

# 1 Interest, Learning, and Development

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Over the last few decades, theory and research on learning and development has shifted from discrete and largely passive models of individual functioning to models that include the individual's goals and intentions, knowledge about the self and environment, ability to develop and change optimal strategies of action, etc. Whether this represents a paradigmatic revolution, in the sense of Kuhn (1967), or is a metatheoretical consideration (Valsiner, this volume), there is no doubt that modern thinking about learning and development has been heavily based on, and to some extent restricted by, cognitive psychology.

As a result, an enormous number of new ideas, concepts, models, and theories about how the cognitive system functions, how new information is selected, stored, and organized, and how these concepts relate to both school-based and informal learning has been developed (e.g., Anderson, 1976; Kintsch & Van Dijk, 1978; Rumelhart, 1977; Van Dijk & Kintsch, 1983). There is no doubt that this research has expanded our knowledge of learning and development significantly. On the other hand, its theoretical shortcomings also have been recognized recently by more and more researchers (e.g., Bransford, 1979; Brown, 1982; Brown, Collins, & Duguid, 1989; Hidi & Baird, 1986; Hidi, Baird, & Hildyard, 1982; Jenkins, 1979; Mandl, Stein, & Trabasso, 1984; Mandler, 1975; Sorrentino & Higgins, 1986; cf. Clark & Fiske, 1982; Csikszentmihalyi, 1988; Snow & Farr, 1987; Van Dijk & Kintsch, 1983). Perhaps the most

important aspect of these critiques is that cognitive theories lack an adequate conceptualization of the impact of motivational and emotional factors in learning. This is at least true with respect to educationally important questions about how individual preferences, values, and goals are integrated into the process of cognitive functioning.

In the past, assumptions about the role of interest and its implications for meaningful learning have played an important role in both psychology and education. As early as the beginning of the 19th century, Herbart (1806/1965) developed a theory of interest based on philosophical and psychological considerations. By the beginning of the 20th century, some of the more important thinkers were grappling with the relation between interest and learning (e.g., Baldwin, 1897, 1906, 1907; Claparède, 1909; Dewey, 1913; James, 1912; Kerschensteiner, 1926; Rubinstein, 1935/1958; Thorndike, 1935; for a summary, cf. Arnold, 1906; Berlyne, 1949; Lunk, 1926, 1927).

Following this surge of interest in interest, however, there was a noticeable decline in research devoted to the topic. There are at least two reasons for this: first, the conceptualizations of interest were many and varied, and second, the development of more discrete research approaches (and theories) appeared to render a concept of interest superfluous. As a result, many investigators (frequently under the influence of Behaviorism) chose either to sharply limit the interest concept so that their measures would yield unambiguous results (e.g., vocational interest), or to avoid the interest concept entirely. Research questions that were related to interest—although sometimes the term interest was not used—typically focused on a single aspect of interest. Examples of such a single focus include research on attention (Eysenck, 1982), curiosity (Berlyne, 1960), emotion (Izard, 1977) attitude (Evans, 1971), value orientation (Allport, Vernon, & Lindzey, 1960), and motivation—especially achievement motivation (Atkinson & Raynor, 1974; Heckhausen, 1980,) intrinsic motivation (Day, 1981; Deci, 1975; Deci & Ryan, 1985), and flow (Csikszentmihalyi, 1975 Csikszentmihalyi & Csikszentmihalyi, 1988, 1990; Larson, 1988). Nevertheless, empirical research into the relation between interest and learning in some areas continued throughout this period, and, as it became more and more clear that modern theories do not adequately account for all the important aspects of the traditional concept of interest (Krapp, 1988, 1989b; Krapp & Schiefele, 1986; Prenzel, 1988), researchers have shown a renewed interest in “interest” as an explanatory construct.

