Development of Motivation

16

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16.1 Development of Control Striving Across the Lifespan: A Fundamental Phenomenon of Motivational Development

This chapter explores the relationship between motivation and development from two perspectives: the development of motivation, on the one hand, and motivational influences on development, on the other. Whether it is a question of the development of motivation or the motivation of development, the regulation of human behavior shifts in accordance with lifespan developmental change in the individual's potential to control the environment. The lifespan theory of control (Heckhausen, 1999; Heckhausen & Schulz, 1995; Schulz & Heckhausen, 1996) is a motivational theory of lifespan development (Heckhausen, Wrosch, & Schulz, 2010). The theory identifies constructs and articulates hypotheses specifying how individuals respond to the waxing and waning of their potential for effective control at different stages of life and in different areas of functioning and thus provides a useful conceptual framework for the investigation of development and motivation.

The starting point and conceptual core of the lifespan theory of control is the functional primacy of primary control (Heckhausen, 1999; Heckhausen & Schulz, 1999). The striving to exert control on the environment (primary control striving) is hypothesized to be a universal and fundamental characteristic of human motivation that evolved over a long phylogeny of behavioral regulation. A preference for self-produced effects on the environment over effects produced by others has been found in various mammals (see overview in Heckhausen, 2000a; White, 1959) and may even determine the behavior of all those nonmammalian species with a locomotor system that enables them to influence their environment.

As illustrated in Fig. 16.1, primary control striving is expected to remain high and stable throughout the lifespan, despite substantial changes in the potential for effective action. It is primary control capacity that undergoes radical change. From a state of almost complete helplessness and dependence on others in infancy, primary control capacity surges in childhood and adolescence, levels out at some point in young or middle adulthood depending on the biographical path taken, and declines again in old age. This decline is reflected in multiple functional impairments toward the end of life, and finally, death.

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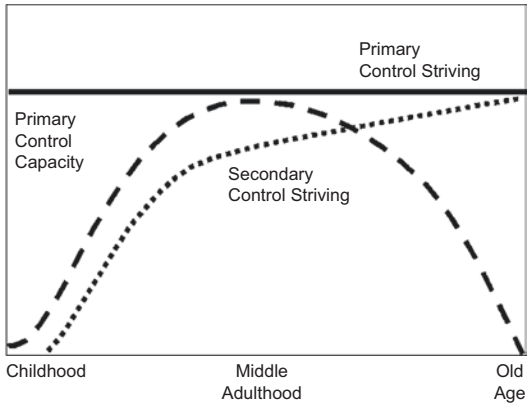

Fig. 16.1 Hypothetical lifespan trajectories of the capacity for primary control, primary control striving, and secondary control striving (Based on Heckhausen, 1999)

The rapid growth in control capacity in early life and its decline toward the end of life present young and old with very different challenges and risks, requiring the investment of quite different resources. Although humans seem to start their lives with a built-in readiness for control striving, neonates are so helpless that almost all experiences of control consist in influencing the behavior of their parents (especially the mother). Apart from compensating for children's lack of manual and intellectual proficiency, adult caregivers provide an external scaffold for the motivational (goal-setting) and volitional (persistence and shielding against distraction) regulation of behavior. Early parent-child interactions thus represent the cradle of primary control striving and of action itself (Sect. 16.5). Given the rapid development of primary control potential from birth to mid-childhood, children frequently find themselves able to master difficulties that seemed insurmountable only a short while ago (Parsons & Ruble, 1977). As a result, they are likely to overestimate their capabilities and may be at risk for setting overly demanding goals. Sozialization agents (i.e., parents and teachers) seek to address this risk by setting tasks appropriate for a child's level of cognitive development and by encouraging children to abandon overly ambitious goals that are doomed to failure.

Age-related decline leads to a complementary pattern of effects in old age. The aging individual has to come to terms with an increasing restriction of social roles (e.g., children moving out, retirement, widowhood) as well as biologically determined functional decline (e.g., in cardiovascular health, physical strength, sensory functioning, and memory). These experiences of permanent loss of control can lead to frustration, experiences of helplessness, and risk of depression and despair, and the danger of older people relinquishing the potential for control prematurely and becoming dependent on others too soon. In contrast to young children, who lack experience in emotional and motivational self-regulation, older adults can apply secondary control strategies (Fig. 16.1), which serve to protect self-esteem and confidence in future success against the negative effects of control loss. These secondary control strategies can help to focus the remaining control capacity on more promising goals.

The motivational and volitional regulation of behavior must respond to these radical shifts in primary control capacity across the lifespan. Take the example of learning how to walk; it is a major accomplishment for 1-year-olds but soon becomes taken for granted as a basic functional competence – usually until old age, when it once again becomes a challenge – and a competence to be protected against age-related decline. How do humans adapt the goals and challenges they set for themselves to such radical changes in primary control capacity? How do they maintain a functional level of stability in the emotional and motivational prerequisites for effective action? These are the research questions addressed within the framework of the motivational theory of lifespan development (also referred to as "lifespan theory of control").

16.2 Early Control Striving

Humans, and at least some animals, seem to be born with a built-in readiness for control striving and for exerting direct or primary control on the physical and social environment (White, 1959). Studies on operant learning have shown that many mammals prefer behavior-event contingencies to event-event contingencies, even in the absence of consummatory behavior (for an overview, see White, 1959). Chimpanzees favor objects that can be moved, changed, or made to

emit sounds and light (Welker, 1956); rhesus monkeys spend hours solving mechanical puzzles (e.g., bolting mechanisms; Harlow, 1953); and both children and rats prefer response elicited rewards to receiving the same rewards regardless of their behavior (Singh, 1970).

- These findings indicate that behavior-event contingency striving is a basic nonconsummatory need in mammals. From the very beginning of life, humans and other mammals are evidently equipped with information-processing strategies and behavioral orientations that help them to detect, strive for, and produce behavior-event contingencies, thus increasing their control of the environment (i.e., primary control). Humans have a natural propensity to focus on self-produced action outcomes. This propensity forms the basis for further developments in the experience of control, such as the ability to compare the effects of an action with an intention or a standard of excellence or to draw inferences about one's own competence on the basis of an action outcome and its evaluation. These two developmental milestones are reached in the first 3 years of life.

The preadapted, innate behavioral orientations that facilitate individual primary control and that – to draw on Fodor (1983) – can be termed motivational behavioral modules (Heckhausen, 1999, 2000a, 2000b) also include exploration striving, which some authors conceptualize as a "curiosity motive." It may be misleading to classify exploration and curiosity, or indeed anxiety, as motives (Trudewind, 2000), because these behavioral tendencies do not in fact relate to specific content categories. Rather, they are general approach or avoidance orientations that regulate behavior in diverse situations and across the major categories of motivated behavior, achievement, power, affiliation (Trudewind, 2000; Trudewind & Schneider, 1994). Curiosity and exploration increase individuals' opportunities to test and develop their control of the environment. The striving for new and discrepant experiences ensures that control striving is not limited to constant repetition of what has already been achieved.

Example

The psychopathological phenomena of echopraxia (i.e., the pathological repetition and imitation of movements) sometimes observed in cases of autism, mental disability, and extreme social deprivation is a negative example for the adaptivity of curiosity. In these cases, contingency striving seems to be in overdrive, running on the spot and thus ironically inhibiting the development of primary control potential.

Another fundamental regulatory mechanism that promotes primary control striving is the asymmetry of affective responses to positive and negative events. As pointed out by Nico Frijda (1988), the fact that individuals quickly get used to the positive affect experienced after a change for the better, but experience stronger, longer-lasting negative emotions after a change for the worse, promotes continuous control behavior that does not "rest on its laurels" but strives to overcome setbacks and constraints to control and to change the environment for the better.

16.2.1 Development of Control Striving

The first manifestations of control striving in human ontogeny can be observed in newborn babies (Janos & Papoušek, 1977; Papoušek, 1967). In fact, the ability to engage in operant behavior may develop in the womb. Papoušek found that babies just a few days old learned head movements contingent on acoustic signals and milk reinforcement. Even when they were no longer hungry and the milk had lost its reinforcing potential, the babies continued to respond to the acoustic signal with a turn of the head and showed positive affect when the milk bottle was presented as expected.

Taking a behaviorist perspective, Watson examined how operant learning can be fostered by providing opportunities for experiences of behavior-event contingency in the first months of life (Watson, 1966, 1972). Watson trained his

3-month-old son to fix his gaze on Watson's closed fist, at which point Watson opened his hand. After just a few days of training, the 3-month-old showed anticipatory arousal, followed by intense pleasure when the expected effect occurred. More recent cross-cultural studies with infants from Africa and Europe have shown that infants' learning of contingencies between their own behavior and external events (e.g., movement of a mobile) universally occurs at the age of 3 months, although its frequency depends on specific experiences in interactions (Graf et al., 2012). Further studies showed that change in the contingencies between behavior and effect (e.g., changing from the right to the left fist, visual fixation on the left fist, opening the right hand) did not lead to extinction of the learned response but was mastered increasingly quickly. Moreover, success was associated with increased positive affect. Watson hypothesized that infants can already develop generalized contingency awareness if exposed to appropriate operant experiences. This assumption was confirmed in a series of studies showing transfer from one contingency experience to another, interference of noncontingent experiences (Finkelstein & Ramey, 1977; Ramey & Finkelstein, 1978; Rovee & Fagan, 1976; Watson & Ramey, 1972), positive affect in response to behavior-contingent outcomes (Barrett, Morgan, & Maslin-Cole, 1993), and negative affect to noncontingent stimulation that had previously been contingent (DeCasper & Carstens, 1981).

Definition
Piaget (1952) labeled this kind of control striving "secondary circular reactions": infants repeat activities that have previously produced certain effects time and again and respond to the effects with positive affect.

This kind of early control striving has been labeled mastery motivation and investigated by two major research groups: the students and associates of Leon Yarrow and of Susan Harter. Harter (1974, 1978) and colleagues have focused on mastery motivation in the early school years, whereas Yarrow and colleagues (e.g., Yarrow et al., 1983) have examined striving for control and mastery in the first 3 years of life. Their definition of mastery motivation is largely congruent with that of achievement motivation:

> Mastery motivation is viewed as a multifaceted, intrinsic, psychological force that stimulates an individual to attempt to master a skill or task that is at least somewhat challenging for him or her (Barrett & Morgan, 1995, p. 58).

These authors have developed a detailed methodology for the measurement of instrumental (i.e., persistence and curiosity) and expressive (i.e., outcome-related affect) mastery behavior and, in a host of studies, have predicted later achievement striving and even cognitive performance itself on the basis of interindividual differences in early mastery behavior (see the overview in MacTurk & Morgan, 1995).

Barrett and Morgan (1995) identify three phases in the development of the multifaceted phenomenon of mastery motivation during infancy and toddlerhood:

Phase 1: early control striving with a primary explorative orientation toward new experiences and challenges to the infant's own control capacity; Phase 2: systematic variation of activities to create an intended effect; and Phase 3: the intended behavioral goal becomes the indicator of behavioral success.

Recent approaches to the development of executive control provide innovative conceptualizations of the emergence of control striving as well as behavioral and self-regulation (Garon, Bryson, & Smith, 2008; Miyake et al., 2000; Zelazo, 2004, 2015; Zelazo & Carlson, 2012). Executive control includes goal-oriented activities that are conscious, deliberate, and based on top-down neurocognitive modulation (Zelazo & Carlson, 2005). In particular, these modulations of behavioral regulation refer to processes that focus cognitive attention and play a crucial role in flexibility (e.g., when changing the goals of a task), inhibition control (e.g., delay of gratification), and working

memory (Miyake et al., 2000; Zelazo et al., 2013). Preschoolers make significant developmental progress in these goal-oriented modulation processes. This progress follows a developmental sequence of different levels of consciousness and reflection (Zelazo, 2004, 2015) that is reminiscent of Piaget's conception of child development but based on fundamental cognitive processes and their neurophysiological foundation: Neonates are on level (1) known as *minimal consciousness* and do not possess conscious representations of control striving and its effects. Their behavior relates to the present and lacks reflection or any connection to a concept of self. At the end of the first year, infants enter level (2) known as *recursive consciousness*. This mode of representation allows them to remember actions beyond their immediate occurrence. Thus, the effects of infants' own behavior can turn into intended goals. These goals are no longer restricted by rigid behavior-effect contingences but can instead be pursued with goal-oriented behavior that can be adapted to changing circumstances. At the end of the second year, children reach level (3) defined by *self-awareness*. Their thoughts, feelings, and behavior become self-reflective. Thus, they are now able to recognize themselves in a mirror or feel pride or shame following success or failure (see Sect. 16.4). When they reach age 3, children enter level (4) known as *reflective consciousness*. They gain the ability to simultaneously think about different rules and their effectiveness. An advanced stage of reflective consciousness later enables 4-year-olds to consider even incompatible rules and perspectives at the same time and thereby initiate radical changes in their behavioral strategies. At this stage, children are also able to assess the perspectives and knowledge of others based on current circumstances (*theory of mind*).

The early development of consciousness continues throughout adolescence and adulthood, albeit at a slower pace. Early advances in executive control thus constitute the universal foundation of a lifelong development of executive functions. Additionally, the development of executive control might also lay the groundwork for individual differences in self-regulation, which have important consequences for long-term development. Longitudinal studies have, for example, shown associations between the development of executive functions and later performances in school and aptitude tests (Bindman, Pomerantz, & Roisman, 2015; Neuenschwander, Röthlisberger, Cimeli, & Roebers, 2012). Other longitudinal findings on the prediction of life success in middle-aged adults based on indicators of self-control (that essentially correspond to executive control) measured before age 10 even suggest extremely long-term influences although the underlying processes, such as higher competence or better adaptability in the social contexts of school and work, are not yet understood (see Moffit et al., 2011).

16.2.2 Early Experiences of Control Striving in Parent-Child Interactions

The first experiences of control do not occur, as Watson had suspected, in experimental manipulations of behavior-event contingencies or in the infant's manipulation of objects but in natural interactions between the infant and the adult caregiver. Long before infants are able to produce direct effects on their environment, they influence their parents' behavior in everyday interactions (see the example below). Papoušek and Papoušek (1987) demonstrated that mother's responses to certain behaviors of their infants show high reliability and low latency and occur without conscious control.

Example

The mother's greeting response to eye contact with her child is a case in point: the mother's mouth is opened, the eyes opened wide, and the eyebrows raised whenever the infant gazes at her face. This reaction is automatized and cannot be suppressed. It provides the infant with repeated, reliable contingency experiences that make minimal demands of the infants' competence to initiate action.

Maternal contingency behavior (also known as responsive behavior) seems to be conducive to the formation of generalized contingency expectations as well as to habituation to redundant stimuli (e.g., Lewis & Goldberg, 1969; Papoušek & Papoušek, 1975, 1987). Furthermore, maternal stimulation and its contingency to the child's behavior seems to be positively related to the development of intelligence (Clarke-Stewart, 1973; Clarke-Stewart, Vanderstoep, & Killian, 1979). Riksen-Walraven (1978) provided compelling evidence for these relationships in a longitudinal study with an experimentally varied intervention design. Mothers were trained either to provide more stimulation for their child, or to be more responsive (i.e., contingent on the child's behavior), or to provide both enhanced stimulation and responsiveness, and to maintain this behavior over a 3-month period. Findings showed that enhanced stimulation levels had favorable effects on habituation rate (shorter habituation times) only and did not have an impact on exploratory behavior or contingency learning. When mothers showed heightened responsiveness in their interactions with their children, thus creating a contingent environment, however, there were very favorable effects on both exploratory behavior and the rate of contingency learning.

Investigation of exploratory behavior, another important component of control striving in early social relationships, necessarily raises the issue of mother-child attachment and the metaphor of the mother as a secure base (Ainsworth & Bell, 1970; Ainsworth, Bell, & Stayton, 1974; Sroufe & Waters, 1977). In Harlow's early work (Harlow & Harlow, 1966; Harlow & Zimmermann, 1959) on bonding behavior in rhesus monkeys, the natural mother was replaced by a "surrogate mother" made of either wire mesh or terrycloth, with milk being provided by baby bottles mounted within the models. It emerged that surrogate (terrycloth) mothers provided emotional support, stimulating young rhesus monkeys to engage in more extensive exploratory behavior and even confrontation with unknown objects. Drawing on these and similar findings, leading researchers in the field concluded that infant-mother attachment is based not only on a need for closeness but on a balanced system of curiosity and caution that permits exploration but evades dangers (Ainsworth, 1972; Sroufe, 1977). This dyadic behavioral system facilitates the gradual extension of mobility and autonomy throughout the infant's motor and communicative development. By the end of the first year, children are able to withdraw from situations independently and to visually (Carr, Dabbs, & Carr, 1975; Passman & Erck, 1978) and auditorily (Adams & Passman, 1979; Ainsworth & Bell, 1970; Rheingold & Eckerman, 1969) seek reassurance from the caregivers' presence.

- A relatively low tendency for maternal interference in the child's exploratory activities (i.e., provision of "floor freedom") has favorable effects on the mother-child bond and was found to be the second strongest predictor of children's intelligence (Ainsworth & Bell, 1970; Stayton, Hogan, & Ainsworth, 1971) after responsiveness (i.e., contingent responses to the child's behavior).

16.2.3 Development of Agency in the Parent-Child Dyad

Infants' early experiences of control are thus bound up with their primary social bonds to caregivers, with their striving for autonomy within these relationships, and the restrictions placed on them. At this early age, experiences of control in the domains of achievement, power, and affiliation are not yet separable. Differentiations in control experiences, control striving, and control behavior soon begin to emerge, however, particularly as infants begin to manipulate objects and as social (affiliation and power/autonomy) and nonsocial motivations (achievement) become distinguishable and, in some cases, collide. Colwyn Trevarthen's observations on the development of intersubjectivity are particularly relevant in this context (Trevarthen, 1980; Trevarthen & Aitken, 2001; Trevarthen & Hubley, 1978). According to Trevarthen children's behavior is driven from birth by two complementary, but sometimes conflicting, motives:

- The motive to have an active influence on objects
- The motive to interact with other humans

Over the first 2 years of life, these two motives for object-related control and social relationships alternate and come into mutual conflict. In their first 3–4 months, infants are focused on other humans, particularly the primary caregiver. Behavioral regulation of aspects such as visual attention and excitability is much smoother and less abrupt in interactions with the mother than in interactions with objects. Furthermore, there is some evidence of mechanisms that foreshadow gestures and language (pregesturing and prespeech; Trevarthen, 1977), indicating that human infants are preadapted to interact with other humans (see also Meltzoff & Moore, 1977).

At about 6 months of age, in what Trevarthen labels the "praxic mode," children begin to play with objects on their own and to pay the primary caregiver less attention than before (Trevarthen, 1980; Trevarthen & Hubley, 1978). If the mother is involved in the child's manipulation of objects at all, she tends not to specify the goal of the activity but rather to be guided by the child's interest in certain objects (see, e.g., Collis & Schaffer, 1975). Conflict often ensues if a caregiver does try to determine the action goal – not because the child rejects the adult per se or prefers the object per se, as Trevarthen suggested, but because the two behavioral intentions are in competition. The child seeks to defend his or her intention against the caregiver's interference and attempts to dominate. In this way, the infant's achievement- and power-related strivings become merged.

