[7]

In accordance with theoretical approaches that interpret the course of human development from the perspective of a dynamic theory of personality (Deci & Ryan, 1985; Epstein, 1973; Fend, 1994; Kuhl, 2000, 2001; Ryan, 1993), I assume that within the complex representational structure of personality, there are areas which are recognized as components of a self-system. An individual's self (or self-system) is manifest not only in the way the person perceives himself or herself (self-concept), but also in the way the person evaluates his or her capacities, goals and attitudes (self-esteem), and in the way he or she assesses the potential for coping with actual and forthcoming life tasks. In addition to cognitive representations, emotional and motivational aspects determine the structure of the self. Under normal circumstances, the different components of the self-system represent a unified structure: a mentally healthy person lives in relative harmony with his or her attitudes, goals, accumulated capacities and knowledge structures. Nevertheless, the self-system is subject to permanent change because the social and physical environments constantly require new adaptations and force the individual to set up new goals of action and development.

With respect to human development, I assume that the self is not simply a social construct or a reflection of social appraisals and a product of developmental processes; rather, I am convinced that the individual has a great influence on his or her own development from earliest childhood onwards. At a very young age, a person already tries to affect the 'objects' in the social and physical environment depending on his or her actual needs and personal goals. The ongoing developmental changes lead to a continuous differentiation of the individual's structure of self, and it is only because there is an inborn propensity towards integration that this process of differentiation and reorganization does not lead to a compartmentalization of the self. Thus, the person tries to create and maintain a coherent image, a 'good Gestalt' of his or her sense of self.

[7] In cognitive approaches to motivation, these concepts are often regarded with suspicion. They seem not be necessary, and it is argued that they cannot really be measured at a satisfying level of reliability. The appropriateness of theoretical concepts, however, is not a matter of meeting certain measurement criteria but has primarily to do with the question about the ultimate aims of research and theory building in this domain (see Bickhard, 2003).

As a consequence, he or she cannot identify completely with all thoughts, actions, tasks and strivings, even when they are experienced as being important for the individual's wishes and future goals at the moment.

Theoretical statements about the structure and functions of the self-system formulated earlier in the POI are mainly based on general theoretical reflections and postulates that were more closely founded in other theories (e.g. in the SDT; Deci & Ryan, 1985, 1991). In more recent literature on research about human memory (e.g. on brain regions that represent antonoetic consciousness; see Wheeler, Stuss, & Tulving, 1997) and the dynamics of human development, there are a growing number of empirical studies that seem to prove the 'real' existence of an 'implicit memory of self-representations' (Kuhl, 2000), which is possibly closely connected with the self-system postulated in the POI. For example, in Kuhl's PSI Theory, one of the four postulated main macrosy'stems of personality organization refers to the idea of an 'integrated self'. According to Kuhl (2000) the self-system is only partially open to reflective, cognitive access as it is mainly made up of implicit, verbally not complete, explicable knowledge. This assumption breaks with traditional views in modern psychology. Whereas approaches to the concept of self that can be found in current personality and social psychology relate to explicit beliefs about the self, 'PSI theory postulates an implicit or "intuitive" knowledge base that integrates an extended network of representations of one's own states, including personal preferences, needs, emotional states, options for actions in particular situations, and past experiences involving the self' (Kuhl, 2000, p. 131).

The self as a central aspect in theories on personality and human development is currently gaining new importance in various areas of psychology (see Greve, 2000) and, to a certain extent, in the narrower field of educational psychological motivation research as well (e.g. Hannover, 1997, 1998; see also Fend, 2000). Many of these approaches seem to support the basic idea about the central role of the self-system for describing and explaining the dynamics of human action and personality development.

Summary and conclusion: The role of interest in human development

At the beginning of this chapter, I pointed out that in everyday education, one is still quite oriented to the concept of interest when it is a matter of describing and explaining motivational problems in school. The students' individual interests are seen as being an important prerequisite for effective and longer-lasting self-determined learning. Beyond this, relationships to individual development are to be made with reference to the interest concept. Since Herbart (1806/1965), they have served to describe pedagogically desired goals in development and education. It is assumed that the interest structure in question has an important influence on how a person develops.