Hence, various areas of research have witnessed a renaissance of the interest concept. There has been a relatively large number of new empirical studies concerned with both the influence of interest on learning and development and the origin and transformation of interests (cf. Hidi, 1990; Hidi, Baird, & Hildyard, 1982; Krapp, 1989a; Renninger, 1984, 1989, 1990; Renninger & Leckrone, 1991; Renninger & Wozniak, 1985; Schiefele, Winteler, & Krapp, 1988). This rejuvenation of interest research exhibits a variety of different interest concepts that do not lend themselves to direct comparison with one another. Rather they represent different perspectives and questions about learning and development. These concepts, however, do relate to one another in that they address complementary yet different aspects of phenomena. Up to now, the research on interest has had two foci: (a) the influence of individual interests as content- or topic-specific preferences for particular object domains, and (b) the effect of interestingness (i.e., those environmental factors found in the learning situation or material) that trigger a situation-specific interest in the learner.

### THE CONCEPT OF INTEREST

Interest can be conceptualized in a variety of ways, each of which reflects the theoretical orientation of the research questions being asked and methods being used. In spite of their differences, common to most of this work is the assumption that interest is a phenomenon that emerges from an individual's interaction with his or her environment. This idea is variously referred to as the person-object relation (Fink, 1991; Prenzel, Krapp, & Schiefele, 1986), as person-stimulus interaction (Hidi, 1990; Hidi & Baird, 1986, 1988), and as an interdependence of the individual and a class of objects, tasks, events, or ideas within a larger social milieu (Renninger, 1984, 1987, 1989, 1990; Renninger & Leckrone, 1991; Renninger & Wozniak, 1985).

Although most investigators acknowledge that interest always originates in some form of person-environment interaction, researchers assign differing significance to the two components. Specifically, there have been two distinct areas of focus. One body of research has emphasized variations in individual or personal interests, including their origins and their effects, with special emphasis being given to the effect of interest on some categories of cognitive performance, such as learning. Another group of investigators has concentrated more on the specific characteristics of any learning environment that captures the interest of

many individuals (e.g., interestingness of a text). Interest as a psychological state, and situation-specific factors that bring about interest, then, reflect two distinct research approaches for investigating the role of interest in learning and development (Hidi, 1990; Hidi & Baird, 1988; Renninger, 1990).

In addition to largely determining how the topic of interest has been researched, these two views of interest also correspond to the way in which interest as a psychological state is identified. Individual interests are always specific to individuals. Generally, researchers liken them to dispositions that develop over time. Individual interests are considered to be relatively stable and are usually associated with increased knowledge, positive emotions, and increased reference value. Situational interests, on the other hand, are generated by certain stimulus characteristics (e.g., life themes, novelty) and tend to be shared among individuals. Because this type of interest may be evoked suddenly by something in the environment, it often has only a short-term effect and marginal influence on the subject's knowledge and reference system. It may, however, have a more permanent effect and serve as the basis for the emergence of individual interests.

*Individual Interest.* In modern psychology, particularly in an applied domain such as counseling, theories and measurement of vocational interests have found wide application (Allehoff, 1985; Holland, 1985; Kay, 1982; Walsh & Osipow, 1986).<sup>1</sup> Holland's "Vocational Preference Inventory" (VPI), for example, is based on a classification scheme with six personality types, each of which is associated with a clear preference for career activities: realistic, investigative, artistic, social, enterprising, and conventional. The concept of interest as a vocationally relevant disposition is closely related to concepts of attitude in social psychology. In fact, some authors go so far as to define interest as attitude (cf. Evans, 1971; Gardner, 1975).

In addition to both dispositional theories of applied psychology and attitude theories of social psychology, interest concepts based on theories of action have become more and more common (Oppenheimer & Valsiner, 1991). This approach conceptualizes a person's interest-oriented actions to result from a multi-level process of action regulation (Fink, 1991). From this perspective, interests represent personality-specific

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<sup>1</sup> The contributions to the present volume do not address the concept of vocational interest.

orientations, reference valuations, or an awareness of possibilities for action. Interests provide important categories for action goals in these situations, where one is free to do as one pleases (reference value aspect). In addition, the effects of previous interest-oriented actions in the form of emotional reactions, differentiated structures of knowledge pertaining to the object domain (declarative knowledge), and knowledge of possible forms of engagement involving the object of interest (procedural knowledge) are all aspects of interest engagement.