In the second year, parent-child interactions with objects become more cooperative at a new level of intersubjectivity, which Trevarthen calls "secondary intersubjectivity" (Trevarthen & Hubley, 1978). The child adopts challenging action goals proposed by the mother, and both work together to achieve them. Cooperation and persistence in pursuing the shared action goal initially relies on the mother keeping the infant's attention focused on the task at hand, thus providing an external scaffold for volitional action control (see the following study and Heckhausen, 1987a, 1987b; Kaye, 1977; Rogoff & Wertsch, 1984; Wood, Bruner & Ross, 1976). As the child becomes increasingly competent, however, the action goal becomes the focus of the joint interaction. Initially, neither party is concerned about who contributes most to goal attainment. During the second year, the mother increasingly emphasizes the child's competence and expects the child to work toward the goal independently. Once children have acquired a categorical self-concept, they internalize these expectations. From the age of about 2 years, the shared goal of a task that is challenging but not overly difficult is no longer the action outcome itself (e.g., building a tower) but the development and demonstration of the child's competence (Heckhausen, 1988). The shift from a focus on producing outcomes to demonstrating the child's competence is triggered by the mother's refusal to provide help, but later vehemently defended by the child, independent of direct maternal influences (see also the study on "wanting to do it oneself" on page 390; Geppert & Küster, 1983).

Study

Behavioral Regulation in the Mother-Child Dyad: From Apprentice to Master

In a longitudinal study (Heckhausen, 1987a, 1987b, 1988) with children ages 14–22 months and their mothers, J. Heckhausen investigated change in the joint regulation of behavior in mother-infant dyads. Early in the child's second year, maternal instruction was explicit and specific (e.g., which shape fits which hole) and involved a highly redundant combination of verbal and nonverbal communication. As the children internalized the task intention (e.g., to build a tower, to put all the shapes in the correct holes), the mothers stopped giving explicit instructions, and their guidance became increasingly implicit. In one task, children had to fit geometric wooden shapes into the corre-

(continued)

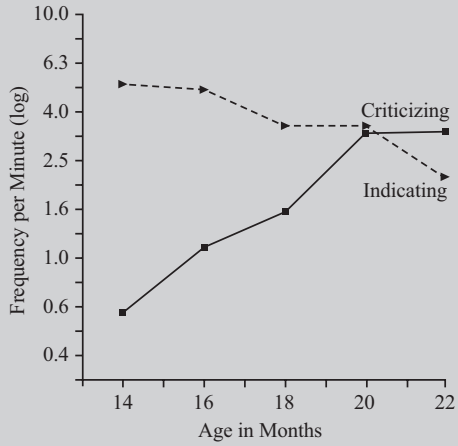

Fig. 16.2 Mothers' instruction on the shape-sorting task: indicating the correct solution vs. criticizing the child's slot choice (Based on Heckhausen, 1987a)

sponding slots in a wooden board. Figure 16.2 shows the change in maternal instruction observed over time from age 14 to 22 months. Early in the study, when the children were just 14–16 months and still found the task very difficult, mothers indicated the correct slot at a high frequency per minute. Provision of this kind of direct, nonverbal help decreased as the children grew older. Instead, the mothers increasingly began saying "No, not that one" or otherwise criticizing the child's incorrect choice of slot by verbal means, without showing them the right solution.

At the same time, the mothers fostered the development of positive self-evaluation at age 12–18 months by praising the children's successes effusively. As the children's ability to regulate their behavior increased – as reflected in repeated attempts to solve a task (persistence) – the frequency of maternal task-centered motivating attempts decreased; by the end of the second year, mothers barely voiced any praise and frequently refused requests for help. Concurrently, the children became increasingly likely to register their own successes and to show joy (gazing and smiling at their "work") or even pride (smiling and making eye contact with their mother) at successful outcomes. This higher frequency of pride responses was associated with increased requests for help after experiences of failure from the 18th to 20th month, indicating the children's growing awareness of their own shortcomings, and recognition of the adults' superiority. By the age of 22 months, help-related communication was observed in most mother-child dyads, whether the child asked for help and the mother refused or the mother offered help and the child rejected it. The shared goal had evidently shifted from a joint focus on completing a task and producing an outcome (e.g., building a tower of blocks) to promoting and demonstrating the child's competence: "I did it myself."

Summary

Control striving is a fundamental motivational process not only in humans but also in various animal species. The behavioral modules that support control striving include exploration and curiosity as well as the asymmetry of affective reactions to positive and negative events. Newborn infants already show first signs of striving for behavior-effect contingencies. They make their first experiences with control in interactions with their parents. Early parent-child interaction is the cradle of action in multiple ways. It is here that the major, universal foundations for individual action regulation are laid: experience of control, goal setting and persistence, autonomy and resistance to the imposition of external goals, mastery of difficulties, enjoyment of intended action outcomes, ability attributions of successful action outcomes, and, finally, defense of ability attributions against the "threat" of outside help. At the same time, the significance of early parent-child interactions necessarily exposes children to certain risks. If parental influences are not appropriate to a child's level of development or are otherwise unfavorable, the development of

motivation and behavioral regulation may be misdirected, resulting over time in maladaptive motivational patterns.

16.3 Focusing on the Intended Outcome of an Action

Between 9 and 12 months, infants gradually begin to determine which means accomplish particular ends and enter a new developmental phase of mastery motivation that lasts until the second half of the second year (Barrett & Morgan, 1995; Yarrow et al., 1983; Zelazo, 2004). Children of this age experiment with different activities or with modifications of actions that have previously produced certain effects. Indeed, children approaching the end of their first year often get completely carried away by an activity, losing sight of their original goal. For example, Jennings (1991) reports that children of this age enjoy collecting objects in a container. When they have collected all of the available objects, they simply empty the container and start all over again. It is not the outcome of the action – having collected all of the objects – that is the focus of their attention but the activity of collecting. Children in this phase of development display an impressive level of persistence in their control striving. This stage of development coincides with what Trevarthen (1980; Trevarthen & Hubley, 1978) labeled the "praxic mode" at age 6–12 months, when children begin turning away from an overwhelming preference for social interaction to increasing interest in manipulating objects (Sect. 16.5).

During the second year, the focus of children's attention gradually shifts to the outcomes of their actions, although they do not yet begin to draw inferences about their competence (Sect. 16.2). The regulatory demands of focusing on an intended action outcome differ depending on the goal in question:

- Sudden, discrete effects:
- Effects such as banging a drum or dropping an object command attention virtually automatically, making them attractive action goals that give children's activities directionality early in the second year (Spangler, Bräutigam, & Stadler, 1984; see also Yarrow et al., 1983, on "effect production").
- Continuous, action-accompanying effects:
- Regulation of a volitional focus on effects such as the nodding of a pull-along duck is significantly more demanding.
- State-related goals in multistep activities:
- Focusing on these goals is particularly demanding. They occur on completion of an action and are only identifiable by the fact that they correspond to the original action intention, e.g., a finished tower of bricks or a tin containing all the available marbles.
- "Respecting one's work":

Hildegard Hetzer (1931) labeled this last type of action goal and the related affect "respecting one's work" (see also Bühler, 1922, on pleasure in satisfaction ["Endlust," "Befriedigungslust"] as opposed to pleasure in functioning and creativity ["Funktionslust," "Schaffenslust"]). From the age of about 18 months, children learn to keep sight of the ultimate goal in a multistep activity (e.g., collecting marbles in a jar) and to terminate the activity no sooner and no later than they have attained that goal (see also experimental studies by Bullock & Lütkenhaus, 1988; Lütkenhaus & Bullock, 1991). Such state-related action outcomes persist even after an action is completed and may prompt children who have developed a self-concept to evaluate the effectiveness of their actions and even their competence (Sect. 16.4).

- State-related goals in multistep activities make higher demands of *volitional action control*, which serves to ensure that attention and behavior remain focused on the chosen action goal, even if its outcome can only be attained after the successful completion of a number of subtasks.

Summary

Between 18 and 24 months, the development of control (or mastery) motivation enters a new phase. The intended outcome of an action now

becomes the yardstick against which its success is measured. It is thus at this point that standards of excellence set by the child or by others take effect as criteria of successful or unsuccessful action. From the age of around 17–18 months, children show increasing interest in attaining specific standards when manipulating objects, especially in situations where they feel observed (Kagan, 1981). For example, they can be quite determined to repeat a sequence of actions accurately, to construct a tower with all the available blocks, or to complete a jigsaw puzzle. These standards are often introduced by parents or older children (Sect. 16.5) but are later adopted by the toddlers themselves.

16.4 Establishment of Personal Competence as an Action Incentive

Anticipatory self-reinforcement is an important motivational resource for achievement-motivated behavior in adults (Heckhausen, 1989). An action goal is not attractive because of the intrinsic value of mastering a standard of excellence alone but also because attaining an action goal allows positive inferences to be drawn about one's competence. It is disputable that these inferences are intrinsic achievement-motivated incentives in the strict sense, because self-evaluation is not activity- or outcome-immanent (Chap. 13). Within the framework of Heinz Heckhausen's (1989) extended model of motivation, self-evaluation can be seen as one of many potential consequences of an action outcome. Which of these consequences are most important to a given person and in a given situation does not depend on the centrality of the self-concept of ability in a given cultural and social context (see, e.g., Heine et al., 1999). In addition to the incentives of the action outcome (reaching a personal standard of excellence) and its internal (self-reinforcement) and external (recognition of others, educational and career advantages) consequences, incentives residing within the activity itself ("activity-related incentives"; Rheinberg, 1989; see also Chap. 13) may also play a major role in achievement-motivated behavior.

16.4.1 Pride and Shame: Emotions Between Achievement and Power

Of the many and diverse incentives for achievement-motivated behavior, three that play a prominent and ubiquitous role are the exploration of personal competence, the emotional and social-cognitive reinforcement of positive conceptions of personal competence, and the demonstration of personal competence to others. Recent research by Tracy and Robins (2008) shows that pride reactions are reliably recognized far beyond Middle European and North American cultures, namely, among socially isolated tribes in Burkina Faso, West Africa.

- The predominant conceptual model of achievement-oriented behavior – the risk-taking model and its extensions (Atkinson, 1957; Heckhausen, 1989) – specifies self-reinforcement to be the decisive motivational force and the emotions of pride and shame to be the major positive and negative incentives for achievement-oriented behavior. Accordingly, research on the development of motivation has paid a great deal of attention to the development of emotional responses to success and failure in early life (Heckhausen, 1988).

Heckhausen and Roelofsen (1962) examined how 2- to 5-year-olds responded to success and failure in a tower-building competition. It was clear from the reactions of the younger children (2- to 3.5-year-olds) that their experience was focused on the effects of their action; as a rule, however, they did not yet show the typical expressions of success and failure associated with self-evaluation. A few children began to show these responses at 27 months, but most did not do so until 42 months. When these older children won, they raised their eyes from their work, smiled, and

Fig. 16.3 Responses to success. (**a**) Annegret (6;3) spontaneously exclaims, "I [won]!". Triumphant, proud "enlargement of the ego" relative to the experimenter (13th trial). (**b**) Maria (4;3) spontaneously: "I [won]!". Sits up straight and "enlarges the self" (4th trial). (**c**) Ursula (5;2) spontaneously: "I finished first again!" Expression of pride: beams at the opponent, upright upper body (2nd trial) (From Heckhausen, 1974, p. 157, Fig. 27, p. 155, Fig. 23, p. 163, Fig. 36)

Fig. 16.4 Responses to failure. (**a**) Claudia (4;6), posture expresses deep shame about failure: tries to disappear from view (sixth trial). (**b**) Franz-Josef (6;0) says, "You [won]", takes hold of his cap, and turns his head away in shame (fifth trial). (**c**) Ursula (5;2) spontaneously: "Hmm, you finished first." Embarrassed smile of failure, bent posture, fails to disengage from her work (ninth trial) (From Heckhausen, 1974, p. 167, Fig. 28; p. 164, Fig. 40; p. 163, Fig. 37)

gazed triumphantly at the loser (Fig. 16.3). They straightened the upper body, and some of them even threw their arms in the air as if to enlarge their ego (see also studies on the social recognition of pride reactions, Tracy, Robins, & Lagattuta, 2005). When they lost, they slouched down in their chair, lowered the head, and avoided eye contact with the winner. Instead, their hands and eyes remain "glued" to their work (Fig. 16.4). These postural expressions of pride and shame reflect a close relationship to dominant and submissive behavior (Geppert & Heckhausen, 1990), which seems to have been elicited by the demands of the competitive situation. Taking a pluralist view on the activity-related and outcome-specific incentives that may motivate achievement-related behavior, these postural responses of pride and shame seem to express emotions between achievement and power, rather than prototypical achievement-related emotions. The achievement vs. power components may be elicited to differing degrees in different situations, producing hybrid forms dominated by either power or achievement. A systematic investigation of conditions triggering different degrees of achievement- and power-related emotions would be a productive field for further research. Another approach that focuses on individual personality differences distinguishes between two distinct facets of pride and its behavioral expression: *Authentic pride* that is clearly related to performance and *hubris pride* that is primarily meant to be a form of self-aggrandizing image presentation (Tracy & Robins, 2007a). Both

forms of pride are known in collectivist and individualist cultures (Shi et al., 2015).

Later studies that did not require some of the cognitive abilities that had been presupposed in the competition study (e.g., the ability to make comparative time judgments; Halisch & Halisch, 1980; Lütkenhaus, 1984) found first pride responses at 30 months and first shame responses somewhat later, at 36 months (Geppert & Gartmann, 1983). Stipek, Recchia, and McClintic (1992) reported similar findings from their competition study: children younger than 33 months smiled and showed pleasure at having completed a tower, regardless of whether they finished first or last, showing that they were simply pleased at having achieved their objective of finishing the tower. Schneider and Unzner (1992) found that children's emotional responses to self-produced effect (without competition) and to success in a competitive situation did not differ until age 4. In another study, Stipek, Recchia, and McClintic (1992) observed that even the youngest children in their sample (12 or 13 months) showed positive affect in response to their own successes but not to the successes of the experimenter. It was not until the age of 22–39 months, however, that winning children sought eye contact with the experimenter, meaning that the self-evaluative emotion of pride could not be inferred before the age of around 2 years. Lütkenhaus (1984) had 36-month-olds do a shape-sorting task with their mothers and noted both positive ("I can do that") and negative ("I can't do that yet") verbal self-evaluative responses at this age.

J. Heckhausen observed even earlier pride responses in a study with mother-child dyads (Heckhausen, 1988). By the age of 20 months, almost half of the children responded to success in building a tower or fitting shapes into the appropriate slots by simultaneously making eye contact with the adult and smiling and in some cases even presenting the product of their work. These responses were associated with intensive and frequent maternal praise at previous points of measurement. The children who showed pride responses at age 20 months had been praised about once every 2 min at age 16 and 18 months. Interestingly, the frequency of praise decreased as the children began to show spontaneous self-reinforcing responses to success (Sect. 16.5).

The development of the capacity to engage in self-evaluative reflection on the outcomes of one's actions goes hand in hand with an important progression in the child's self-concept from the "self as a subject" to the "self as an object" (Geppert & Küster, 1983; see also the study reported below on "wanting to do it oneself"; Heckhausen, 1988; Tracy & Robins, 2007b). This is also in line with more recent conceptions about the development of executive control and conscious reflection, which assume that infants transition to a self-reflective way of thinking about their own control at the end of age 2 (Zelazo, 2004). At about 18 months of age, children begin to explore the self and to evaluate themselves on descriptive dimensions or in terms of categories. Lewis and Brooks-Gunn (1979) term this the "categorical self." The capacity for self-reflection leads to first experiences of pride in successful action outcomes. The child is now able to interpret information about an action outcome as information about the self – "I'm clever because I can build a tower."

The study by Geppert and Küster (1983) reported in the box below provides insights into the developmental prerequisites for both focusing on a self-produced action outcome and relating that action outcome to one's own competence.

Study

Study on "Wanting to Do It Oneself"

Geppert and Küster (1983) observed children ages 9–78 months performing various tasks (e.g., playing with matryoshka dolls, completing picture puzzles, throwing balls at cans). The experimenters made offers of help ("Shall I help you?", "I'll help you!") and announcements of intervention ("Please may I do it?", "I'll do it now"), the directness of which was varied systematically. The objective was to examine the relationship

between the development of the self-concept and the first occurrence of "wanting to do it oneself" (i.e., rejecting an adult's help and interference). Behavioral tests were administered to assess the development of the self-concept. For example, children were asked to pick up the blanket they were sitting on and give it to the experimenter. Children who have not yet developed a basic self-concept are not able to see themselves in elementary, physical terms and do not understand that they must step off the blanket in order to pick it up. These children accepted help without protest, evidently because they were indifferent to who actually executed the action. It was only at the age of about 1.5 years that children who had developed a concept of self began to protest against any kind of intervention. They did not want their goal-directed activity to be interrupted. If the experimenter intervened immediately before the final step in the task (placing the last building block on the tower), their protest took the form of fits of rage, demonstrating just how outcome oriented children are at this developmental stage.

The older children (age 2.5 years and older), who were able to recognize themselves in a mirror, showed another characteristic pattern of behavior. They were more likely to accept interventions and interruptions but vehemently refused offers of help. Their protests often involved verbal articulations of the wish to do it themselves, with utterances of "me!" or their first name. These children with categorical self-concepts obviously had little difficulty in maintaining a continuous stream of activity despite being interrupted by the experimenter. However, offers of help threatened the attribution of success to their own competence and thus weakened the major incentive for engaging in achievement-motivated behavior.

The authors investigated the developmental prerequisites for wanting to do it oneself – an interesting phenomenon in the development of achievement motivation and a defining characteristic of what laypeople call the "terrible twos" (see Kemmler, 1957; Goodenough, 1931, on anger in young children).

Because of the prevailing focus on self-evaluative action-outcome consequences, achievement motivation research has largely lost sight of one key issue that warrants mention here. Every achievement-related action is characterized by a multitude of incentives residing in the activity itself, the action outcome (reaching an intended goal) and the internal (self-evaluation) and external (other-evaluation and social or material consequences) action-outcome consequences (Chap. 13). Analogous to the development of cognition (e.g., Siegler, 2002), the development of motivation may be characterized by intraindividual variability in behavior and experience across the developmental trajectory. The sequence of development of motivational and volitional regulatory capacities is relatively fixed, but early forms of control striving – e.g., the "flow" experience of becoming completely absorbed in an activity (Chap. 13; Csikszentmihalyi, 1975) or the focus on a sudden, discrete action effect (Spangler, Bräutigam, & Stadler, 1984) – remain available and can be used by older children and even adults in concert with more complex patterns of motivation and volition (Jennings, 1991). The system of mastery motivation can thus be seen as a hierarchical structure (Harter, 1978) comprising various subcomponents (enjoyment of the activity, joy on achieving a goal, pride in the competence demonstrated by a performance outcome), which allow affective, cognitive, and social aspects to be combined in new and more complex regulatory systems. Individuals can thus respond flexibly to a multitude of situations and differing incentive patterns (e.g., high activity incentive/low self-evaluation incentive, or vice versa). In fact, the regulatory capacity to achieve congruence between one's motivational orientations and motive state across the various situations in which one wishes to exert control

(see the concept of motivational competence, Rheinberg, 2006) may itself be an important developmental attribute that is first adopted from adult socialization agents but increasingly mastered by the child himself or herself.