The conception of an educational psychology theory of interest described here and the research approaches referring to it also attempt to give scientifically based answers to both of the practically important questions that have to be increasingly differentiated in the course of further scientific development. One main concern of all educational psychology concepts of interests is the explicit consideration of the contents of learning and development motivation. They should explain why a relatively strong or weak willingness to leam can be observed in certain people and/or in certain situations. The question should also be why someone is interested in just this topic while others hardly pay any attention to it or even reject it (Lewalter & Schreyer, 2000).

From a great variety of empirical studies in many different fields of research, we know that interest-based learning has many advantages. Students with well-developed interests in a certain subject more often use deep-level learning strategies and achieve qualitatively better learning results (Baumert & Koller, 1998; Hidi, 1990, Krapp et al., 1992; Renninger, 1998; Schiefele, 1996, 2001). Therefore, it seems reasonable to claim that teachers should, as much as possible, take care to use the already-existing interests of their students and/or to establish 'situational interest', even when this is held only for a short period of time (Hidi & Harackiewicz, 2001; Krapp, 1998).

POI assumes that interests also have a significant influence on human development. As stated above, the actual interests of a person can be seen—under certain conditions—as epistemic motivational dispositions that guide the direction and the quality of goal-oriented actions. They provide an orientation when the individual has to make decisions about the direction of future learning goals and the direction of the next step of intentional learning and development. Seen from this theoretical perspective, one could say that a person's actual pattern of interests represents the dynamic components on the way to their realization in the 'zone of proximal development' (Valsiner, 1986; Vygotsky, 1978) in the direction of a desirable 'possible self (Fend, 1994; Markus & Nurius, 1986). Whereas Vygotsky maintains that the realization of the next steps in a person's development always requires the explicit help of another person, who is more advanced, Piaget's social model also covers the possibility of a self-determined autonomous creation of one's own development (Piaget, 1981, 1995; for commentary, see Brown, 1996, 2001; Smith, 1996, 2002b).

According to POI, a person's individual interests can become a more or less stable part of the personality structure. Thus, well-developed individual interests can be interpreted as components of the self or the self-system of a person (see above). Interests differ with regard to their ranking in the hierarchy of personal values and goals. There are some that are more on the periphery, experienced with less 'ego-involvement', and others that are much more central to the self-concept of a person; they are recognized from within and from without as characteristics of a person's actual and longer-lasting identity.

Depending on the kind of position occupied by a certain interest in a person's self-system, it has a greater or lesser influence on how the personality develops. On the one hand, the influence acts through conscious cognitive control processes, e.g. through interest-based intentions that are developed in principle according to an expectancy-value model. On the other hand, one has to take into account that there is an additional influence operating at the lower levels of conscience awareness, including even subconsciously operating factors. In the end, these pre- or subconsciously mediated influences can have the same effect in principle as the conscious-cognitive decision-making procedures: besides other effects, they ensure that certain chances for learning and development receive preferential treatment, while others are neglected.

The person's currently affective interests control how behaviour is organized at various levels. As well as other aspects, interests bring about both the self-intended acquisition of new knowledge and skills in a certain area and the application of already acquired knowledge and skills in new situations. As the accumulated knowledge, together with the representations of emotional experience, forms the basis of human development, the growth of personality' is determined by individual interests to the extent that the individual has the chance and the ability to structure his or her own life and to act autonomously. In tills respect, individual courses of human development show huge differences, from both an infra-individual and an inter-individual point of view.

In addition to the currently affective interests, the earlier ones that have been given up in the meantime may also have an important potential influence on a person's development. This hypothesis can be derived from PSI theory (Kuhl, 2000) and other theories which show that actions, events and experiences of personal importance are stored in a particular way in a self-related memory system. As interest-based activities, by definition, have personal importance, it may be concluded that knowledge structures, skills, pattern of activities and other aspects of interest realization are also permanently stored in a person's representational system in this particular way. And I would assume that there are considerable differences between these kinds of long-term effects when interest-based, and thus 'intrinsically' motivated, learning is compared with extrinsically motivated learning. In the long run, this can become very important for a person's life in many ways. For example, it may be assumed that knowledge, skills and patterns for action acquired on the basis of a personal interest in earlier stages of life will be much easier to reactivate at a later point in time when the opportunity or the necessity is there; for example, reviving previous interest-based activities in older age, when many people seem to have severe problems in using their time in a meaningful way.

Taken together, one could speculate that the direction and the experienced quality of an individual's course of development are dependent to a considerable degree on the contents, quality and structure of one's personal interests that have been developed, realized and dropped at various stages during the life span.

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