For any individual, his or her interests have personal significance. The German "person-object theory of interest" (Fink, 1991; Krapp & Fink, this volume; Prenzel, Krapp, & Schiefele, 1986), for example, postulates a long-term relation between the person and a class of interest objects that are often integrated into the reference value system of a person and are basic components of his or her self-concept. Renninger (1989, 1990; Renninger & Leckrone, 1991), on the other hand, takes a more cognitively oriented approach to interest and specifies that such a relation between an individual and a class of objects (events, ideas, etc.) includes both stored knowledge and stored value but is not something of which the person is necessarily metacognitively aware. Rather, she suggests that interest as a psychological state influences the individual's subsequent activity.

There are at least two different ways in which individual interest can be conceptualized: individual interest as disposition and individual interest as actualized state. Dispositional interests are relatively enduring characteristics or general orientations to action. For example, theoretical models and empirical studies designed to explain and predict academic achievement often use measures of dispositional interest in particular content areas as predictors. This use is based on the assumption that such interests endure over the long term; interest is thought to influence learning not only in some cases, but in many or even all situations in which the learner has the opportunity for voluntary engagement.

Process-oriented theories and studies of the conditions of learning are usually less concerned with the dispositional aspect of individual interest. They devote more attention to the concrete, actualized form of individual interest. Interest can be said to "show itself" in particular psychological states, such as focused, prolonged, relatively effortless attention, all of which are accompanied by feelings of pleasure and concentration (actualized individual interest).

Such actualized interest is believed to arise out of an interaction between internal and external conditions. According to Hidi and Baird (1986, 1988), two sources are involved: the person, with his or her characteristics, attitudes, and general orientations, and the situation, which contains the special stimuli and conditions for an interested engagement. However, it should be noted that the situation-specific sources that can elicit interest include not only the characteristics of the object of interest (e.g., the content of a text), but other factors as well, such as the instructional design that fosters interest. Likewise, a person's social relationships (e.g., peers, teachers, role models) can influence the emergence of interest.

Differences among authors regarding interest as a personal characteristic stem from different conceptualizations of the individual and of the nature of task involvement. Most conceptualizations, however, include notions of knowledge and/or reference value and refer to a person's interaction with a *specific* class of tasks, objects, events, or ideas. Such specificity distinguishes individual interests from other psychological concepts such as intrinsic motivation, attention, arousal, curiosity, and exploration.

*Situational Interest.* Situational interest is used to describe interest that is generated primarily by certain conditions and/or concrete objects (e.g., texts, film) in the environment. Like individual interest, situational interest can be described from the perspective of either the cause, the conditions that induce interest, or the perspective of the person who is interested.

Research directed at the conditions that elicit interest (interestingness) has concentrated on text. The passages studied have been thought to be of general interest to people, although they might be tailored to the general interests of a particular age or other groups. Viewed from this perspective, situational interest is not unique to the individual but tends to be common across individuals. This type of situational interest, which Hidi and Baird (1988) called *text-based interest*, includes phenomena that might occur only once, or repeatedly. Examples of this type of interest are the way in which individuals react to seductive details (see chapters by Garner, Brown, Sanders, & Menke; and Wade, this volume), surprise-ending stories (Iran-Nejad, 1987, this volume), and interesting sentences in text (e.g., Anderson, 1982; Anderson, Mason, & Shirey, 1984; Shirey, this volume).

Conceptually, situational interest is similar but not identical to the concepts of curiosity and exploration (Berlyne, 1960; Görlitz & Wohlwill, 1987; Voss & Keller, 1983). Berlyne (1960, 1974), for example, argued that certain structural stimulus characteristics, such as novelty, surprisingness, complexity, and ambiguity (collative variables), lead to motivational states, marked by uncertainty and conflict, which result in curiosity and exploratory behavior. He further suggested that physiological arousal is the mediating variable between collative variables and individual performance. He maintained that these variables have arousal potential; that is, they can affect the level of arousal.