Summary

The nature of action-related emotions changes and develops in early childhood, with the focus shifting from behavior-event contingencies in early infancy, to achieving a specific outcome (standard of excellence) from about 1.5 years of age, and finally to self-evaluation against a certain standard of excellence from the age of about 2 (playing with the mother) to 3 (competition) years. Self-related emotions of pride first occur at about the same age, as children acquire the ability to conceive of the self as an object (Bullock & Lütkenhaus, 1991; Geppert & Küster, 1983; see also "categorical self-concept" in Lewis & Brooks-Gunn, 1979). Children who have acquired a self-concept begin to reject adults' offers of help, possibly to ensure that success can be attributed solely to their own competence, Geppert & Küster 1983).

16.4.2 Risks of Self-evaluative Responses

A positive evaluation of one's competence is also considered to be an important motivational resource in theoretical contexts other than achievement motivation – in the present case, for primary control striving. The motivational theory of lifespan development (also referred to as "lifespan theory of control") (Heckhausen, 1999; Heckhausen & Schulz, 1995) highlights the effects of general control, that is, the individual's primary control of the environment, on self-esteem. Although a focus on self-evaluation can have a wealth of positive consequences, it also makes individuals (and their perceptions of their own competence) vulnerable to the negative effects of failure. To the extent that goal-directed actions serve as tests of personal competence, the individual is exposed to the risk of negative self-attributions (e.g., low competence, low self-esteem), particularly in social comparison situations with high levels of ego involvement (Brunstein & Hoyer, 2002; see also Chap. 9). These negative self-attributions can undermine the motivational resources needed for continued control striving and must be counteracted and compensated by strategies of self-serving interpretation and reevaluation, conceptualized within the theoretical framework of the lifespan theory of control as compensatory secondary control strategies (Heckhausen,1999; Heckhausen & Schulz, 1995).

- Self-esteem may be protected by compensatory strategies of secondary control such as the following:
  - Attributing failure to external factors, thus negating personal responsibility for failure
  - Engaging in "downward" social comparisons with people who are even less successful
  - Engaging in intraindividual comparisons with domains in which one is personally more competent

The following paragraphs discuss the development of negative self-evaluations and early forms of compensatory secondary control. Research in this area is still in its early stages, particularly where coping with failure is concerned.

Interestingly, expressions of the self-evaluative emotions of pride and shame parallel power-related gestures of dominance and submission, at least in western industrialized societies. Along with the upside of pride-based empowerment, self-evaluation thus involves the downside of shame-based humiliation and helplessness, which Dweck (2002) has found to characterize children with a strong orientation to performance goals. Stiensmeyer-Pelster and colleagues have examined processes of increasing helplessness in children exposed to repeated failures in the school setting (see the overview in Stiensmeyer-Pelster, Chap. 15). Their findings indicate that repeated everyday experiences of failure can be a major risk factor in the development of maladaptive long-term motivational and evaluative tendencies (Sect. 16.7) in the approach vs. avoidance

components of achievement motivation, mastery vs. performance goal orientation (Dweck, 2002; Dweck & Leggett, 1988), and state vs. action orientation (Kuhl, 2000, Scheffer, 2000; see also Chaps. 3 and 13).

Negative self-related emotions such as shame and embarrassment are not observed until rather later than pride, however, primarily because children younger than 2.5 years respond to failure by changing the task parameters, turning their back on the task, or expressing anger and then abandoning the task (Stipek et al., 1992). In a study of mother-child interactions in task situations, about 30% of children showed anger responses after failure on noncompetitive tasks from the age of 20 months (Heckhausen, 1988). The first signs of children beginning to attribute failure to a lack of personal competence at the age of about 2 years are indirect and implicit in help-seeking behavior after failure, which was observed in some 25% of 22-month-olds (Heckhausen, 1988). Geppert and Gartmann (1983) had children ages 18–42 months build a tower in four different conditions: success without competition, success with competition (finishing first), failure without competition (tower collapses), and failure with competition (not finishing first). Pride responses to success were observable from the age of 30 months, but shame responses to failure were not seen until 36 months, regardless of whether or not a competitive element was involved. Real shame at failure is evidently not experienced until much later than pride, from 3 years of age. This developmental sequence shields children against the potentially harmful effects of negative self-evaluation in early childhood.

Moreover, preschool children's conceptions of their own competence do not yet distinguish between the causal concepts of effort and ability. As a result, children of this age tend not to doubt their ability, even in the face of repeated failures (Rholes et al., 1980). Interestingly, they base their judgments more on socioemotional criteria (Is another child nasty or nice?) than on performance criteria (Sect. 16.6.2, Sect. 16.6.3). By the age of school entry, children have developed a self-concept of ability that is differentiated from effort and tend to experience performance decrements after failure (Miller, 1985).

16.4.3 Strategies to Counteract or Avoid Negative Self-evaluation

As soon as children become aware, at the age of about 3.5 years, that action outcomes reflect on their own competence, they begin to shield their self-esteem against the adverse consequences of negative self-evaluations by engaging in behaviors such as the following:

- Denying the failure
- Reducing the level of aspiration
- Making self-serving attributions
- Reinterpreting the action goal (standard of excellence)

In an early study on task choice in preschool and school-age children, Heckhausen and Roelofsen (1962) found that even 3.5-year-olds lowered their aspiration level after experiencing failure, switching to much easier tasks instead. In the tower-building competition study mentioned above, children between 2 years and 6 years showed a variety of failure-related expressions and behaviors which can be classified according to control theory as follows: disengagement from the goal (e.g., interruption, leaving the room), self-protection (e.g., denying failure, making excuses for failure, remembering past success), and enhancement of primary control (e.g., preparations, getting a head start). Simple denial of failure was observed in almost all of the children up to the age of 3.5 years but became increasingly infrequent with age, only being used by less than a third of children older than 5 years.

The cognitively demanding self-protective strategies of excusing failure (e.g., "My arm is tired now") and recalling earlier successes (e.g., "But I finished first before") were only used by children older than 4.5 years.

Empirical Findings on the Development of Self-regulatory Strategies

More recent research on the development of compensatory secondary control has focused less on experiences of failure and more on coping with negative and stressful events or situations (e.g., getting a shot at the doctor's). During childhood and early adolescence, numerous coping strategies are acquired, including a variety of secondary control strategies (see overview in Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Skinner & Zimmer-Gembeck, 2007). One example is an experimental study by Vierhaus and colleagues, in which children between 7 and 14 years were presented with a challenging situation for the assessment of different coping strategies. The authors found that children begin to increasingly consider the controllability of a given situation when judging the effectiveness of strategies, resulting in a more flexible preference for either active strategies and asking for help or avoiding and internally moderating strategies (Vierhaus, Lohaus, & Ball, 2007). Skinner and Zimmer-Gembeck (2007) list the following central coping behaviors in an overview of 44 related empirical studies: problem-solving, seeking help, flight, distraction, adjustment, opposition and denial, self-reliance, aggression, social isolation, bargaining, helplessness, and positive cognitive reappraisal. These 12 categories of coping behavior can further be grouped into four classes of strategies: problem-solving, seeking help, flight/avoidance, and distraction. Interestingly, these four categories correspond to four (of five) important control strategies in the motivational theory of the lifespan (Heckhausen et al., 2010): selective primary control, compensatory primary control, goal disengagement, and self-protection. As they grow older, children become increasingly adept in flexibly using appropriate strategies depending on a given situation, instead of automatically resorting to their preferred strategies regardless of the circumstances. Over time, many strategies are further refined and integrated into cognitive representations (e.g., when planning problem-solving or anticipating one's own emotional reactions) while their behavioral components become more parsimonious and effective.

Evidence from several studies shows that children of early school age prefer primary control strategies and report very few intrapsychic (secondary) control strategies, even when exposed to uncontrollable stress. One of the most popular control strategies at this age is to escape the unpleasant situation altogether (Altshuler & Ruble, 1989; Band & Weisz, 1988). As children age, they increasingly use the emotional regulatory strategy of self-distraction techniques (e.g., "I think about something fun"; Wertlieb, Weigel, & Feldstein, 1987) to cope with unpleasant situations (e.g., going to the doctor's). Altshuler and Ruble (1989) confronted 5- to 12-year-olds with hypothetical scenarios of uncontrollable stress that required high levels of self-regulation. The respondents were asked to imagine that a child has to wait patiently for either a positive event (a large piece of a candy after half an hour's wait, a birthday party later in the day) or a negative event (going to the dentist, getting a shot). They were then asked to suggest what the child in the story might do. The 5- to 6-year-olds were far more likely than the 7- to 11-year-olds to recommend escape or avoidance behavior. Nevertheless, children as young as 5 years of age generated behavioral distraction techniques (e.g., do something else, watch TV), thus demonstrating an elementary understanding of self-regulatory strategies. With increasing age, the children became more likely to propose cognitive distraction (e.g., thinking of something else or fantasizing).

Secondary control strategies seem to proliferate between childhood and particularly adolescence (Compas & Worsham, 1991). Wrosch and Miller (2009) investigated the sequential interplay between depressive episodes and the developing competence of goal disengagement during adolescence in a longitudinal study with depression-prone girls between 15 and 19 years of age. The authors found that the depressive symptoms measured at the beginning of a 19-month period predicted improved goal disengagement, which in turn resulted in fewer depressive symptoms at the end of the study. These findings suggest that the

development of strategies for coping with failure and other negative events, particularly with regard to the roots of interindividual and intercultural differences, is an extremely prolific field of research. For example, whether someone prefers the self-serving effect of downward social comparison or tends to attribute unpleasant events to external causes may depend largely on the cultural context and on the model provided by the parents. These preferences can have far-reaching implications for behavior and, in turn, for the long-term behavioral consequences of failure. For example, external causal attributions may protect self-esteem in the short run, but eventually lead to helplessness; downward social comparisons may allow people to stay active but fail to provide inspiring role models for control striving.

Summary

When infants discover their own competence, they gain an important behavioral incentive which by means of anticipatory self-reinforcement provides self-generated motivation, independent from external influences. Self-assessment and self-concept develop hand in hand. The flip side of the positive motivation derived from pride of success is shame in reaction to failure. Just as pride and dominance are related, shame is associated with submission, which may result in helplessness and demotivation. These effects, however, can be avoided when suitable self-protective strategies are used. Such strategies and the competence to disengage from impossible goals emerge early during development and become more elaborate and effective throughout childhood and particularly during adolescence in protecting the self and motivational resources from discouragement and even depressive symptoms.

16.5 Developmental Preconditions of Achievement-Motivated Behavior

This section provides an overview of research on the major milestones in the development of achievement-motivated behavior and, in particular, the cognitive prerequisites for the risk-taking model. The research agenda and review of available findings on the risk-taking model presented in the first version of this chapter (see Chap. 13 of Heckhausen, 1980) remains unsurpassed in its differentiated approach, conclusiveness, and theoretical integration. In the last 30 years, research on the developmental prerequisites of achievement-motivated behavior has been rather heterogeneous – there has been a great deal of interest in some aspects (e.g., the conception of ability, reference norms), but others have been neglected altogether. Research on universal motivational development has become less salient, while more attention has been directed at the development of individual differences in achievement goal orientation and behavioral regulation (see Dweck, 2003; Elliot, 1999; Nicholls & Miller, 1983; for an overview, see Elliot, 2005). The subsequent Sect. 16.6 will discuss individual differences in the development of motivation.

16.5.1 Distinguishing Between Degrees of Task Difficulty and Personal Competence

The perception of differences in task difficulty is a prerequisite for the formation of standards of excellence. Task difficulty and competence define each other: the more difficult the task executed, the higher the competence demonstrated. Given that task difficulty cannot be determined independent of the individual's competence,[1] success can just as well be attributed to ease of the task as to high competence, and failure can just as well be attributed to high task difficulty as to low competence. The question to be asked, therefore, is what children do first: do they first explain success and failure in terms of task difficulty or in terms of competence?

- It is not until children are able to process and integrate information relating to individual

[1]The term "competence" is used as a summary construct comprising both ability and effort.

reference norms (How well did I do on other versions of the task at previous attempts?), on the one hand, and social reference norms (How well do other children do on the task?), on the other, that empirical studies indicate a clear preference for difficulty attributions (in intra-individual comparison) or competence attributions (in interindividual comparison).

Research has shown that 3- to 5-year-olds are not yet able to alternate flexibly between individual and social reference norms (Heckhausen & Wagner, 1965) and that 6-year-olds can only do so to a certain extent (DiVitto & McArthur, 1978).

Findings from numerous studies point to a developmental primacy of difficulty attributions – and thus individual reference norms – at preschool age (Falbo, 1975; Heckhausen & Wagner, 1965; Ruble, Parsons, & Ross, 1976). Barrett, Morgan, and Maslin-Cole (1993) observed that even very young children take task difficulty into account, with 15-month-olds already showing more persistence on moderately difficult tasks than on tasks that were too easy or too difficult for them. Preschoolers do not yet draw on social comparison information to assess their personal competence. Ruble and Feldman (1976, Study 1) told the children participating in their study that "almost all" or "very few" children of the same age were able to solve the tasks assigned. The emotional reactions that the 8- and 10-year-olds showed in response to their performance outcomes differed significantly as a function of this information; those of the 6-year-olds did not.

School entry affords children increased opportunities to compare their task-specific performance with that of their peers, with the result that social norms become increasingly dominant (Ruhland & Feld, 1977). In the first 2 years of elementary schooling, children realize that they would have to be particularly clever to solve tasks that few other children are able to answer. This insight is associated with a decreasing self-concept of reading ability (Miller, 1987), but it is not until the age of 9 or 10 years that children are able to rank themselves realistically relative to their classmates (Nicholls, 1978). Rheinberg, Lührmann, and Wagner (1977) examined the reference-norm orientations of secondary students in grades 5–13. As shown in Fig. 16.5, the

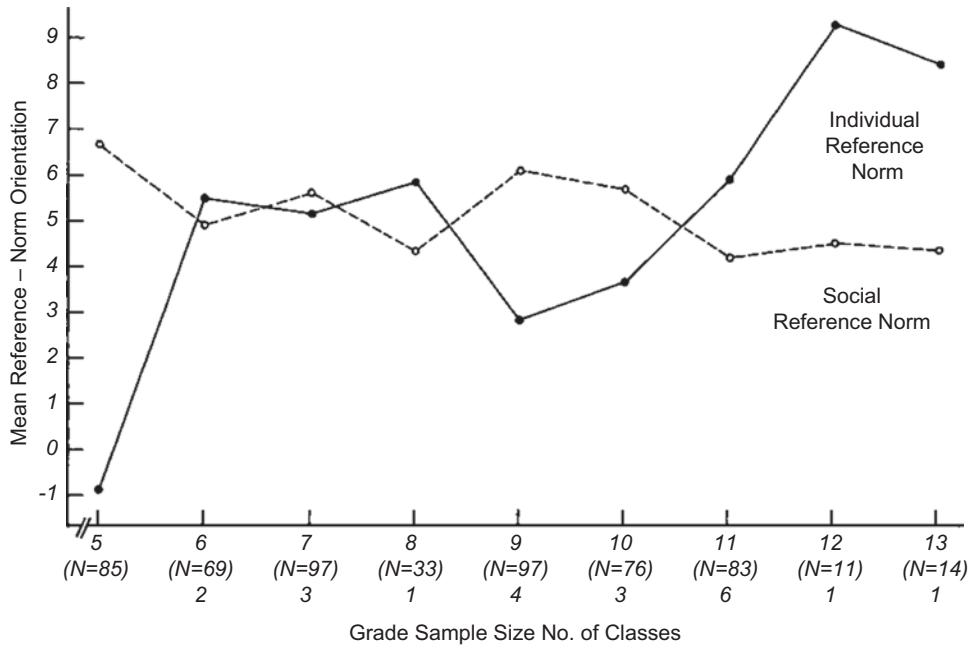

Fig. 16.5 Mean preferences for individual and social reference norms in the self-evaluations of secondary students in grades 5–13 (After Rheinberg et al., 1977, p. 91)

importance of individual reference norms soars at the lower end of this age range. They are as important as social reference norms by grade 6 and become increasingly dominant from grade 11 (i.e., about age 17) onward. Aspects of the social ecology of the school and society as a whole were found to have specific effects within this standard developmental trajectory. For example, students in comprehensive schools, where the range of student ability is broader than in tracked schools, were found to prefer social reference norms for longer. Students approaching graduation began to pay more attention to social reference norms, which were likely to be of greater relevance to future employees.

Recent studies on the so-called "big fish little pond" effect have shown how strongly students' individual reference norms and their self-assessment are shaped in highly selective schools and high-performing classes (Marsh & Hau, 2003, Marsh et al., 2015). If the immediate school environment is dominated by other high-performing students, a students' self-assessment of his/her abilities tends to be low, even if she/he is proud to belong to a highly regarded school at the same time ("reflected glory effect;" Marsh, Kong, & Hau, 2000; Trautwein, Lüdtke, Marsh, & Nagy, 2009).

Another effect of reference norms can be found in comparisons across different fields for the same person, for example, if a student thinks that he/she performs better in mathematics than in language classes. These so-called dimensional comparisons (Marsh et al., 2014; Möller & Marsh, 2013) may have important behavioral consequences as they play a role in the development of subject-related interests and incentives (Schurtz, Pfost, Nagengast, & Artelt, 2014). They also help students to steer clear of subjects in which they expect to perform poorly. Thus, dimensional comparisons between academic subjects and between other achievement areas can influence course selection as well as the investment of time and effort at school and university.

Summary

Children first learn to distinguish different degrees of task difficulty at preschool age and do not start applying social reference norms to evaluate their competence until starting school. At the transition to secondary level schooling, individual reference norms gain in importance, first drawing level with social reference norms and becoming very dominant in the last 2 years of schooling. With the transition to the adult world, social comparison again takes precedence. When social reference norms are dominant, high-performing reference groups tend to result in low self-assessments, whereas low-performing reference groups can boost the self-ascribed competence ("big fish little pond" effect).

16.5.2 Distinguishing Causal Conceptions of Ability and Effort

It is only gradually that differentiated conceptions of ability and effort emerge from a global conception of competence. The conception of effort as a variable causal factor that is under volitional control seems to develop relatively early. It takes longer for children to recognize ability as an individually constant but interindividually variable construct. This understanding is complicated by the children's rapid developmental progression, which means that they frequently find themselves able to perform tasks that were impossible only recently.

The assessment of preschoolers' conceptions of effort and ability poses serious methodological challenges, however, because young respondents are not yet able to rate causal factors on a scale. The findings of studies presupposing this ability (e.g., questionnaire studies on control beliefs in the school context) suggest that children do not begin to distinguish between internal and external causal factors until the age of 9 years and between effort and ability conceptions of personal control

until the age of 10 years (Skinner, 1990; Skinner, Chapman, & Baltes, 1988).

Empirical Assessment of Effort and Ability Attributions Several ingenious assessment methods have been developed to examine young children's conceptions of effort and ability. Gurack (1978) explored the development of ability attributions by asking children to relate visible indicators of ability (physique, strength, height, age) to different action outcomes. She found a developmental sequence of three increasingly complex "conclusions about ability":

1. Direct conclusions drawn from a visibly relevant physical characteristic (e.g., skinniness – ability to crawl through a small hole in a wall) from the age of 3.5 years
2. Indirect conclusions drawn from a visible physical characteristic about an invisible quality (e.g., height as an index of age – height of a tower constructed) from the age of 4 years, universally present at 5 years
3. Conclusions drawn from an unknown person's previous action outcomes (consistency of competence) about his or her future performance from the age of 6 years

   The 6-year-olds based their assessments of ability primarily on consistency information (across attempts at a task), rather than on the visible physical characteristics of height or age. They did not seem to conceive of ability as a constant personal trait, however; at least, they could not articulate such a concept verbally.