Optimal arousal is presumed to lead to optimal human performance. If arousal is too low, one seeks stimulation in order to raise the arousal level; if it reaches uncomfortably high levels, one seeks arousal reduction. In both cases, the individual manifests an increased willingness to engage in exploratory behavior. Berlyne and others have distinguished between specific and diversive curiosity, or exploration, both of which contribute to the maintenance of an optimal level of physiological arousal. It is important to note that both types of curiosity are attributed to the collative stimulus properties of an object in the person's field of experience.

Both situational interest and specific curiosity are, in some ways, motivational states that encourage a person to interact with the environment in order to acquire new information. In addition, situational interest and specific curiosity are strongly influenced by environmental factors, some of which are common to both (e.g., novelty). Although the two concepts are clearly similar, Hidi and Anderson (this volume) suggest a number of points on which the concepts differ, the most important of which are: (a) situational interest can be elicited not only by collative variables, but by content-specific text characteristics, and (b) situational interest may develop into relatively enduring individual interests.

*Relations Between the Various Concepts of Interest.* As seen in Figure 1.1, three major points of view are reflected in interest research: (1) interest as a characteristic of the person, (2) interest as a characteristic of the learning environment, and (3) interest as a psychological state. Both individual interest, in the sense of relatively stable preferences, and interestingness can bring about experiences and psychological states in an individual that are generally referred to as interest. Typical characteristics of this state might include increased attention, greater concentration, pleasant feelings of applied effort, and increased willingness to learn,

although the extent to which these characteristics are generated by interest remains an open question.

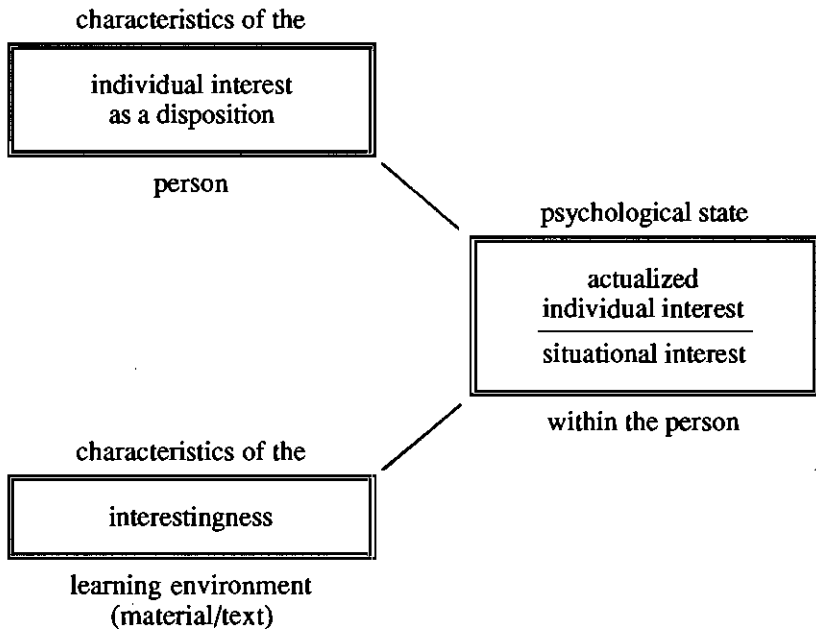


Fig. 1.1. Three approaches to interest research

Given that the theoretical interpretation and/or the operationalization of the interest concept varies from author to author largely as a function of research questions, we suggest for now that the states of interest brought about by external stimuli be separated in theory and terminology from those generated by individual interest. Although the state of interest, in the sense of an actualized individual interest, seems closely related to the experiential state of situational interest, it has not been demonstrated that the psychological processes and the effects of the two states are identical, or even comparable.

## INTEREST AND LEARNING

Educational research concerns itself first and foremost with the question of how interest affects learning. More specific versions of this question vary, depending on whether the researcher is investigating the influence of individual interests or situational interests. In any case, interest has typically been studied as an independent variable, and dependent variables have been some aspect of learning, operationalized either as a feature of an acquired cognitive structure (e.g., knowledge) or as an evaluation of achievement based on learning outcomes (e.g., grades). Some investigations have analyzed the causes or mechanisms of these interest effects. For example, they have examined the effects of more generalized learning conditions, such as learning strategies or the cognitive and affective processes involved in learning (e.g., attention).