Krüger (1978) examined effort attribution by having children blow cotton balls through miniature houses, a task that required careful dosage of effort. Although this procedure focused the children's experience on effort as the causal factor in success and failure, almost all of the children (3- to 6-year-olds) referred only to differences in the degree of difficulty when asked about perceived effort. The developmental primacy of difficulty attribution over competence or even effort attribution thus seems to have a phenomenological basis as well as a psychological one. Even Krüger's 3-year-old participants were able to expend effort flexibly, in accordance with task difficulty. From 5 years of age, intended effort corresponded with actual effort, and most children referred to effort when asked to explain the result attained in freely generated causal attributions.

Nicholls (1978) showed children between 5 and 13 years of age a film of two children sitting next to each other working on mathematics problems. One of the children worked consistently and diligently; the other fooled around, evidently not trying very hard. The participants were told that both children in the film got the same score. They were then asked which of the two children was smarter, why both children had got the same score even though one had tried harder than the other, and whether both children would get the same score if they both tried hard. Findings indicated that 5- to 6-year-olds do not differentiate between outcome, effort, and ability (naive covariance; see also Heyman, Gee, & Giles, 2003). Children from 7 to 9 years of age distinguish between effort and outcome but are unable to say why different effort levels may result in the same outcomes; in other words, they have not yet acquired an independent conception of ability. Between the ages of 9 and 12, children begin to differentiate between effort and ability but do not really understand the compensatory relationship between the two. It is not until the age of 12 that most children come to understand that high ability can compensate for low effort and demonstrate an awareness that effort and ability can function as compensatory causal factors (see also Sect. 16.5.4).

- Findings from several early studies using visually represented attributes of competence show that children as young as 5–6 years old can draw on competence (i.e., not differentiated into effort and ability) factors to explain differences in action outcomes. Effort attributions seem to develop earlier and more quickly than ability attributions.

However, studies that did not provide such clear visual representations of competence have found that preschool children still have very diffuse

conceptions of ability (see the overview in Dweck, 2002). When asked how they know whether another child is smart, for example, preschool children often refer to the child's friendliness and good behavior (Stipek & Daniels, 1990; Stipek & Tannatt, 1984). It seems more important for children of this age to determine whether their peers are friendly and well-behaved than whether they are competent and smart in their everyday social comparisons (Frey & Ruble, 1985). Preschool children also tend to confuse behavioral dimensions such as intelligence, good conduct, friendliness, and kindness (Heyman, Dweck, & Cain, 1992; Heyman et al., 2003; Stipek & Daniels, 1990; Stipek & Tannatt, 1984; Yussen & Kane, 1985). Stipek and Daniels (1990) found that many of the preschoolers they surveyed thought that children who are good at reading also share fairly and are able to jump higher hurdles. Moreover, preschool children's estimations of their own competence are typically also very optimistic; most children of this age believe that they are the best in their class (Beneson & Dweck, 1986).

From the age of about 7 to 8, intellectual and especially scholastic competence and achievement become the focus of attention and of social comparisons (Frey & Ruble, 1985). Children of this age develop domain-specific conceptions of ability, distinguishing between their competence in mathematics, reading, and sports, for example (Wigfield et al., 1997). They see ability as an internal quality (not just mastery of specific tasks) that is normatively defined by comparison with others. For example, Ruble et al. (1980) report that second graders, but not first graders, describe their level of intelligence in social comparison. Significantly, it is at the age of 7–8 years that children first come to see ability and personality traits as enduring person characteristics that permit long-term predictions to be made about performance and behavior (Droege & Stipek, 1993; Rholes & Ruble, 1984; Stipek & Daniels, 1990).

Findings reported by Nicholls and Miller (1983; see the overview in the next section) provide evidence for three stages in the development of conceptions of difficulty and ability.

Development of the Conceptions of Ability and Difficulty (Based on Nicholls & Miller, 1983)

- Up to about 6 years of age: Egocentric conception of difficulty; task difficulty is assessed solely in terms of the subjective experience of its demands.
- From about 6 to 7 years of age: Objective conception of difficulty (or of ability, if the task is mastered); task difficulty is assessed in terms of the objectifiable complexity of its demands (e.g., number of pieces in a jigsaw puzzle).
- From about 7 years of age: Normative conception of difficulty/ability; task difficulty is assessed in terms of the relative number of other people who succeed/fail on it.

Regarding conceptions of ability, Pomerantz and Ruble (1997) investigated several major dimensions of 7- to 10-year-olds' conceptions of ability, namely, perceived uncontrollability, stability, and capacity (i.e., ability makes it possible to succeed without effort; effort exertion leads to especially good outcomes). Whereas perceived uncontrollability remained constant across age groups, conceptions of ability as a stable causal factor increased between 7 and 9 years of age. The conception of ability as a capacity that can be moderated by effort became established between 8 and 10 years of age. Children whose conceptions of ability comprised both stability and capacity dimensions evaluated their school learning outcomes in more realistic terms (i.e., congruent with the teacher's evaluation) than did children who had mastered only one or neither of the concepts. Other studies have shown that children from the age of about 7 to 8 years take success and failure feedback into account when assessing their ability in both individual and social comparison and use this feedback information to predict their future performance (Entwistle & Hayduk, 1978; Frey & Ruble, 1985; Parsons & Ruble, 1977; Stipek & Hoffman, 1980).

In a fascinating study, Butler (1999) first determined whether fourth to eighth graders have differentiated conceptions of ability and effort and then compared their information seeking, performance, and interest in a specific task under task- and ego-involving conditions. Students who had already acquired a differentiated conception of ability showed strivings to learn and information seeking under task-involving conditions and strivings to outperform others and increased interest in social comparison information under ego-involving conditions. They responded to failure with inhibited efforts to learn, restricted information seeking, and subdued interest in the task. In contrast, students who had not yet acquired a differentiated conception of ability were very interested in social comparison information, regardless of whether they succeeded or failed on the task set. The task-involving condition was not conducive to their learning efforts, and the ego-involving condition had no inhibitive effects.

Summary

Between preschool age and second or third grade, independent conceptions of effort and ability slowly emerge from a general, optimistic, and failure-resistant conception of competence. The conception of effort seems to be more closely related to children's experience and thus easier to grasp than the conception of ability. With the transition to school, the conception of effort is consolidated and exposed to the pressures of success and failure in both individual and social comparison. For the first time, ability and effort are set in relation to conceptions of capacity and its limits. These developments lay the foundations for the development of more complex causal schemata for the explanation of success and failure and for realistic and independent assessments of personal capabilities. At the same time, they make children vulnerable to experiences of loss of control and frustration about the limits of their capabilities (see Sect. 16.6 on the development of individual differences).

16.5.3 Cognitive Preconditions for Setting Levels of Aspiration

Before moving on to the development of individual differences in achievement motivation, we first have to consider the development of two cognitively demanding aspects of achievement-related information processing:

- The level of aspiration, with its expectancy and incentive components
- Causal schemata for ability and effort

Both aspects of achievement-motivated behavior are strongly influenced by individual differences, but they also have some universal cognitive developmental prerequisites, which are discussed in this and the next section. There are two cognitive prerequisites for setting realistic levels of aspiration in the achievement domain: expectancy of success and understanding how expectancy of success and incentive value of success for a given task are inter-related.

We start by discussing research on subjective assessments of the probability of success on a given task, including work on subjective beliefs about control and behavior-event contingencies.

Estimating the Subjective Probability of Success

A fully developed conception of the probability of success presupposes a connection being drawn between two constants: personal ability (corrected for the effects of effort) and objective task difficulty (independent of personal ability and effort). Children acquire the highly complex information integration skills necessary over a long process of development. Before their conceptions of success probability are fully developed, children probably use simplified conceptions that require less complex, shorter-term, and more transparent operations. These less demanding but functional operations are based on the principle of covariation of invested competence (i.e., an undifferentiated combination of

effort and ability) and the success or failure experienced on repeated attempts at a task. Such a conclusion was already suggested by the findings of the competition study by Heckhausen and Roelofsen (1962), which found most children younger than 4.5 years to be entirely confident of winning, despite an objective probability of 50%, and older children to show signs of conflict when asked to predict the next result. In this study, competence evaluations may have been colored – and enhanced – by the children's hopes and aspirations. Yet, it may not be entirely unrealistic for young children to take an optimistic view of their capacities. Because their competence increases on a daily basis, achievement goals that were out of the question only recently may suddenly prove attainable. Besides, children's optimism about their performance reserves is by no means immune to failure experiences. In a replication of the competition study with three rates of failure (25%, 50%, and 75%), Eckhardt (1968) found that 3.5-year-olds were as uncertain in their predictions of success at a failure rate of 75% as were the older children at a failure rate of 50%. Thus, the 3.5-year-olds were also able to integrate experiences of failure over several trials and, at a failure rate of 75%, were less likely to be unshakably confident in their capabilities and (developmental) reserves.

Such expectations of success are still not very realistic, however, and they remain overly optimistic for the first decade of life. Parsons and Ruble (1977) exposed children up to 11 years of age to a series of successes or failures and examined their subsequent expectations of success. They found that children 3.5–5 years of age remained confident of success, regardless of the type and the number of successes or failures reported. Older children's interpretations of success and failure feedback became increasingly realistic. The girls were some 2 years ahead of the boys in this respect, probably because boys lag behind girls in general cognitive development. Schuster, Ruble, and Weinert (1998) reported parallel findings from a study with 5-, 8-, and 9-year-olds and college students. The authors systematically varied the information that respondents were provided on the consistency over time of a target child's performance in hypothetical failure scenarios (as an indicator of that child's ability; "When Anne played with this game in the past she did not get it right"), as well as on the performance of other children (as an indicator of task difficulty; "The other children did not get it right either").

- Significant differences in expectations of success were only observed between the 9-year-olds and the college students, indicating that it is not until adolescence that children learn to predict performance outcomes accurately on the basis of consistency and social comparison information.

Research designs in which the outcome of an action is independent of personal competence and effort make much higher demands of children's conceptions of their prospects of success. Weisz et al. (1982) report a study in which preschool children, fourth graders, eighth graders, and college students were asked to predict the success of two players, one who tried very hard and one who made very little effort, in two versions of a card game. In one version, the players chose cards completely at random; in the other ability-dependent version, they had to remember cards. It emerged that even the preschool children distinguished between different levels of effort in the ability-dependent version; like the older respondents, they predicted that the player who tried harder would be more successful than the player who made little effort. There were marked age differences in predictions concerning the chance-dependent version of the game, however. Children of preschool age and even fourth graders (although to a lesser extent) believed that players who tried very hard would be more successful than those who did not, even when the outcome was entirely a matter of chance. It was not until eighth grade (i.e., about 14 years of age) that the children seemed to understand that success on chance-dependent tasks is unrelated to effort.

Self-efficacy and Control Beliefs

Two important research traditions investigating people's expectancies about the success of their actions are Bandura's self-efficacy approach (for an overview, see Bandura, 1977, 1986) and the study of control beliefs (for an overview, see Little, 1998; Skinner, 1996; Weisz, 1983).

- According to Bandura's self-efficacy model, positive beliefs about the efficacy of one's actions in a task situation reinforce effort and persistence, thus increasing the probability of success. The more specific self-efficacy beliefs are to the task at hand, the more accurate the predictions generated by the model.

Seen from the perspective of modern motivation psychology, task-related self-efficacy beliefs – unlike the expectancies of success examined in the risk-taking model – are less a source of information on which challenges to address than motivational resources that make individuals more or less confident of success and thus provide them with more or less energy to implement their intentions (i.e., volition) in an ongoing task situation.

Conceptual models of control beliefs, which tend to apply to broader classes of action (e.g., scholastic performance in general), are more general than the construct of self-efficacy beliefs and, at the same time, more differentiated. What control beliefs and self-efficacy beliefs have in common is that they provide volitional resources for action implementation, rather than guiding task selection or goal setting. Modern approaches to control beliefs distinguish between beliefs about the contingency between causal factors and outcomes (e.g., the impact of teacher behavior on grades) and beliefs about individual access to causal factors (e.g., ability) (see Weisz, 1983; Skinner et al., 1988). An individual will consider himself or herself likely to succeed in an activity only if the following two conditions are met:

1. Success must be dependent on conditions or behaviors that people like me can control. Naive theories or beliefs of this kind are termed contingency beliefs (Weisz, 1983), means-ends beliefs (Skinner et al., 1988), or causality beliefs (Little, 1998).
2. I personally must be in the position to control these behaviors (e.g., trying hard) or be in the presence of the conditions for success (e.g., being the teacher's pet). Conceptions of this kind are terms competence beliefs (Weisz, 1983), capacity beliefs (Skinner, 1996), or agency beliefs.

Causality beliefs (means-ends beliefs) are beliefs about the controllability of certain events (e.g., getting good grades) and the means by which they can be attained (e.g., effort, ability, being on good terms with the teacher). Agency beliefs are individuals' beliefs about whether they personally have access to these means (e.g., access to personal ability or the support of the teacher).

Interestingly, research has consistently shown that overly optimistic expectations of one's general control (combination of causality and capacity) and agency have positive effects on mood, persistence (see, e.g., Weisz, 1983; for adults, see Taylor & Brown, 1988, 1994), and even school learning gains (see also the following excursus). In a 2-year longitudinal study with 8- to 11-year-olds in Germany, Lopez et al. (1998) found that children who overestimated their ability and effort (relative to two measures of academic performance) performed better over time. Contrary to expectations, no relationship was found between the magnitude of this action-control bias and school performance. However, the action-control bias was not independent of performance feedback in the form of test results – the longitudinal effects of test results on students' agency beliefs were of the same magnitude as the effects of their agency beliefs on test results. Analogous results were found in a longitudinal study with Russian 2nd to 11th graders. Not only did these students' beliefs about their scholastic ability (i.e., "agency for ability") affect their learning outcomes, their learning outcomes had an impact on their agency beliefs at a subsequent assessment (Little, Stetsenko, & Maier, 1999).

Strictly realistic assessments of personal prospects of success clearly do not enhance performance. Findings from self-efficacy research indicate that slight overestimation of self-efficacy has positive effects on the level of aspiration, effort expended, persistence, and resilience to experiences of failure (Bandura, 1977, 1986). Students of different ability levels benefit from high self-efficacy beliefs (see the overview in Pajares, 1996). They complete more tasks, show more persistence on tasks they initially found difficult, and use more effective self-regulation strategies. Pintrich and colleagues (Linnenbrink & Pintrich, 2003; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991) have reported parallel results for college students: undergraduates with higher self-efficacy beliefs use more metacognitive learning strategies, apply these strategies more frequently, and persevere for longer after experiences of failure than do students with lower self-efficacy beliefs. Schunk (1982) manipulated children's self-efficacy beliefs on division tasks by giving them feedback that enhanced self-esteem; this intervention led to improvements in the children's performance on these tasks.

Expectations of success and conceptions about one's competence inform both task deliberation (task choice, level of aspiration) and task implementation (work on tasks). A deliberative, realistic approach is required for the selection of manageable tasks. Overly optimistic expectations of success or self-efficacy beliefs would be detrimental in this context because they expose students to the risk of failure and frustration. As a matter of fact, however, there is no call for deliberative processes of task choice in school settings. Students are rarely given the opportunity to choose homework assignments or test questions. Rather, they have no choice but to work on tasks set by their teacher and can thus benefit from high confidence of success. A deliberative, realistic approach is of little help in this context. Because students are obliged to tackle the tasks set by their teacher, they are – to all intents and purposes – permanently in the volitional phase. It is hardly surprising that difficulties arise in the long term. The onset of adolescence, and the concurrent normative transition from elementary to junior high school, marks a pronounced decrease in both the confidence of academic success and the self-concept of ability. Moreover, it can be assumed that students transferring to a school type that gives them more freedom to choose between subjects see the personal significance of the various subjects in more differentiated terms and thus develop more differentiated concepts of ability in each subject. Students may exit the volitional phase for the subjects they give up, leading to a further decrease in their personal capacity beliefs. In contrast, volitional self-commitment can be expected to be maintained and perhaps even increased in the subjects in which they specialize (Köller, Trautwein, Lüdtge, & Baumert, 2006).

Interrelation Between Expectancy and Incentive

It is only when children have grasped the multiplicative relationship between the expectancy of success and the success incentive that they are able to set a level of aspiration as formulated in the risk-taking model. The available data confirm that children who understand the covariation between task difficulty and competence (i.e., from the age of about 4 to 5 years at the latest) show more pronounced responses to success (as indicators of incentive) at higher levels of difficulty (as indicators of expectation).

- The age at which these phenomena are observed depends on the complexity of the covariation information: visible representations of difficulty (e.g., a much bigger weight to lift, a jigsaw puzzle with many more pieces) are easier to grasp than inferences of difficulty drawn from comparing one's performance with that of other children.

Ruble et al. (1976) found that social comparison information did not influence the self-evaluations (children could change the expression of a cardboard face accordingly) of 6-year-olds but had a marked impact on those of 8-year-olds. Children's growing ability to process social

comparison information is also reflected in task choice, as Veroff (1969) found with a large sample of children of different ages. When presented with three different versions of a task, the majority of 4- to 7-year-olds opted for the easy task that "most children your age can do." It was not until the age of 8 years that most children preferred the moderately difficult task "that some children your age can do." The preference for this task type increased with age. Complementary relations between task difficulty and failure affect ("the easier the task, the more unpleasant the experience of failure") were not observed in the age groups investigated (up to mid-childhood).

Excursus

School-Related Control Beliefs in International Comparison

Interestingly, international and cross-cultural studies on school-related control beliefs have revealed uniformity in students' means-ends beliefs about academic success but discrepancies in their agency beliefs. In a series of studies, Little and colleagues (Karasawa, Little, Miyashita, & Azuma, 1997; Little & Lopez, 1997; Little et al., 1995, 1999) showed that children in countries as different as East and West Germany, the USA, Japan, the Czech Republic, and Russia acquire very similar conceptions about the major factors influencing academic achievement in the first 6 years of schooling. As shown in Fig. 16.6, the youngest children's (second graders') importance ratings of all causal factors are similar. As the children progress through school, their ratings of the importance of effort increase steadily, peaking in sixth grade. Importance ratings for ability remain stable, coming second in the older children's ranking after effort. Effort and ability are thus increasingly differentiated as causal factors, from almost perfect correlations in second grade to correlations of about 0.50 in sixth grade. Importance ratings for unknown causes and luck decrease steadily, with sixth graders judging luck to be comparatively unimportant for success at school. The perceived importance of teachers declines between second and fourth grade but increases again after fourth grade. Correlations between these causality-related means-ends beliefs and actual school achievement are low.