Figure 1.2 provides a classification scheme for these studies. Empirical work is first classified by independent variable, that is, the ways in which interest has been conceptualized theoretically and measured empirically. In most of these studies interest is conceptualized in terms of individual or situational interest. The second classification shows the ways in which the dependent variables, the interest effects, have been measured. Correlational and predictive studies are typically designed to rely on measures of evaluated outcomes, such as test results and/or grades. More recent studies have been designed to measure achievement more precisely, for example, by examining subjects' cognitive representation of a text. Some studies have also been designed to analyze the effects of interest on cognitive and emotional processes in that data are gathered while the learning process is going on (e.g., nature and extent of elaborations, level of attention, intensity of flow experience).

The classification scheme depicted in Figure 1.2 identifies five fields of interest research: the relation between individual interest and academic achievement, the relation between individual interest and the structure of acquired knowledge, the relation between situational interest and academic achievement, the influence of situational interest in text-based learning, and the explanation of the interest effect. Empirical research within each of these fields seems to have evolved independently, and the exchange of ideas, methods, and results among them has been limited.

*The Relation Between Individual Interest and Academic Achievement (Field 1).* Most empirical studies of the relation between interest and academic achievement typically have been designed to use correlational

methods to explain the observed variance in achievement. Individuals' interests have been measured with formal or informal tests, or by simply asking subjects about their preferences for particular topics.

INDEPENDENT VARIABLE	DEPENDENT VARIABLE		
	learning achievement		learning process
interest	evaluated outcome (e.g. test scores, grades, GPA)	cognitive structure (e.g. knowledge representation)	mediating variables (e.g. learning strategy, attention)
interest as characteristic of the person: individual interest	field 1	field 2	field 5
interest as result of interestingness: situational interest	field 3	field 4	

Fig. 1.2. Five fields of research in the analysis of the relation between interest and learning

Some of these studies have been designed to predict academic achievement. These efforts are based on the assumption that a combination of cognitive (intelligence) and noncognitive (interest) factors can be used to accurately predict future achievement (Evans, 1971; Lavin, 1965; Super, 1960; Todt, 1978). Schiefele, Krapp, and Winteler (this volume) report findings from a meta-analysis of prediction studies, which show that across all school types, grade levels, and subjects, the best (average) correlative estimate of the interest-achievement relation is approximately .30. This relation, however, appears to be a function of gender, school subject, and age/grade level. Specifically, subject matter-related interests show a greater influence on the grades of males than on those of females. There also seems to be a stronger relation between interest and academic achievement at higher grade levels.

Information pertaining to the prognostic power of interest measurements is relevant to academic counseling, to college admission decisions, and to other matters related to students' academic futures. The problems of prediction-based decisions illustrate why researchers of these topics have conceptualized interests as a personality characteristic. Only dispositions, in the sense of stable value orientations, attitudes, or characteristics, lend themselves to long-term prediction (Friedman & Willis, 1983; Krapp, 1979; Schwarz, 1971).

*The Relation Between Individual Interest and the Structure of Acquired Knowledge (Field 2).* Most studies of the relation between individual interests and knowledge structures have focused on learning through the reading of texts. Assessment of learning has been based on both quantitative and qualitative characteristics of text comprehension, such as the number of words correctly recognized or remembered, and the type and quality of answers given to content-related questions. Most of these studies show overwhelming effects of interest that remain observable even after controlling for important factors such as previous knowledge, intelligence, and text readability. Research has also indicated that interest effects on text comprehension might be more pronounced in terms of qualitative criteria than in terms of quantitative criteria (e.g., Fransson, 1977; Hidi, 1990; Schiefele, 1988; and chapters by Hidi & Anderson; and Schiefele, in this volume).

*The Relation Between Situational Interest and Academic Achievement (Field 3).* Both naive and formal theories of instruction might suggest that classroom instruction and materials that are interesting play a large role in determining learning achievement (Hofer, 1986; Todt, 1985b; Travers, 1978). It is assumed that there is a relation between the interestingness of text, its connectedness to the material covered, and the grades and later success of the student. Whereas this assumption appears implicitly or explicitly in both research and practice, it is interesting that there seem to be no studies that have directly investigated this relation. Some researchers, however, have touched on this issue indirectly. For example, studies have demonstrated that girls are less affected by and receive poorer grades when engaging in interesting instruction in science than boys (Lehrke, 1988; Lehrke, Hoffmann, & Gardner, 1985). In an effort to explore this effect, Kubli (1987) studied the factors that contributed to the interestingness of physics, and then made suggestions for using these findings to adjust the instructional setting for girls. For example, he suggested that girls could become more interested if physics problems

were linked to social or everyday problem situations. Similar points have been made by Tobias (1978, 1990) with respect to students learning in both mathematics and science.

*The Influence of Situational Interest in Text-Based Learning (Field 4).* Research on interestingness and situational interest focuses on the role of certain text characteristics in text-based learning (Hidi, 1989, 1990; Hidi & Baird, 1988). The research methodology has usually involved the following steps. First, the stimulus text under investigation is rated for interestingness. Second, subjects perform some kind of cognitive operation (e.g., reading) with the rated stimulus. Finally, the relation between the rated interestingness and performance is determined.

The empirical research on interestingness and text-based learning has been summarized by Hidi and Baird (1986), Hidi (1990), and Schiefele (1988). Studies involving texts have shown that the following characteristics seem to foster interest: character identification, novelty, life themes, imagery value, and intensity of action (Anderson, Shirey, Wilson, & Fielding, 1987; Hidi & Baird, 1983, 1988). The overall findings also clearly show that interesting texts motivate people to read, influence comprehension, and tend to result in quantitatively and qualitatively superior learning. However, some researchers have argued that interesting text segments do not always have positive effects on learning (Garner, Gillingham, & White, 1989; Garner et al., this volume; Hidi, Baird, & Hildyard, 1982). In fact, Garner et al. (1989; see also Garner et al., and Wade, this volume) demonstrated that interesting but unimportant information, referred to as seductive details, might interfere with the learning of important ideas.

*Explanation of Interest Effect (Field 5).* Research into the effect of interest on learning and achievement consistently shows that individual and situational interest both have an important role in learning. However, what this role is and how it can be explained remain open questions. According to Krapp (1989b), explanatory variables for the interest effect can be described as reflecting different levels of analysis. Thus, on the one hand, explanations are sought at the level of general motivational and cognitive orientation, whereas the specific cognitive and affective processes that accompany the learning activity reflect another level.

One explanation for the relation between interest and academic achievement relates its effects to motivational orientations (Dweck, 1985) and/or learning strategies. Dweck and her colleagues (e.g., Dweck, 1985; Dweck & Leggett, 1988; Elliott & Dweck, 1988) distinguish motivational

orientations on the basis of the predominant type of achievement goals: "learning goals," those that aim at developing personal competence (mastery orientation); and "performance goals," those that are aimed at winning recognition from others. In reviewing recent research, Lepper (1988) concluded that a motivational orientation characterized by a willingness to engage in an activity for its own sake and an inner certainty that one is the initiator of the activity leads to comparably more differentiated and original knowledge structures among high school and college students.

Closely related to motivational orientation is the students' preferred type of learning strategy. Entwistle and colleagues (e.g., Entwistle & Ramsden, 1983), who distinguish between deep-processing strategies and surface-level strategies, argue that, in the former case, the learner attempts to see subject matter from different angles, establish diverse relationships, recognize problems, and solve difficulties on his or her own. In the latter case, the learner is satisfied to memorize facts, and prefers those aspects of subject matter that lend themselves to this. Findings from Entwistle and Ramsden (1983), Nolen (1988), and Schiefele (1989) indicate that interest-oriented learning corresponds to the deep-processing orientation. Thus, high-interest subjects are more likely to process a text by using more elaborations, establishing more cross references, and valuing the long lasting acquisition of basic knowledge than are the low-interest subjects. In this way, high-interest subjects build up a qualitatively superior representation of a text and are more able to recall basic components of it at a later point.