In terms of beliefs on personal agency (i.e., individual access to important causal factors),

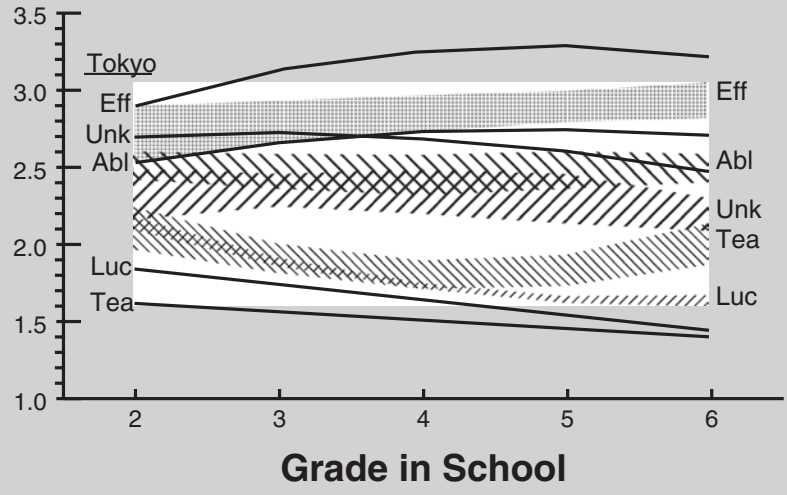

Fig. 16.6 Perceived causes of school achievement from second to sixth grade. Causes: *Eff* effort, *Unk* unknowns, *Abl* ability, *Luc* luck, *Tea* teacher. The shaded areas represent the variation measured across cultural contexts (East and West Germany, the USA, and Russia); the relatively unique trajectories for the sample in Tokyo, Japan, are superimposed on these ranges (From Little in Heckhausen & Dweck, 1998, p. 297, Part B)

however, marked differences emerged across cultures: students in the USA had higher agency estimations for effort and luck than their peers in other nations. At the same time, their personal agency beliefs showed the lowest correspondence with their actual learning outcomes (correlations between 0.16 and 0.32). Before reunification, East German children had the lowest agency beliefs, and the correspondence with their actual performance outcomes was high (correlations over 0.60, except for teacher influence at 0.36). Figure 16.7 illustrates the different patterns of relationship between students' control beliefs and actual school grades in East Berlin (in the summer of 1990; i.e., shortly before political reunification), West Berlin, Los Angeles, and Moscow. Control beliefs only predict a total of 28% of the Los Angeles students' actual school performance, compared with 63% for the East Berlin students; the figures for West Berlin and Moscow fall in between. Longitudinal follow-ups in East and West Berlin in 1991, 1992, and 1993 showed that the relationship between agency beliefs and school grades in the East Berlin students gradually decreased to the level of their peers in West Berlin as the school system was aligned to that of West Germany. The authors attributed this development to two changes in classroom practice in East Berlin schools: students were now given private, rather than public feedback on their individual performance, and group work was introduced alongside teacher-directed instruction (Little, Lopez, Oettingen, & Baltes, 2001).

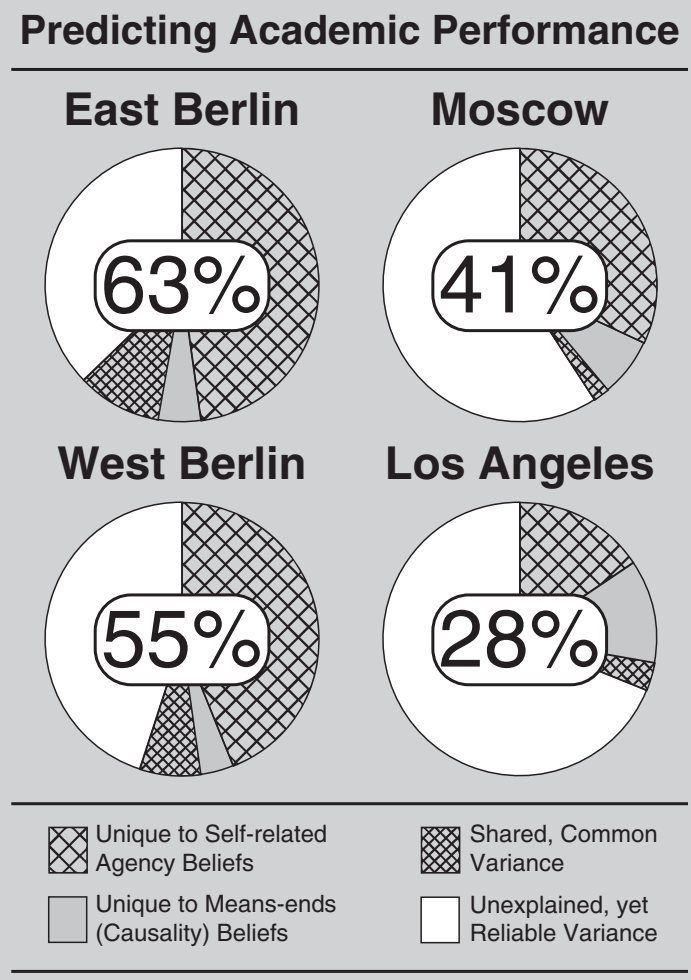

Fig. 16.7 Relationship between control beliefs and school performance in East and West Berlin, Moscow, and Los Angeles (From Little et al., 1995, p. 695, Fig. 5)

The multiplicative relationship between the expectancy of success and the success incentive seems to be heavily dependent on the salience of those two components in the situation at hand. The experience of repeated successes or failures on a single task, the difficulty of which is varied – as in the weight-lifting study (Heckhausen & Wagner, 1965) – seems to prompt even 3.5- to 4.5-year-olds to set modest levels of aspiration and to avoid very difficult tasks. In the context of new tasks or competitive situations (e.g., in the study by Heckhausen & Roelofsen, 1962), however, children tend to focus on the success incentive and to choose overly demanding goals. First indications of individual differences in the offensiveness versus defensiveness of task choice are apparent from ages as young as 4.5 years or even 3.5 years (Heckhausen & Wagner, 1965; Wagner, 1969; Wasna, 1970). Some children focus on the expectancy component, others on the incentive component, and yet others alternate between offensive and defensive choices. It is unclear whether these findings can be interpreted as first indications of individual differences in the weighting of the expectancy and incentive components or whether they simply reflect developmental shortcomings in the cognitive capacity to integrate the two.

Summary

Over the course of development, children must learn to process feedback on their action outcomes in such a way as to generate broadly realistic, but fundamentally optimistic, expectancies of success. This kind of approach is adaptive because it is not usually possible to gauge the exact probability of success, but – in the school setting, at least – it is safe for children to assume that the tasks set are not entirely beyond their capacities and that it is worth investing effort. Research shows that expectancies of success become increasingly realistic until preadolescence. For random events that are not related to ability, such as the random choice of a playing card, developmental gains are still observable even in early adolescence. Interestingly, there are marked individual and cultural differences in how closely children's expectancies of success are related to their actual learning outcomes at school, the major performance domain in childhood and adolescence. Because the developmental context of the school is determined and controlled by adults for the purposes of cultural instruction, with performance demands being set by adult socialization agents rather than chosen by the students themselves, a strictly realistic approach is not in fact necessary and might even inhibit goal striving.

16.5.4 Causal Schemata for Ability and Effort

We now return to the emergence of the ability conception and thus to the establishment of personal competence as an action incentive (Sect. 16.4). As the global competence concept gradually begins to differentiate into a conception of ability as a stable causal factor and a conception of effort as a variable causal factor, ambiguities and uncertainties arise in the causal attribution of the outcomes attained. This is because in most cases, information about effort exerted, individual ability, or task difficulty is incomplete or cannot (yet) be correctly integrated. It is impractical even – and indeed especially – for adults to take all potentially relevant information into account in their everyday decisions and behavior (see the critical discussion of Försterling's hyperrational model in Chap. 15, Sect. 15.3.3, and modern ideas of fast and frugal heuristics, Gigerenzer, 2000; Gigerenzer, Hertwig, & Pachur, 2011). Instead, adults draw on pre-built hypotheses to infer underlying causes, their relationships, and respective weighting. According to Kelley (1972, 1973), these causal schemata (see also the detailed account in Chap. 15) are used to predict ("combined covariation schemata") or causally attribute ("compensatory causal schemata") action outcomes when information is limited. Compensatory causal schemata allow success or failure to be attributed to a causal factor about which no information is available if the other factor is given (Kun & Weiner, 1973). For example, it is reasonable to assume that somebody who passes a difficult exam with flying colors despite making little effort is particularly competent. Combined covariation schemata allow success or failure to be predicted, given a rough idea of an individual's ability and the effort exerted.

- Causal schemata thus permit known outcomes to be attributed to unknown causal factors or, when the main causal factors (primarily ability and effort) are known, predictions to be made about future outcomes. Because they are, in essence, conceptions of the causal significance of effort and ability, both schemata are highly relevant to the development of achievement-motivated behavior.

Effort and ability vary in terms of both their perceived controllability (it is often possible to invest more effort, but it is much more difficult to enhance one's ability) and their affective evaluation (effort is laudable, but it is ability that we take pride in; Nicholls, 1976). Causal schemata can thus cognitively accentuate people's tendencies to be more optimistic or pessimistic in their expectancies of success or to prefer a certain pattern of causal attribution and, in so doing, can amplify individual differences over the developmental trajectory (see also Chap. 14, Sect. 14.4.1, on the attributional genesis of hopelessness and depression). The development of causal attribution schemata in childhood and adolescence is thus central to the emergence of individual differences in achievement motivation and in other domains of life and behavior. Moreover, it provides a window of opportunity for interventions, including training programs designed to modify patterns of causal attribution (Ziegler & Heller, 2000; Ziegler & Stöger, 2004).

Preliminary forms of the two causal schemata – proportionate combined covariation in the prediction of outcomes, and inversely proportionate compensation in the causal attribution of a given outcome – have been identified. One way or the other, they focus on only one of the two causal factors, effort or ability. Such one-dimensional causal attributions can easily lead to errors in the prediction or explanation of performance because they fail to consider the influence of the second factor. This shortcoming is gradually overcome; from the age of about 8 years, effort attributions no longer rigidly follow ability attributions, and from the age of about 9 years, ability can be inferred from effort information (see the overview in Heckhausen, 1982).

Empirical Findings on the Prediction of Performance Outcomes

Empirical research on the development of causal attribution schemata has investigated both the prediction of outcomes when causal factors are known and the explanation of known outcomes (see the detailed reviews in Heckhausen, 1980, 1982, 1983). We start by considering some of the major results on outcome prediction. Kun, Parsons, and Ruble (1974) informed 6- to 11-year-olds and adults about the levels of effort and ability required to solve various puzzles (three levels of each) and asked them to make predictions of success. The predictions of the 6-year-olds evidenced combined covariation; only 31% of these children still centered on effort. Whereas the combined covariation of the 6-year-olds was additive, the 8-year-olds showed signs of multiplicative variation: at higher levels of ability, the same increase in effort was predicted to produce a greater effect. Multiplicative covariation predominated among 10-year-olds and adults. In addition, effort increased in importance relative to ability with increasing age. Surber (1980) used clear visual representations of ability and effort in their study with 6-, 9-, and 11-year-olds and reported similar findings to Kun et al. (1974). In his weight-lifting prediction task, ability was illustrated by bulging muscles and effort by rectangles of different sizes. Even the 6-year-olds combined the causal factors of effort and ability in their predictions, if only additively. The predictions of the 9-year-olds and the adults were indicative of multiplicative combination of effort and ability.

Empirical Findings on the Development of Causal Explanations for Outcomes

Tweer (1976) asked children between 5 and 10 years of age to provide causal attributions for their performance outcomes on a strength task that involved hitting a platform with a hammer, causing a small wagon to slide up a vertical runway. She presented the children with hypothetical scenarios in which either effort ("The first time you don't try at all; the next time you try harder") or ability ("Your right or your left arm" or "You and your father") was varied along with the outcome. Her

findings indicate that children first learn to covary causal attributions to effort and ability with the observed outcome (i.e., if the wagon reached the top, the person must have had high ability and invested much effort). Understanding that greater effort can compensate for lower ability (e.g., a child has to try harder than an adult to get the wagon to the top) is more challenging and not mastered by children in early school age. The most challenging compensatory causal scheme is to understand that someone who achieves the same outcome with less effort has to have higher ability.

Nicholls' (1975, 1978) studies were outlined in Sect. 16.5.2. In one of his studies, Nicholls showed children between the ages of 5 and 13 films in which the effort expended did not correspond with the outcome (e.g., a child fools around and makes no effort but still finishes his mathematics problems quicker than a classmate who had worked diligently). These scenarios can only be explained by ability compensation (i.e., the first child completes the assignment quickly because he is especially clever). Nicholls' findings point to a four-stage developmental sequence, which corresponds to Piaget's sequence of development from preoperational thought to formal operations and is illustrated in Fig. 16.8:

1. Global conception of competence (around 5–6 years): an undifferentiated coupling of effort, ability, and outcome.
2. Effort covariation: effort alone causes the outcome (around 7–9 years).
3. Ability begins to be seen as an additional and autonomous cause – sometimes still coupled with effort, sometimes in the form of ability compensation (around 10 years).
4. Systematic use of ability compensation: ability can compensate for effort in inversely proportionate explanation (ability compensation) and in proportionate prediction of outcomes (around 12–13 years).

Research on the development of compensatory schemata in the explanation of outcomes when one of the two causal factors is known (cf. Karabenick & Heller, 1976; Kun, 1977; Surber, 1980; Tweer, 1976) has revealed that compensatory causal attributions are already used by younger children from the age of 6 to 10 years when the following conditions apply:

1. Compensation is required in terms of effort, not ability (someone who is less good at something has to try harder).

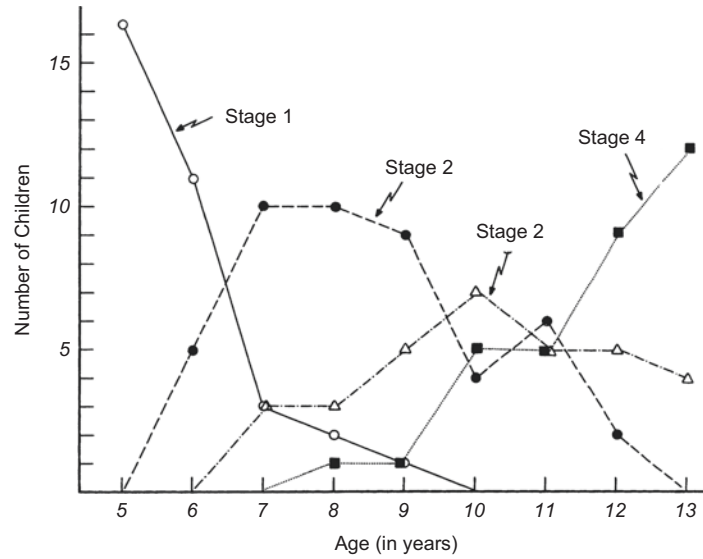

Fig. 16.8 Age trends in the development of the ability concept when the performance outcomes of two children were to be explained. The children's work activities were shown on film and contradicted a simple covariation of effort and outcome. Stage 1: global concept of competence; stage 2: effort covariation; stage 3: ability as an independent cause; stage 4: ability compensation (Based on Nicholls, 1975; from Heckhausen, 1980, Fig. 13.2, p. 661)

2. The information provided is easy to interpret (e.g., picture cues relieve working memory) and not too complex.
3. Answers are given as paired comparisons (who has to try harder?) rather than on absolute scales (see detailed overview in Heckhausen, 1983).

Summary

Causal schemata develop in the following sequence:

- Simple covariation between the effect and one cause from the age of 4 to 5 years; effort covariation precedes ability covariation.
- Combined covariation in the prediction of outcomes at age 5–6 years when both causal factors are given or two cases of unequal effort are to be compared.
- Depending on the method and the sample, effort compensation may be observable at 5 years or not until 10 years of age.
- Ability compensation is obviously more demanding and is only observed from the age of 6 to 11 years (relatively late when a preconceived ability attribution has to be revised or unequal effort clearly violates covariation with outcomes).
- Effort and ability compensation schemata develop earlier for experiences of success than for experiences of failure.

Development of Affective Differences Between Effort and Ability Attributions

Affective differences between ability and effort attributions may influence levels of aspiration, the behavioral consequences of failure, and the development of individual differences in motivation and action.

- The developmental precondition for affective differences between effort and ability attributions is that affective responses do not simply reflect the action outcome (pride after experiences of success, shame after experiences of failure) but vary depending on the causes ascribed.

This differential affective potential of ability and effort attributions has been investigated in numerous studies asking children between 6 and 13 years of age to state how a target person would feel at succeeding or failing on a task requiring high or low levels of effort and ability (Stipek & DeCotis, 1988; Thompson, 1987; Weiner, Kun, & Benesh-Weiner, 1980). In all cases, findings showed that the focus on the outcome decreased with age and that the causal factors of effort and ability came to play an increasingly important role in the emotions ascribed. By the age of 13, the respondents referred to pride and shame only when performance outcomes were attributed to ability or effort in the stories (Stipek & DeCotis, 1988). These findings are in line with earlier studies by Weiner and Peter (1973), which showed that the impact of effort attributions on performance evaluations increased with age.

- In sum, these findings indicate that instruments assuming a differentiated competence concept (i.e., a clear verbal distinction between the concepts of "effort" and "ability") are not appropriate for children younger than 10 years. From the age of about ten, when children have mastered effort and ability compensation as well as simple effort covariation, effort becomes the decisive factor in evaluating the achievements of others. It is at this point that children overcome the coupling schema (effort = ability) and are no longer bound to conclude that success deriving from high ability must be attributable to high effort as well.

Regarding affective differences in self-evaluation, Heckhausen (1978) exposed children between 10 and 13 years of age (i.e., the critical age range for the acquisition of effort and ability compensation) to a series of successes or failures. The more these fifth to seventh graders attributed success feedback to their ability, the more satisfaction they reported. Effort attributions had no effect on self-evaluation. Other studies (Nicholls, 1975; Ames, Ames, & Felker, 1977) confirm the impor-

tance of ability attributions for self-evaluations from the age of 10 to 11 years upward. First signs of individual motive differences were detected in children's self-evaluations after experiences of failure: negative self-evaluations were found to be associated with effort (in success-motivated individuals; Heckhausen, 1978), with ability (Schmalt, 1978), or with neither of the two (Nicholls, 1975). In a study with children of a similar age, Miller (1985) found that only 11- to 12-year-olds who had already developed a full self-concept of ability (i.e., who were aware that the ability level determines the effects of effort) responded to a series of failures in anagram tasks with performance decrements in a subsequent shape-sorting task.

Different observer perspectives can also have differential effects. For adults, effort is the decisive causal factor in evaluations of others, and ability is the decisive causal factor in self-evaluations. Others are evaluated more highly if they have invested effort, but people tend to see cause for pride in their own achievements if they testify to high ability. In a nutshell, "effort is virtuous, but it's better to have ability" (Nicholls, 1976, p. 306). Ability attributions of failure are problematic because they imply that future attempts have little chance of success either, at least when ability is seen as stable and unchangeable. In contrast, effort attributions of failure spur the individual to try again, investing more energy and care this time to ensure success. We return to the implications that these patterns of causal attribution have for the development and amplification of individual differences in Sect. 16.6.3, Sect. 16.6.4 (cf. Dweck, 2002; Heckhausen, 1984).