In contrast to the number of discussions of interest and motivation, there are relatively few discussions of the relation between interest and cognition. Much of this work has been undertaken by Renninger (this volume). Renninger and Wozniak (1985), for example, reported that interest influenced the likelihood that young children would shift attention to, recognize, and recall play objects that were identified objects of interest more frequently than other, equally available play objects. Building on these findings, Renninger's subsequent studies have addressed the role of interest in the students' access to and processing of information (see Renninger, this volume).

On a slightly different tack, a discussion of the specific characteristics of the interest-attention relation has ensued among researchers of situational interest. This discussion addresses the issue of resource allocation. A common assumption about the role of attention in learning is that the capacity of the information-processing system is limited. From

this perspective, it is expected that attention must be focused on an object for longer periods of time to allow for cognitive processing (Csikszentmihalyi, 1988; Garner, Gillingham, & White, 1989). Anderson et al. (1984; Shirey & Reynolds, 1988; Shirey, this volume) hypothesized that a reader pays more attention to the interesting portions of a text and thus focuses for a longer period of time on interesting passages. Recently, however, questions have been raised about this hypothesis. Hidi (1990) used Kahnemann's (1973) work to suggest that interest results in spontaneous rather than conscious, selective allocation of attention and, therefore, might result in learning that requires less cognitive capacity and less cognitive effort. This thesis is supported by numerous empirical findings that have been reviewed by Hidi (1990; Hidi & Anderson; and Iran-Nejad, this volume). Clearly, further work is required to clarify when interest may involve more prolonged and/or less effortful processing. In addition, research into the specific relation between interest and other affective variables such as flow (cf. Csikszentmihalyi, 1984, 1988; Csikszentmihalyi & Csikszentmihalyi, 1988, 1990) that has been linked to processing should help to further clarify the role of interest in cognition.

## INTEREST AND DEVELOPMENT

Only a few studies have addressed the relation between interest and development. Consistent with the organization of our discussion of interest and learning, we first focus on individual interest and then on situational interest as a developmental condition and outcome.

*Individual Interest as a Developmental Condition and Outcome.* Two lines of empirical studies that have focused on individual interest can be identified: those that address the influence of an existing interest on the subsequent activity of an individual, and those that investigate the changing role of interest in learning at different developmental stages.

As Renninger (this volume) indicates, studies that have focused on the influence of interest on subsequent activity suggest that young children are overwhelmingly influenced by their individual interests across a diverse set of problem-solving contexts. In older children and adults, on the other hand, the effect of interest appears to be task specific. For example, interest seems, at least in certain conditions, to influence reading more than writing (Hidi & Anderson, this volume) or mathematics (Renninger, this volume). Furthermore, Renninger reports that within-subject analyses

of student performance in both reading and mathematics indicate that the text difficulty/level of problem further influences the impact of interest on learning (Renninger, 1991, this volume).

From a Piagetian (1968, 1981), Wernerian (1978), and/or Vygotskian (1967) perspective, it might be presumed that the preoperational child first uses individual interest as a forum for exploring properties of objects. Such focused practice appears to facilitate the child's actions with objects, viewed as interests and noninterests. Older students, in contrast, are usually required to engage in a range of tasks to which they respond differentially. As such, they presumably need to attend to classes of objects and events that are not necessarily of interest to them (see Renninger, this volume).