16.6 Development of Individual Differences

In the past two decades, conceptual development in the field of motivation psychology, and indeed psychology in general, has seen a move away from a strictly cognitive focus toward a perspective that also takes affective dynamics into account. Motivation psychologists now know more and are, at the same time, in the midst of an exciting phase of discovery as to the interactions of implicit and explicit motives, the functions of intrinsic and extrinsic incentives, the cognitions adapted to different action phases (e.g., self-efficacy or causation), and the development of "hot" and "cool" executive functions (Zelazo & Carolson, 2005) that enable behavioral regulation in the first place. The development of individual differences cannot be explained solely in terms of cognitive factors such as levels of aspiration or causal attribution styles, neither can it be clarified by an exclusive focus on how differences in the incentive value of success and failure emerge over the course of socialization.

McClelland's comparison of self-attributed (explicit) and implicit (not consciously represented) motives can serve as a useful organizing framework for an overview of research on the development of individual differences in achievement motivation (McClelland, Koestner, & Weinberger, 1989; see detailed discussion in Chap. 9). There is much evidence to indicate that implicit motives (measured by projective tests) and explicit motives (measured by self-report questionnaires) are two independent motive systems that govern different types of behavior and that may be activated in concert or in opposition depending on the situation. Implicit motives are activated by incentives residing in the activity itself (e.g., to improve one's performance, to master a challenge) and thus generate motivation for more spontaneous behavior that is not prestructured by the environment: the activity itself is attractive to people with a strong motive (e.g., achievement motive), independent of its outcomes. Explicit motives, in contrast, are activated by social incentives (social recognition, reward, status) and thus determine prestructured behavior in socially regulated situations, such as the classroom, where the contingencies for social incentives are transparent (e.g., I have to do my homework carefully to please the teacher and get a good grade).

In this section, we begin by outlining the main strands of research on individual differences in

children's motivational processes. These include research approaches focusing on:

- Implicit motives
- More or less explicit incentives and expectancies
- Explicit goal orientations
- Processes of action regulation

In a second step, we discuss developmental processes that can influence individual differences in achievement motivation at critical phases and transitions, present the available empirical findings, and outline perspectives for future research.

16.6.1 Implicit Motives

The foundations for the development of implicit motive strength are laid in early childhood, before verbal instructions and self-reflection give motivational processes the deliberative character that distinguishes higher cognition (Heckhausen, 1980, 1982; McClelland, 1987; Veroff, 1969). Although achievement-motivated behavior comprises both affective (implicit) and cognitive (explicit) processes – in modern terminology, "implicit" and "explicit" components of achievement-motivated behavior – the preverbal development of individual differences in the incentive value of success and failure is decisive. It is at this early stage that children develop a heightened, probably lifelong sensitivity to situational conditions affording them the opportunity to develop and optimize their control of the environment (of objects in the case of achievement motive and of other people in the case of the power motive) or that threaten to reduce or restrict that capacity.

Influence of Parenting on the Development of Implicit Motives

Consensus has not yet been reached on the contextual conditions that promote this individual sensitivity and readiness to act. Longitudinal data are scarce, and results have been mixed. The findings of a longitudinal study by McClelland and Pilon (1983) provide some valuable insights, however. The authors followed up on a 1950s study on parenting styles by Sears, Maccoby, and Levin (1957), using TAT and questionnaire measures to assess the affiliation, power, and achievement motives of the "children," who were now in their early 30s.

- Parenting behavior was not found to reliably predict the affiliation motive. Parental behavior and influence did, however, predict the development of the power motive and especially the achievement motive.

The children whose mothers had reported that aggressive and/or sexualized behavior on the child's part was tolerated in the home environment developed a strong power motive. If the father was the dominant influence in the child's upbringing, a strong power motive with activity inhibition emerged (also termed "imperial power motive" or "socialized power motive" by McClelland); if the mother was the dominant influence, an uninhibited power motive was observed (termed "conquistador syndrome" or "personalized power motive" by McClelland, and "Don Juan complex" by Winter, 1973). Further, McClelland and Pilon (1983) found that mothers of boys who had high TAT achievement motive scores at age 30 had insisted on fixed mealtimes and been particularly strict about toilet training. These two influences of early parenting behavior cannot be attributed to the effects of parental strictness or punishment in general: neither of these factors was related to the sons' achievement motivation scores at age 30.

It is difficult to interpret these findings without knowing anything about potential mediating processes between childhood and the age of 30. When the mothers were surveyed in the 1950s, it was – in contrast to current practice – generally considered good parenting to get children used to fixed mealtimes and to begin toilet training as soon as possible; indeed, these challenges were seen as normative developmental tasks for the first and second year of life. In other words, mothers who were particularly ambitious in this respect believed – and indeed expected – their children to be capable of achieving these devel-

opmental milestones well within time. They therefore generated interaction contexts, even in the preverbal period, in which positive and negative affect was expressed in response to success and failure on self-control tasks (e.g., "Don't ask for food before mealtimes"). Interestingly, the mothers' expectations for school achievement and other early achievement-related outcomes did not predict their children's achievement motives in adulthood. The socialization effects identified by McClelland and Pilon operate on the purely implicit motive level (see also the discussion of these findings in Chap. 9, Sect. 9.2.4).

A more recent reanalysis of McClelland and Pilon's materials aimed at uncovering precursors in the socialization of 5-year-olds that determine how congruent implicit and explicit motives are in 31-year-olds (Schattke, Koestner, & Kehr, 2011). The authors expected a substantial influence of the individual's degree of early self-determination on the later congruence between the implicit and explicit motives (see Chap. 9 on motive congruence; see also Hofer et al., 2010). The study found that children, who had had conflicts regarding their autonomy and relationship with their mothers at age five, were more likely to develop incongruent implicit and explicit motives as adults.

A number of cross-sectional studies have also investigated how various socialization variables, parenting practices, and aspects of independence training are related to implicit motive strength in later childhood or adulthood (see the overview in Heckhausen, 1980, 1982; for a more recent review, see Eccles et al., 1998, and Trudewind, Unzner, & Schneider, 1997; see also the following excursus). Winterbottom's (1958) early and influential study extended the findings presented by McClelland and Pilon to children of school age. Mothers of 8-year-old boys high in achievement motivation were found to endorse more requirements for independence and competence than mothers of boys low in achievement motivation, particularly for the age range of 5–9 years. Interestingly, these relatively early maternal expectations were not limited to the reliable execution of routine tasks (e.g., getting dressed) to relieve the mother but included child-centered competence requirements that fostered the child's independence in task choice and execution. Like the requirements for early self-regulation of food intake and excretion identified by McClelland and Pilon, these competence requirements in the early school years may be features of the family environment that foster the development of the achievement motive. In subsequent studies, however, the features identified by Winterbottom failed to predict the achievement motive in adolescence (Feld, 1967) or in different social classes (Rosen, 1959) and religious orientations (Smith, 1969), casting doubt on the validity of her findings. Some studies even found negative relations between very early expectations of independence and the tendency to approach success (Hayashi & Yamauchi, 1964; Bartlett & Smith, 1966; Teevan & McGhee, 1972).

In the 1970s, a number of studies (Reif, 1970; Heckhausen & Meyer, 1972; Schmalt, 1975; Trudewind, 1975) taking a more systematic approach to parents' expectations of competence and independence confirmed Veroff's (1969) hypothesis that it is not the earliness but the developmental adequacy of independence demands that promotes the development of a success-oriented achievement motive. Figure 16.9 presents findings from studies by Reif (1970), Trudewind (1975), and Schmalt (1975), showing that child-centered independence training is associated with higher success motives and lower failure motives when it occurs neither early nor late in the child's development. Measuring the earliness of maternal expectations in terms of the child's intelligence level, Heckhausen and Meyer (1972) found a direct relationship between excessive maternal expectations and sons' fear of failure. We return to positive and negative effects on the development of motivation in childhood in Sect. 16.7.5.

16.6.2 Specific Incentives and Expectancies

The risk-taking model (Atkinson, 1964) assumes anticipated self-evaluation to be the crucial incentive motivating achievement-oriented behavior. As such, the implicit motive compo-

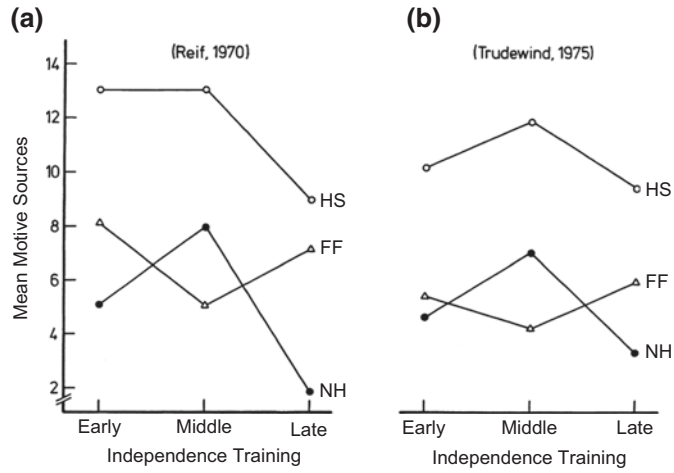

Fig. 16.9 (**a**, **b**) Mean motive scores (*HS*, hope for success; *FF*, fear of failure; *NH*, net hope: HS–FF) as a function of timing of mothers' child-centered independence training in fourth grade (*left*: Reif, 1970) and fourth and fifth grades (*right*: Trudewind, 1975) (Based on Meyer, 1973, p. 181; Trudewind, 1975, p. 122)

Excursus

Change in Implicit Motives Across the Lifespan

To date, only a few isolated studies and research groups have investigated change in implicit motives across the lifespan. Veroff, Reuman, and Feld (1984) reported two large-scale studies in which TAT scores for the achievement motive, affiliation motive, hope for power, and fear of weakness (fear component of the power motive) were obtained from US men and women of different ages and educational backgrounds in the years 1957 and 1976. The overall picture was one of great stability across age groups, but three clear patterns of change did emerge:

1. Women showed a steady decrease in the affiliation motive across young (21–34 years), middle (35–54 years), and older (55 years and above) adulthood. This finding applied to housewives and working women, to married and single women, to mothers, and to women without children (Veroff et al., 1984). The authors reasoned that membership of a peer group, and the reassurance it provides, is crucial for women in young adulthood but becomes less important as they grow older and increasingly confident in their life choices. Nevertheless, the affiliation theme still seems to have a strong influence on the psychological well-being of older women. Halisch and Geppert (2001a) found that the absence of affiliation-related (but not achievement- or power-related) life events is associated with reduced life satisfaction in 65- to 85-year-old women. In contrast to Veroff, Franz (1994) reported an increase in the affiliation motive over time in both women and men between 30 and 40.
2. *According to cross-sectional comparisons reported by Veroff*, the achievement motive of older women is weaker than that of younger and middle-aged women (Veroff et al., 1984). However, careful analysis revealed that this decline applied only to TAT stories generated in response to career-related picture cues (e.g., two women in a laboratory). No age differences were found in stories that involved measuring one's competence in a specific

(continued)

task against a standard of excellence. This finding is in line with the hypothesis that extrinsic and competitive forms of achievement motivation gradually cede to intrinsic and task-oriented forms over adulthood (Maehr & Kleiber,1981). Moreover, Franz (1994) found longitudinal evidence for a decrease in the achievement motive between the ages of 31 and 41. One recent cross-sectional study is a notable exception as it found a stronger achievement motive in older (54–86 years) than in younger (18–32 years) adults (Valero, Nikitin, & Freund, 2015).

3. Men in middle adulthood express more hope for power than young or old men (Veroff et al., 1984). In a study with elderly twins, however, Halisch and Geppert (2001b) found that men's power motive continued to increase even in the seventh decade of life, remaining stable in the eighth and ninth decade. Accordingly, even in old age, power-related life events remained more relevant to men's life satisfaction than achievement- or affiliation-related life events.

nents hope for success and fear of failure, and their relations to the other important motives of power and affiliation, are the only individual characteristics capable of having an impact on achievement-oriented behavior in Atkinson's model (McClelland, 1985). It soon became clear, however, that achievement-motivated behavior cannot comprehensively be explained in terms of an approach vs. avoidance achievement motive and task difficulty. Eccles showed, for instance, that the gender differences frequently observed in individual preferences for certain school subjects cannot be explained by the risk-taking model (Eccles, 1984, 1987; Eccles, Adler, & Meece, 1984; Eccles, Wigfield, & Schiefele, 1998).

- Rather, the choice of subjects and tasks is influenced by the confidence a student has in his or her abilities and by the value of a particular course choice. A wealth of incentives, such as congruence with gender-specific behavioral norms and with the self-concept, and the perceived attitudes of socializers and peers are thus involved in achievement-related choices.

As described elsewhere, numerous incentives residing in the action itself, its outcomes, and the internal and external consequences of those outcomes (see the extended cognitive model of motivation in Chap. 14) influence the choice of achievement-related (and other) activities and the investment of resources in selected goals. Eccles' (2005) general expectancy-value model of achievement choices, presented in Fig. 16.10 (see also Eccles & Wigfield, 2002), provides an overview of the many factors and incentives influencing achievement-related choices.

- A major difference between the Eccles and Wigfield model and the risk-taking model is that Eccles and colleagues do not assume the "objective" difficulty of a task (in social comparison) to be the decisive motivating factor (according to the risk-taking model, the more difficult a task is, the higher its attraction) but predict group and individual norms to determine the subjective value of an activity (e.g., how desirable it is for a girl to do well in mathematics, sports, essay writing, football, or cheerleading).

Another factor that Eccles (2005) assumes to influence the value of achievement-related choices is their potential costs. These include the anticipated threat to self-esteem of failure, the possible negative implications of discrepancies from the self-concept or group norms (e.g., if a girl decides to play football), and the opportunity costs incurred by deciding for one activity and against another. An individual's final choice depends less on the absolute value of an activity than on its relative, subjective value compared with alternatives that must then be abandoned. Empirical findings from a longitudinal study with school leavers show that the values attached to occupational characteristics (e.g., helping others)

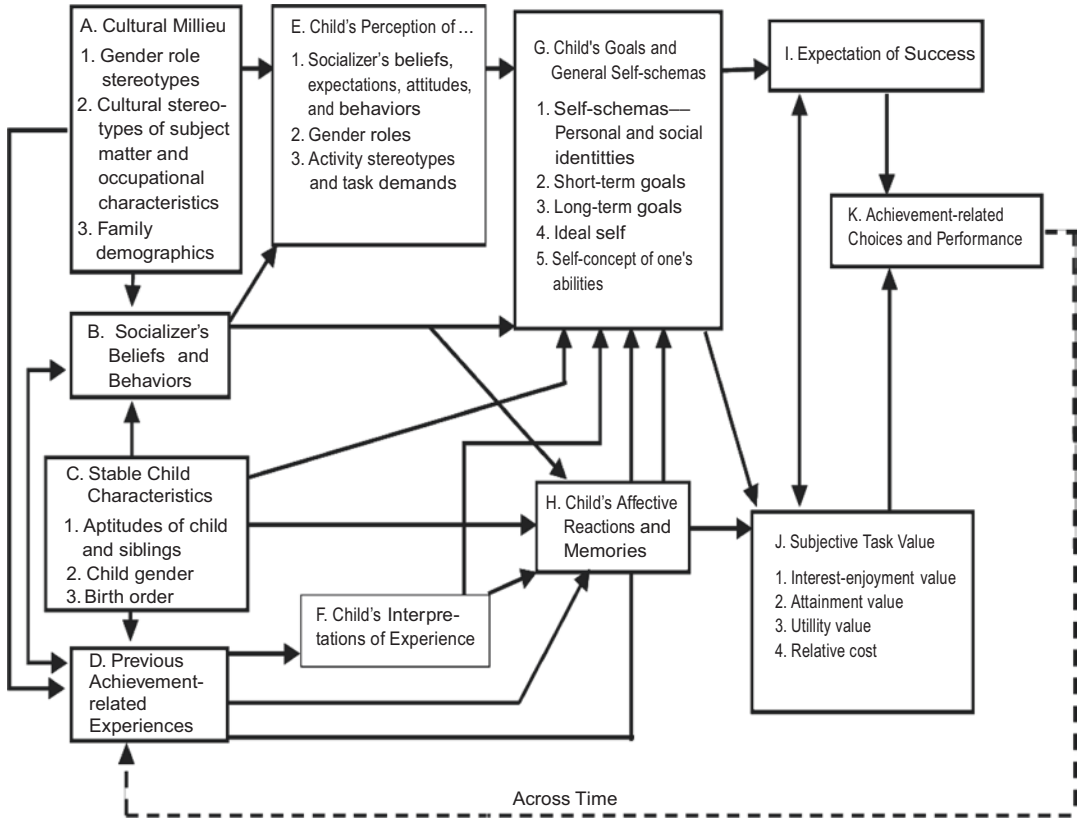

Fig. 16.10 Eccles' general expectancy-value model of achievement choices (From Eccles, 2005)

not only predict plans to enter certain occupations (e.g., nurse, doctor) but also predict not aspiring to others (e.g., natural scientist, business-related profession; Eccles, 2005; Eccles, Barber, & Jozefowicz, 1999).

Furthermore, in the Eccles and Wigfield model, the expectancy component (i.e., subjective difficulty) is shaped over time by the individual's experiences and preferences. Students who decide against advanced mathematics and physics courses, for example, in favor of literature and theater studies, will soon feel at home in the world of literature and drama but have little confidence in their mathematics and physics skills.

- The Eccles and Wigfield model emphasizes change in individual preferences and achievement-related cognitions over time and the impact of that change on long-term competence profiles. The model might thus be described as a dynamic, interactive, and inherently developmental psychological approach. The choices an individual makes over time help shape both subjective and objective influences on achievement-motivated preferences, thus leading – "for better or worse" – to canalized development that increasingly accentuates existing differences between individuals or subgroups (e.g., girls vs. boys, different social classes or ethnic groups; Heckhausen, 1999; Heckhausen & Schulz, 1999).

The Eccles and Wigfield model straddles a middle position between implicit and explicit motives. On the one hand, the authors (Eccles, 2005; Eccles & Wigfield, 2002) emphasize that

there are both conscious and nonconscious components to students' achievement-related value orientations (e.g., culturally mediated value orientations). On the other hand, the research inspired by the model typically uses self-report questionnaires to assess these values and interprets findings as reflecting on self-concepts (Eccles, Wigfield, & Schiefele, 1998).

Further empirical findings from the research program by Eccles and Wigfield are discussed in Chap. 6 in the context of achievement-motivated behavior (see Excursus under 6.4.4), in Chap. 17 in the context of developmental regulatory behavior, and in Chap. 18 in the discussion of academic performance. The construct of interest is also worth mentioning in the context of activity-specific incentives, less from the perspective of self-determination (Krapp, 1999; Krapp, Hidi, & Renninger, 1992) than in terms of the differing attraction that particular topics (mathematics, sports, animals) hold for different individuals (see also the discussion in Chap. 13). Some important empirical findings on interest development are also discussed in Sect. 16.6.5, in the context of canalizing effects in the development of individual differences in motivation.

16.6.3 Generalized Goal Orientations

The concepts considered in this section are more clearly localized on the side of explicit motives. They relate to the explicit goals pursued in achievement-oriented behavior, the goals that respondents can report on relatively spontaneously (i.e., without first having to construct an answer). In the past 20 years, research on the development of achievement-related motivation has focused almost exclusively on explicit achievement goals (conscious, reportable goals; see the overview in Eccles et al., 1998). Accordingly, attention has been centered on cognitions of personal efficacy and competence and on causal attributions of success and failure. This kind of approach is particularly suitable for the investigation of achievement motivation in school settings – achievement-related behavior in the classroom is highly structured, tends to be evaluated in social comparison, and has far-reaching social consequences (recognition of adults and peers, access to higher education and prized careers). Expectancies relating to these action-event consequences are typically both consciously represented and extrinsically motivated.

Learning/Mastery Goals vs. Performance/Ego Goals

In the late 1970s, a group of researchers including Carol Ames, Carol Dweck, Marty Maehr, and John Nicholls began to exchange ideas on achievement motivation in regular colloquia at the University of Illinois. The new and convergent conceptualizations (see the overview in Elliot, 2005) that they developed became known as the achievement goal approach.

- Subsequent research on the development of achievement motivation, especially in the field of educational psychology, was strongly influenced by the models of Nicholls and Dweck, in particular. These achievement goal models were originally conceptualized to account for both situation- and person-dependent variation, but the focus has increasingly shifted to individual differences in achievement goal orientations, particularly in recent research developments.

Based on his findings on the emergence of differentiated conceptions of ability and effort from a global concept of competence, and their coordination within causal schemata (see also Sects. 16.6.2 and 16.6.4), Nicholls (1985) hypothesized two contrasting goal orientations: an undifferentiated competence or mastery goal orientation ("task involvement") and a specific performance or ego goal orientation ("ego involvement").

The aim of mastery goals is to improve one's knowledge and skills, master material, and learn new things; the aim of performance goals is to demonstrate one's competence relative to others with as little effort as possible. These two goal orientations lead to contrasting patterns of behavior in achievement situations:

- Mastery goals are intrinsically motivated; they promote behaviors (e.g., choice of tasks of intermediate difficulty), affect (e.g., joy at success), and cognitions (e.g., learning strategies) conducive to optimizing task mastery.
- Performance goals are extrinsically motivated; they are geared to maximizing favorable evaluations of the self and thus elicit less adaptive behaviors (e.g., choice of extremely easy or difficult tasks), affect (e.g., fear of defeat and shame), and cognitions (e.g., causal attributions of failure that threaten self-esteem).

Dweck drew a similar distinction, having approached the issue from another perspective, namely, her work on the helplessness of older school-aged children in achievement situations. In a series of studies, Dweck and colleagues found that, from the age of around 10 to 12 years, children of the same ability level show contrasting responses to failure (Diener & Dweck, 1978, 1980; Dweck, 1975; Dweck & Leggett, 1988; Dweck & Repucci, 1973). Children who see ability as variable and malleable ("incremental theory of intelligence"; Dweck, 1999), and who thus typically seek to enhance their ability in achievement situations (learning goals), respond to failure by attributing the disappointing outcome to insufficient effort, increasing their effort and persistence and remaining confident of success. In contrast, children who consider ability to be a stable quantity that is relatively difficult to influence ("entity theory of intelligence"; Dweck 1999), and who thus tend to pursue performance goals, show helpless responses to failure, attributing the outcome to a lack of ability, reducing their effort and persistence, becoming less confident of success, and lowering their level of aspiration.

These contrasting responses to failure are reflected in children's general approaches to achievement situations:

- Children with a learning goal orientation or a growth mindset see achievement situations as opportunities to master challenges and to enhance their knowledge and skills.
- Children with a performance goal orientation or a fixed (ability) mindset tend to interpret achievement situations as tests of their ability.

Whether this test situation is experienced as threatening or stimulating depends on whether the children consider themselves competent of accomplishing the task (see also the findings of Spinath & Stiensmeyer-Pelster, 2003; Stiensmeyer-Pelster, Balke, & Schlangen, 1996). If their expectations are positive, children high in performance goal orientations aim to demonstrate a high level of ability in order to maximize positive self- and other-evaluations.

If not, they try to conceal their lack of ability (e.g., by not trying at all or by choosing less demanding tasks).

Ames and Archer (1988) called for research to go beyond goals and concepts of intelligence to see mastery/learning and performance/ego goal orientations as cognitive-emotional networks of goals, beliefs, and feelings relating to success, effort, ability, failure, feedback, and evaluation standards (see also Stiensmeyer-Pelster et al., 1996) by integrating their own approach with those of Nicholls and Dweck. Their take on explicit motivational issues thus approaches the levels of complexity and multifunctionality (e.g., for prospective and retrospective, success- and failure-oriented achievement situations) that have been conceptualized for implicit motivational issues (McClelland, 1985).

- With its focus on optimizing efficiency of task execution, the concept of learning or mastery goals has much in common with intrinsic achievement motivation and can be seen as an explicit counterpart to the implicit achievement motive. In contrast, the concept of performance goals focuses on extrinsic consequences of actions (i.e., self- and other-evaluation of an individual's competence and characteristics). Individuals tend to be higher in one goal orientation than the other, with the dominant goal orientation determining the choice of goals and other aspects of achievement-oriented behavior, unless overruled by strong

situational activation of the nondominant goal orientation (Stipek & Kowalski, 1989).

Numerous studies on the achievement goal approach have confirmed that a learning goal orientation (i.e., a focus on mastering task demands and improving one's competence) has positive effects on long-term achievement behavior under a broad variety of learning and achievement conditions. This usually does not apply to actual performance outcomes (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). In contrast, a performance goal orientation has positive or neutral effects when conceptions of personal competence are positive but negative effects when conceptions of personal competence are negative (see the overview in Harackiewicz & Elliot, 1993; Koestner, Zuckerman, & Koestner, 1987; Miller & Hom, 1990; Sansone, Sachau, & Weir, 1989) and when the individual feels exposed to public evaluation (see, e.g., Witkowski & Stiensmeyer-Pelster, 1998). In the school context, the individual achievement goal orientations interact with the goal orientations established in the particular classroom and can thus have context-specific influences on student behavior and achievement (Murayama & Elliot, 2009). For example, Senko, Hulleman, and Harackiewicz (2011) argue that a learning goal orientation might potentially optimize in-depth learning whose outcomes cannot be detected with the comparatively superficial tests tailored to normative comparisons (i.e., performance-oriented goals such as grades). Findings also indicate that a combination of learning and performance orientations may be particularly motivating (Elliot, 2005) in the workplace (Farr, Hofmann, & Mathieu, 1993), in sports settings (Fox, Goudas, Biddle, Duda, & Armstrong, 1994), and even in educational contexts (Ainley, 1993; Daniels et al., 2008; Wentzel, 1989).

The motivational value of multiple goal orientations may depend on the individual's ability to activate each at the right moment, thus optimizing the motivational fit with the situational potential for achievement and the potential costs of failure (see also Rheinberg's, 2006, concept of motivational competence Sect. 14.7). Butler's (1999) empirical findings show that adolescents are already able to respond to situational conditions by showing incentive-specific strivings, either to master a task or to outperform others. This kind of situation/goal orientation fit hypothesis could prove very productive in future research.

Approach vs. Avoidance Goals

In the early 1990s, Elliot pointed out that research on performance goal orientations had overlooked an important aspect of traditional achievement motivation research, namely, the distinction between approach and avoidance or, to use the terminology of implicit motive research, hope for success vs. fear of failure (see comprehensive review in Elliot, 2008). The approach-avoidance dimension was expected to be particularly relevant to performance goals, regardless of self-assessed competence:

- At high levels of self-attributed competence, individuals can be expected to choose approach goals, whether mastery oriented (improving one's knowledge and skills) or performance oriented (demonstrating one's competence to others).
- At low levels of self-attributed competence, the focus is likely to be on the risk of failure and hence on the goal of avoiding public displays of incompetence (Elliot & Church, 1997). Which goal orientation emerges in a given situation evidently depends on individual preferences and vulnerabilities (motive-dependent incentive weighting of success and failure), on the situational opportunities for success and risks of failure, and on the individual's perception of these opportunities and risks, which is – to a certain degree – motive dependent (Elliot, 1997).

Elliot later extended his trichotomous model of mastery-approach goals, performance-approach goals, and performance-avoidance goals to include mastery-avoidance goals, resulting in a full 2×2 achievement goal model (Elliot, 1999; Elliot & McGregor, 2001). When pursuing

mastery-avoidance goals, individuals seek to avoid loss or stagnation of competence, forgetting what they have learned, failing to complete a task, or misunderstanding things. Mastery-avoidance goals are probably less common in scholastic contexts and in the first two decades of life than they are in older adulthood, when people struggle with losses in cognitive capacity, particularly in situations with high and multiple demands (Heckhausen, 2005).

Numerous empirical studies (see the overviews in Harackiewicz, Barron, & Elliot, 1998; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Moller & Elliot, 2006) have tested Elliot's trichotomous model and 2×2 achievement goal model in the domains of education, sports, and employment and substantiated the distinction between approach and avoidance goals for both mastery and performance goals. Performance-avoidance goals (i.e., not revealing oneself to be incompetent) have proved particularly detrimental for achievement outcomes. Furthermore, a host of studies from the United States have found that performance-approach goals (i.e., demonstrating one's competence) are especially conducive to achievement in school and college contexts, whereas mastery-approach goals often seem to have no positive effects on academic achievement (see the overview in Harackiewicz et al., 1998).

Summary

Concepts of generalized goal orientations (i.e., explicit motives) have come to dominate US research on the development of motivation in the past 20 years. Distinctions are made on two dimensions: learning/mastery vs. performance/ego and approach vs. avoidance. The aim of learning or mastery goals (also referred to as growth mindset) is to improve one's competence; the aim or performance or ego goals (also referred to as fixed mindset) is to demonstrate one's competence to others and in social comparison. Learning and mastery goals have positive effects on achievement-oriented behavior but not on the outcomes attained. Performance and ego goals can induce helplessness in achievement-related contexts at low levels of self-attributed competence. A combination of mastery and performance goals can be particularly motivating under favorable conditions.

Goals can also be distinguished in terms of whether their aim is to approach a desirable action outcome or its consequences or to avoid an undesirable action outcome or its consequences. The approach vs. avoidance orientation determines whether performance/ego goals, in particular, are conducive or detrimental to achievement-related behavior. Goals aiming to minimize displays of incompetence tend to elicit effort avoidance and helplessness responses, especially after failure and when people are exposed to the judgments of others. If the assessment of personal competence is favorable, however, the striving to demonstrate that competence is conducive to effort, and to choosing ambitious, but attainable, levels of aspiration.

16.6.4 Differential Developmental Pathways: Critical Phases, Life-Course Transitions, and Universal Developmental Milestones

In this section, we outline four important factors that trigger and amplify the development of inter-individual differences in motivation and volition, and show how universal motivational development affords opportunities for individual differentiation and canalization of developmental trajectories, while leaving ample scope for plasticity and intervention. Although a wealth of empirical data have been collected on the development of motivation, many of the conclusions drawn to date must remain speculative, and there is considerable potential for further empirical research. Nevertheless, the data available show that a number of life-course transitions and developmental contexts canalize and accelerate development, intensifying both general and differential motivational development, and thus foster qualitative leaps where general, incremental growth had previously been assumed.

Influence of Parent-Child Interaction on Implicit and Explicit Motive Development

Parental interactional behavior is critical to the development of both implicit motives in early childhood and more explicit components of achievement-motivated behavior, such as self-evaluation and levels of aspiration, in the further developmental trajectory (preschool and school age).

In their comprehensive, cross-cultural psychobiological research program, Keller and colleagues (see the overview in Keller, 2000, 2012) identified key dimensions of parental behavior that represent major sources of interindividual variance in early, preverbal, and thus implicit influences. Parents, and especially the primary caregiver (usually the mother), provide infants with their first causal experiences.

- Irrespective of the cultural context and parenting style (Keller, 2016; Keller, Lohaus, Völker, Elben, & Ball, 2003), mothers show contingent responses toward the infant's cues (e.g., the greeting response at eye contact; Papoušek, 1967). This behavioral contingency is clearly a defining characteristic of a biologically predetermined, naturally occurring parenting program.

Keller, Lohaus, Völker, Cappenberg, and Chasiotis (1999) found only slight individual differences in the reliability and latency of mothers' responses to their infants' signals but marked individual differences in the communicative channel used (i.e., visual vs. verbal). These differences in the dominant channel of contingent parental behavior and differences in the reliability, frequency, and latency of contingent parental behavior that may emerge later (in interactions with postinfancy children, when the influence of evolutionarily determined parenting programs declines) can help explain individual differences in the development of generalized contingency awareness (Watson, 1966).

The affective tone of parent-child interactions is another potentially decisive factor in the development of individual differences in motivation. Various research approaches assume the affective tone (or "warmth"; Keller, 2000; Keller et al., 2003) of the interactional exchange between the primary caregiver and the infant to be an early, preverbal, and nonconscious basis for children's sensitivity to positive and negative affect (Kuhl & Völker, 1998; see also Chap. 12) and thus for the development of general approach vs. avoidance tendencies (Higgins & Silberman, 1998, on the development of promotion and prevention focus). Keller et al. (2003) also found that warmth in maternal interaction behavior is not dependent on maternal attitudes to parenting but seems to be just as implicit (preconscious) as the regulatory differences that it may foster in infants.

A crucial point in the development of individual differences in motivation and volition is the gradual transfer of regulatory responsibilities from others (in small children, from the parents, see Vygotsky, 1978; see overview in Holodynski, Seeger, Hartmann, & Wörmann, 2013) to the self. In adaptive mother-child interactions, maternal expectations for child self-regulation and maternal provision of external regulation are closely attuned to the child's current developmental level (Heckhausen, 1987a, 1988).

Parents have also been found to expect and support growing self-regulation of children's self-reinforcing responses to success. Lütkenhaus (1984) observed that 3-year-olds whose mothers displayed positive affect in response to their successes showed more frequent self-evaluations in a second phase of mother-child play. In a longitudinal study of 1-year-olds, J. Heckhausen found that children whose mothers had praised the correctness of task action at an early stage of development showed objector even self-related success responses to successful outcomes (e.g., building a tower) at follow-up 2 months later (Heckhausen, 1988). A similar form of maternal support for the development of motivational self-regulation was observed for "wanting to do it oneself," which closely follows mothers' first refusals to provide help in longitudinal development (Heckhausen, 1988). Unlike contingent parental responses toward infant signals, these and similar aspects of parental behavior are consciously accessible and

can thus be assumed to be more responsive to interventions.

In these transitions from other-regulation to self-regulation at different stages of development, it is crucial that the adult assesses the child's developmental status accurately, rather than on the basis of the child's chronological or apparent age (Heckhausen, 1987b). There may be considerable discrepancies between implicit and explicit levels of aspiration when children are consistently over- or underchallenged because of their height. If early developmental conditions are favorable (contingency and warmth of parental behavior), these children may show an approach orientation when acting on their own initiative (when the implicit motive is aroused) but a strong avoidance orientation in response to external performance demands (when the explicit motive is aroused). Empirical studies have yet to investigate these relationships.

In their extension of PSI theory, Kuhl and Völker (1998) proposed an integrative perspective on the aspects of parental behavior, experiences of control, affective climate, and transition from other- to self-regulation discussed previously. The authors suggested that the association of early expressions of self-efficacy with the affective warmth experienced in parent-child interactions leads to the development of distinct personality styles and disorders. When parental behavior is characterized by positive affect, but low contingency toward the infant's cues, for example, self-expressions cannot be associated with the reward system. The long-term effects of this dissociation, according to Kuhl and Völker, are a decreased capacity for autonomous self-regulation and inhibited access to the self-constituting extension memory, resulting in a fixation on external rewards, such as social recognition or material values, at the cost of intrinsic motives. Kuhl and Völker assume an early dissociation of negative affect and self-regulation to have corresponding effects. Specifically, an early interaction climate characterized by negative affect (e.g., irritability of the mother, frequent separation) that affords the infant little or no opportunity to terminate negative experiences by means of its own behavior (e.g., expressing negative affect such as fear, thus eliciting a reassuring response from the mother) weakens the connection between the system regulating negative affect and the self-system. According to Kuhl and Völker, the infant then becomes helpless and dependent on outside help to downregulate negative affect.

What is the empirical evidence for parental influences on the development of the achievement motive? As children develop, the implicit potential of the home environment to stimulate achievement-related behavior begins to play a role, as do the explicit expectations that parents make of their children. In detailed interviews with the parents of fourth graders, Trudewind (1975) investigated the home and family factors influencing the development of achievement motivation and sought to organize these factors within a taxonomy. A broad range of variables were used to assess three major dimensions of the developmental ecology of the family:

- Potential for intellectual and achievement-related stimulation (e.g., scope of potential experiences; stimulation afforded by toys, arts and crafts, books, and pets; help with homework assignments; intensity of speech training; variety of social contacts; frequency and quality of parent-child interactions)
- Parental achievement pressure (e.g., expectations for scholastic achievement, homework control, sanctions for school grades)
- The child's cumulative experience of success and failure

It emerged that the higher the potential for intellectual stimulation in the family environment, and the earlier parents allowed their children freedom to make decisions, the lower the boys' fear of failure. However, a combination of high intellectual and achievement-related stimulation in the home and high parental achievement pressure proved particularly unfavorable for motivational development. Children in this kind of home environment are evidently exposed to all too frequent, negatively sanctioned experiences of failure. In less intellectually stimulating

households, high parental expectations were not found to foster fear of failure.

- Home environments giving children plenty of opportunity to try out their competence independently seem particularly conducive to the development of a success-oriented achievement motive. Generalized personal standards appropriate to the current developmental status are able to emerge as children interact with the environment without parental achievement pressure. The weight of parental other-evaluations and the detrimental effects they have when children are over- or underchallenged are thus moderated at an early stage, as children develop implicit motive systems based on self-regulation and self-evaluation.

In a 4-year longitudinal study with the entire cohort of children entering grade 1 in the German city of Bochum, Trudewind and colleagues assessed the characteristics of the home environment specified in their taxonomy at three points of measurement. Findings showed that the general achievement-related stimulation potential of the home environment continued to covary with the development of a success-oriented implicit achievement motive during the elementary school years (Trudewind, 1982a, 1982b, 1987) and that parents' academic expectations, control of schoolwork, and sanctions increasingly influenced the development of failure orientation (Trudewind, Brünger, & Krieger, 1986; Trudewind & Windel, 1991).

Finally, parent-child interaction can be assumed to play a key role in the childhood development of behavioral regulation strategies (Heckhausen & Schulz, 1995; Brandtstädter, 2001). Through subtle control of task-related interactions, parents can involve their child in goal-oriented behavior if a task matches the child's developmental level or, if a task is too difficult, either help the child or distract it from the task (Heckhausen, 1987a, 1988). The child thus learns to "switch" from goal engagement to goal disengagement, depending on the controllability of goal attainment (e.g., the developmental adequacy of the task), and parental other-regulation gradually cedes to self-regulation. The longitudinal study by Lütkenhaus, Grossmann, and Grossmann (1985) described in the next section (see Study box) provides interesting insights into the effects of infants' predispositions and parental interaction styles in early childhood.