Study of the relation between the development of interest and the varying task requirements of different domains (e.g., reading, math) is in its infancy, as is an understanding of the differing effects of students' individual interests, the role of task difficulty in interest, the implications of gender differences in what is identified as inherent, and the links among interest, motivation, achievement, and temperament. Based on findings to date, it appears that interest serves differing roles in development as a function of age (Todt, 1978). Moreover, findings that suggest different effects of interest on performance across domains, or subject areas, also suggest that the nature of the task and the specific role of interest as a facilitator or scaffold for access, attention, or recall may have both universal and idiosyncratic aspects that need to be teased out. In an effort to study the changing role of interest over time, Krapp and Fink's (this volume; Fink, 1991) longitudinal studies of preschool and kindergarten children indicate that at this age children's interests are relatively stable, increasingly complex, and progressively more differentiated over time. Other studies have focused on an observed decline in school content-area related interests that begins around age 11. This trend is most pronounced in mathematics and science but holds across school subject areas and school culture. It is also observed to be more pronounced for girls than for boys (Lehrke, 1988; Lehrke, Hoffmann & Gardner 1985; Todt 1985).

Of major concern in recent research on interest development have been the questions of how students gain and change interests in content areas such as math and science, and how related gender differences can be explained. Developmental changes in interest can be observed during early puberty, when peers have the most important influence (Todt, 1985). Todt also argues that theories and results related to the development of vocational interests (Barak, 1981; Gottfredson, 1981) may help to explain

developmental changes in subject matter interests. Other related issues involve the integration of gender roles into self-concept, and awareness of social-status differences, both of which are apparent at much earlier ages. Clarifying the role of interest in students' learning and development, and its subsequent implications for theory, research, and practice, provides a detailed agenda for future research.

*Situational Interest as a Developmental Condition or Outcome.* Whereas the possibility of short-term effects may make situational interest seem to be less relevant to developmental considerations than individual interest, several important questions have emerged from research on situational interest that can be related to development.

Hidi (1990) suggested that situational interest and individual interest are not dichotomous phenomena that occur in isolation. On the contrary, these types of interest can be expected to interact and influence each other's development. More specifically, she argued that situational interest, triggered by environmental factors, may evoke or contribute to the development of long-lasting individual interests. Future research will be needed to examine the extent to which situational interest serves as a developmental condition for individual interests. Because specific curiosity and exploration are related to certain aspects of situational interest, further research into the relation of interest and these topics may provide further clarification of the role of situational interest in the origins of interest development (Krapp, in press).

There has been very little research on how situational interest changes with age. In one of the few related studies (Hidi & McLaren, 1990), it was reported that children in grades 4 and 6 had interest ratings of topics and themes only moderately correlated with adult's ratings. A subsequent qualitative analysis of the topical rating differences showed that children tended to be generally less interested in social science topics than adults, and that children were most interested when they had moderate knowledge of the topics. Whether these findings would hold up across different age groups in a variety of domains has yet to be determined.

## CONCLUSIONS

Research on interest has typically been undertaken based on practical considerations involved in students' learning, such as interest as a facilitator for skill development, learning from text, or student motivation. As the chapters collected in this volume demonstrate,

however, the research to date has focused primarily on interest as an independent variable. As such, the variables studied, the questions posed, and the methodologies employed have been driven by a need to establish how interest affects achievement, cognition, vocational choices, and so on, rather than questions related to the nature, determinants, and functions of interest per se. Although this has served to link research on interest to other paradigms and to practice, there has been little effort, prior to this volume, to address the larger issues of how research programs on interest might complement one another, or what a coherent set of questions on interest might address.

The present volume was compiled to facilitate discussion of how different approaches to interest might be better understood, and how subsequent investigation of interest might be designed to further our understanding of the role of interest in learning and development. Questions that are informed by these chapters but remain, as yet, unanswered include: (a) How can different conceptualizations of interest be related so that they fit together as aspects of a larger construct? Even if all the conceptualizations cannot be unified into a coherent theory of interest, consideration of the range of foci in interest research should make possible an exchange of different viewpoints within the context of a more general field of interest research. (b) What kind of research strategies and methods fit the demands of educationally/ ecologically relevant interest research? Some problems of past research may have been the result of not considering this question. (c) How might existing theories and research results be utilized in everyday practice? This goes well beyond the metatheoretical problems of theory construction. It involves the research problems that are selected, the concepts that are used, and the ways in which interest is operationalized via instructional procedures and measurements.

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