Study

Effects of Infants' Predispositions and Parental Interaction Styles in Early Childhood

Lütkenhaus, Grossmann, and Grossmann (1985) studied the relations between infants' orienting ability, maternal cooperation when playing with the child at age 3 years, and situational adequacy of the 3-year-olds' effort regulation during a tower-building competition. Three-year-olds who had shown greater orienting ability as babies proved better able to downregulate their effort when lagging behind in the tower-building task. Three-year-olds whose mothers were particularly cooperative in play situations proved better able to increase their building speed when they were about to win. These findings suggest that an innate capacity for reorientation (goal disengagement in the case of failure), on the one hand, and maternal action optimization (optimization of success striving), on the other, foster the development of regulatory behavior that corresponds to the demands of the situation (acceleration when success beckons, deceleration when failure looms).

Parental behavior and explicit parental instruction may also influence the secondary control strategies that can help buffer motivational resources against the negative effects of failure. Parents may teach their children – either by model learning or by direct instruction – to bear in mind that other children did not necessarily do very well either (strategic social comparison) or to focus on extenuating circumstances (self-serving causal attributions), thus communicating a preference for particular secondary control

strategies (Heckhausen, 1993). As yet, however, the conditions under which interindividual differences in control strategies, behavioral regulation strategies, or motivational competence emerge (Rheinberg, 2006) have not been the subject of empirical study.

Summary

The early developmental conditions of implicit and explicit motives are complex, and many pieces of the puzzle are still missing. Three major dimensions of parental behavior, and their fit with the child's developmental status, are particularly influential in early childhood:

- The contingency of parental responses toward the infant's cues
- The warmth and affective tone of the interactional exchange
- The developmental adequacy of (parent-initiated) transitions from other-regulation to self-regulation

The achievement-related characteristics of the family environment continue to play a decisive role throughout childhood. Developmental ecologies combining high potential for stimulation and experimentation with autonomy support and low parental achievement pressure are particularly favorable to the development of an implicit achievement motive. In this kind of family environment, children are encouraged to set themselves challenges that are within their capabilities, to master those challenges, and, in so doing, to become confident of succeeding in a wealth of achievement domains. As yet, little is known about how parenting practices promote or inhibit the development of flexible behavioral regulation strategies that facilitate the switch from goal engagement to goal disengagement or the acquisition of secondary control strategies for dealing with failure.

Transition to Explicit Social Reference Norms at School Entry

In this section, we examine the effects of the school setting on the development of achievement motivation. Unlike the home, the school context is a developmental environment in which other-regulation and other-evaluation are institutionalized as the dominant conditions stimulating achievement-related behavior. Despite attempts to promote individualized and autonomy-supportive instruction, the school context, as an institution of general education, is by definition determined by norm-oriented instruction and performance evaluation.

Children do not typically choose what they are taught at school, which assignments to do for homework, or which skills to master for a class test. It is not up to them to decide between tasks of different difficulty levels. Rather, it is the teacher who sets the level of aspiration by specifying certain achievement goals (which tasks will I try to master?).

Consequently, students' levels of aspiration at school typically relate to their aspired grades, that is, to other people's evaluations of their achievement. These other-evaluations are defined by social rather than individual standards of comparison. Although all children make learning gains over the school year, only those who improve their relative position in the class can actually improve their grades. Even if grades are not given in the first years of schooling, it is impossible for the parties involved – teachers, students, and parents – to ignore the salience of social comparisons in everyday school life. Parents want to know how well their child is doing relative to his or her classmates. Teachers cannot help classifying their students as good, poor, or mediocre. Children soon learn whether they are one of the "good" or the "bad" students in a class, even if this assessment is not made explicit in grades in the first years at school.

- At school entry, social reference norms suddenly become extremely relevant to children's evaluations of their achievement.

The lack of freedom for students to choose their own tasks and set their own levels of aspiration, along with the dominance of social reference norms, make the school an inhospitable developmental ecology for the implicit achievement

motive. There are few opportunities for students to select achievement-related activities independently, and intraindividual comparison (e.g., have I improved?) is difficult, if not impossible. Other-evaluation is dominant and may even cancel out the incentive effects of anticipated self-evaluation and the enjoyment of engaging in an activity, especially when grades have important long-term implications (e.g., for admittance to vocational training or higher education). Apart from influencing the development of explicit performance motives (e.g., aspired grades), these factors can also have adverse effects on the development of the implicit performance motive, leading to the emergence of strong fear of failure or patterns of helplessness (Dweck, 2002) and stress response (Lewis & Ramsay, 2002). The influence of negative preconditions (e.g., slight developmental delays relative to peers) on motivational development may be amplified at school entrance, meaning that the children in question soon lag even further behind their classmates. The longitudinal study by Trudewind and Husarek (1979) described in the next section (see Study box) provides valuable insights into this amplification of negative developmental influences at the critical transition to school.

Study

School Entry, Parental Behavior, and Consequences for Children's Hope for Success and Fear of Failure

As part of the Bochum longitudinal study on the development of the achievement motive at elementary school age, Trudewind and Husarek (1979) investigated how parental influences on the development of the motive's approach and avoidance components are amplified at school entry. Their observation study, which was carried out in the first half of the second grade, showed how parent-child interactions at home can be influenced by the transition to school, with favorable or detrimental effects on motive development. Of the 3,465 children participating in the longitudinal study, the authors selected two groups of 20 boys who did not differ with respect to demographic or other ecological characteristics or intellectual development at school entry or in terms of their school grades in second grade. The boys selected were not strongly motivated by either success or failure when they started school, but their motive strengths differed dramatically by the end of first grade. The boys in one group had developed a strong success motive; those in the other group had acquired a strong fear of failure. The two groups' motives had clearly developed in diametrically opposed directions over the first year of schooling. So, what had happened? What had triggered this divergent motive change in boys whose backgrounds seemed so similar? The authors sought answers to these questions by examining an ecological key situation at the transition to school, namely, mother-child interactions as children worked on their homework. In this context, implicit motive tendencies that have developed at home in infancy and preschool age collide with the explicit performance demands of the school on a daily basis. The mothers' approach to this critical situation during this vulnerable period proved decisive for the boys' motive development. Mothers whose children developed a strong fear of failure during their first year at school differed from mothers whose children became increasingly confident of success in the following respects:

1. They tended to apply social rather than individual or objective reference norms, had higher levels of aspiration for their child, and were less satisfied with the child's homework performance, although the report card grades of the two groups did not differ.
2. They were more likely to structure and control the homework situation and granted the child little freedom to make

his or her own decisions. They gave less encouragement, and their support – although more frequent – took the form of direct intervention rather than indirect pointers that respected the child's independence (see also the findings of Rosen & D'Andrade, 1959).
3. In an interview, they were less likely to attribute their child's homework success to ability and more likely to attribute failure to lack of ability. In the homework situation, they were more likely to criticize their child for lack of ability or effort and to ascribe success to the ease of the tasks.
4. They responded neutrally to success and were less likely to provide praise or encouragement but were more likely to criticize or scold the child when outcomes were poor.

Through a detailed analysis of an ecological key situation, Trudewind and Husarek (1979) succeeded in identifying socializing influences that can explain the divergent patterns of motive change observed at the transition to school. Because the boys' achievement motives did not differ when they began school, it seems reasonable to assume that school entry is a critical phase for motive development. It is possible that the mothers' interactions with their children did not differ markedly before school entry (although no data are available to confirm this). It was only when external levels of aspiration based on social comparison were adopted in the school setting that achievement pressure and negative other-evaluations of failure were introduced to the home environment as well. Some mother-son pairs did not allow these outside influences to affect their hope for success- and learning-oriented interactions; in others, the fear of failure became dominant. A strong failure motive is often associated with the development of explicit performance goals that focus on minimizing negative other-evaluations and that lead to helpless patterns of failure avoidance rather than to efforts to improve competency levels, even more so after failure (see the overview on learning and performance goals in Sect. 16.7.3; for details, see Dweck, 2002).

Teachers are another major factor in the emergence of dominant fear of failure. Rheinberg and colleagues found considerable differences in the reference-norm orientations of elementary school teachers and showed that a preference for individual versus social comparison has significant implications for students' motive orientations and learning motivation (Rheinberg, 1980; Rheinberg, Schmalt, & Wasser, 1978). Children in classes whose teachers tend to apply social reference norms are more afraid of failure, experience higher test anxiety and generalized anxiety, and express higher levels of school aversion. Fortunately, such negative effects are restricted to aspects of the self-concept that rely on social comparisons and do not influence other aspects, such as personal control beliefs and primary control strategies (Marsh, Trautwein, Lüdtke, & Köller, 2008). Even those aspects of the self-concept that are affected by a superior social context do not appear to be irreversibly impaired. A series of intervention and training studies with teachers have shown that students systematically exposed to individual (i.e., myself compared to myself earlier) reference norms in the classroom become more confident of success (Rheinberg & Krug, 2005). A training program in which parents were taught to encourage their (third-grade) children to apply individual reference norms, set realistic goals, and make self-serving causal attributions (Lund, Rheinberg, & Gladasch, 2001) had similar effects. The third graders showed an increase in the approach component of the achievement motive and more realistic levels of aspiration on both the short and the long term (6 months after the intervention).

Another consequence of the focus on social comparison standards and standardized levels of aspiration in the school context is that children are no longer motivated to develop realistic expectations or to set appropriate task-related goals. Rather, the teacher sets the same tasks for all students. This arrangement fosters unrealistically

high expectations that have little to do with task difficulty and that are only loosely related to the children's scholastic achievement. This trend is particularly pronounced in the school-related self-efficacy beliefs of children in the United States (Little, 1998; Little et al., 1995; see also Excursus under Sect. 16.5.3), most likely promoted by the cultural norm of high positive self-esteem that has gained increasing currency in recent decades (Twenge & Campbell, 2008).

However, the standardized achievement goals of the school developmental context, based as they are on a social comparison and value system, also fulfill important regulatory functions. The school domain is determined by explicit, extrinsic achievement goals, such as earning good grades, pleasing the teacher, and getting good qualifications to improve one's chances finding of a high quality apprenticeship or earning a place on a sought-after undergraduate program at a good university. Performance-approach goals such as these, which focus on other-evaluations, social comparison, self-representation, and grades, are better predictors of learning outcomes (grades) than are mastery-approach goals (e.g., learning to understand the material better), which predict interest in the subject (Harackiewicz, Barron, Tauer, & Elliot, 2002; see also Schöne, Dickhäuser, Spinath, & Stiensmeyer-Pelster, 2004, on the relationship between mastery and performance goals and individual vs. social reference norms).

- Explicit achievement goals are needed to regulate the pursuit of worthwhile goals (Barron & Harackiewicz, 2001; Harackiewicz et al., 1998) with long-term developmental consequences for socially regulated educational and occupational careers (Heckhausen, 1999; Heckhausen & Schulz, 1999). Furthermore, volitional pursuit of explicit achievement goals can compensate, at least in part, for adverse developments in implicit motives (see also Brunstein & Maier, 1996, and Chap. 9). Ensuing experiences of success may, in turn, have favorable effects on the development of implicit motives (e.g., reduced fear of failure). Moreover, explicit achievement goals give the implicit achievement motive a structured field of activity by helping attune the equivalence class of achievement-relevant situations to individual skills and abilities, values, personality characteristics, and interests.

In this context, the research group led by Eccles and Wigfield (Eccles, 2005; Eccles et al., 1998; see also Sect. 16.6.2 and the excursus on "School Performance and the Expectancy-Value Theory of Achievement Motivation" in Sect. 6.4.4) has shown that membership of a group (e.g., gender Eccles, Adler, & Meece, 1984 or youth subgroup) has considerable effects on the achievement-related values, expectations of success, and self-concepts that develop during middle childhood (13–14 years, transition from elementary to junior high or middle school) and especially early adolescence (15–16 years, transition to high school), thus focusing the achievement-motivated behavior of children, adolescents, and finally adults on certain domains (e.g., languages and arts for girls), often at the cost of others (e.g., mathematics, science, information technology). This individual differentiation in the contexts that elicit students' achievement motive corresponds with institutional opportunities to drop certain subjects and specialize in others in secondary and postsecondary education in the industrialized world. Interindividual differences are further emphasized here, leading to increasingly divergent developmental trajectories of motivational investment and even different professional careers (Eccles & Wang, 2016).

The object- or school-subject related differentiation of achievement-motivated behavior includes the development of interests. Object-related interests probably begin to emerge with early preferences for physical objects or the world of people (Roe & Siegelman, 1964), continue with gender role identification (Ruble & Martin, 2002), and go on to determine educational and occupational decisions in adolescence and young adulthood. These decisions are based partly on gender roles (Eccles, 1987; Gottfredson, 1981) but increasingly reflect adolescents' idiosyncratic

self-concepts, subgroup affiliations, and personal aspirations for achievement and upward social mobility. In a study with seventh to ninth graders (junior high school), MacIver, Stipek, and Daniels (1991) found that changes in students' conceptions of their ability in different subjects predicted corresponding changes in interest much better than the other way around.

Summary

The transition to school exposes children – and, indirectly, their parents – to an achievement context that is dominated by other-regulation and other-evaluation, social comparisons, and extrinsic incentives. Expectations and evaluations are strongly standardized, leaving little scope for the implicit, self-regulated achievement motive and its focus on intraindividual improvement. At the same time, explicit achievement goals, social comparison and competition with peers, and long-term, extrinsic consequences for educational and occupational careers suddenly become extremely relevant. Children exposed to repeated experiences of failure, parental autonomy suppression, and parental achievement pressure can soon develop chronic fear of failure. However, explicit achievement goals also serve important regulatory functions. For most children, motivation is optimized over the course of development by a combination of implicit and explicit achievement motives. Explicit achievement goals also serve to attune the equivalence class of achievement-relevant situations to individual skills and abilities, values, personality characteristics, and interests.

Consequences of Cognitive Differentiation for Achievement-Related Beliefs

The two examples presented in the following illustrate how cognitive development can amplify or, in some cases, reduce interindividual differences in achievement-motivated behavior.

The first example concerns the differentiation of conceptions of competence and self-esteem in different domains of behavior. Determining factors here are, first, the ability to distinguish causal conceptions of ability and effort (Sect. 16.5.2) and, second, the emergence of domain-specific incentives and expectancies (Sect. 16.6.2). Significant progress in these respects is seen between preschool age, when dimensions such as intelligence, good conduct, strength, and friendliness are still confounded (see the overview in Dweck, 2002), and the elementary school years. From 7 or 8 years of age, notions of intellectual and academic competence begin to emerge from a diffuse conception of competence and self-esteem and are even differentiated according to school subjects (Wigfield, Eccles, Yoon, & Harold, 1997). A stable conception of ability, adjusted for differences in effort, does not begin to develop until the age of 9 years at the earliest (Nicholls, 1978; Tweer, 1976). In other words, competence and self-esteem are distinguished, and the conception of intellectual competence is further differentiated, long before children have developed stable concepts of ability. Accordingly, children's early, diffuse ideas of their value or lack thereof (Heyman et al., 1992) cannot simply be transferred to their conceptions of intellectual and scholastic competence. The increasing cognitive differentiation of different achievement domains makes children more resilient to generalized conceptions of competence that, if negative, can induce helplessness and resignation (Dweck, 1999). Instead, children exposed to failure in one domain can focus on their successes in other domains, thus protecting their self-esteem (see Heckhausen, 1999, on self-protective secondary control strategies).

- Despite the availability of these mechanisms for shielding motivational resources, less able children and/or children experiencing developmental delays remain vulnerable to long-term damage to self-esteem once a stable conception of ability has developed. They are at risk of attributing failure to the stable factor of low ability, the potential consequences of which are avoidance of challenges and failure, impaired self-esteem, and resignation.

A second example of a process of cognitive differentiation that has implications for the development and amplification of interindividual differences in achievement-motivated behavior is the acquisition of patterns of causal attribution. Heckhausen (1984) proposed a detailed developmental model describing the emergence of preferred causal attributions of success or failure. The model postulates a number of stages in the development of two contrasting patterns of causal attribution: positive attributional style and depressive attributional style.

This approach converges with related research programs (see also Chap. 15 Sects. 15.3.4 and 15.4.2) on internal vs. external control (Rotter, 1966), depression (Abramson, Seligman, & Teasdale, 1978), learned helplessness in school students (Dweck & Repucci, 1973), low self-concept (Ames, 1978; Nicholls, 1976), and fear of failure (Heckhausen, 1977). Individuals with a positive attributional style attribute success to the stable, internal factor of high personal ability and failure to a lack of effort or task difficulty. Individuals with a depressive attributional style, in contrast, attribute success to external (e.g., the test was easy), variable (e.g., I was lucky), and specific (e.g., the teacher explained this task type particularly well) causes and failure to a lack of ability.

What are the conditions associated with the development of fear of failure? The foundations for the development of this pattern of causal attribution are laid in preschool age, when children start to show preferences for patterns of causal attribution that leave high ability attributions intact (e.g., I didn't manage the task because it was too hard even for me) or, in the case of a depressive attributional style, attributions of low ability. Even at this early stage, the former attributional pattern encourages children to continue selecting challenging tasks and making as much effort as possible, whereas the latter prompts them to lower their level of aspiration and reduce effort investment. When children start school, social reference norms become more salient, accelerating the development of a more stable conception of ability and inverse-compensatory patterns of causal inferences about the role of ability and effort in known achievement outcomes (Sect. 16.5.4). Differences in the fear of failure and in helplessness seem to develop particularly quickly during this transitional period, not least under the influence of parents who have a strong social reference-norm orientation and who see their child's ability in stable and negative terms (Hokoda & Fincham, 1995; Trudewind & Husarek, 1979). After the first few years at school, most 10- to 11-year-olds have developed either a positive or a depressive attributional style, and the corresponding beneficial or detrimental influences on their achievement-motivated behavior are apparent. Thus, normative cognitive development leads to individual differences in causal attribution really taking effect, with consequences for behavior that cause further divergence in the differential developmental trajectories of success- vs. failure-oriented children. Because attributional patterns are consciously accessible, however, they may provide a means of influencing expectancies and behavior in targeted interventions. In other words, they may offer an opportunity to positively influence the implicit motive system by way of the explicit motive system. Weinberger and McClelland (1990) argued that intervention programs could capitalize on the fact that the cognitive system is more explicit and modifiable and has an impact back on the implicit system. Therapeutic interventions may thus be able to increase the congruence between implicit and explicit motive systems.

The amplification of individual differences prompted by the acquisition of compensatory causal schemata has another detrimental consequence for competence and achievement motivation, namely, effort avoidance. If effort investment in a given action outcome is indicative of low ability, children and adolescents might decide that it is a better idea to avoid effort – or at least to give others the impression of not having tried (see also Jagacinski & Nicholls, 1990, on the concept of "self-handicapping"). For example, Covington and Omelich (1979) found that undergraduate students report low-effort investment after failure and consider failure after effort

investment to be particularly embarrassing and indicative of inability. However, Jagacinski and Nicholls (1987, 1990) concluded that, although retrospective attributions of failure to a lack of effort are widespread, there is no evidence for strategic reductions in effort as a means of protecting self-esteem against these kinds of attributions. Their findings indicate that strategic effort reduction occurs only when social comparison information about other people's performance and effort is salient (Jagacinski & Nicholls, 1987) – as is often the case in the classroom. Students who use effort avoidance as a strategy to buffer self-esteem may become increasingly disengaged in achievement situations and, as a result, increasingly marginalized in terms of motivation and missed learning opportunities.

Summary

Normative developments in cognitive differentiation may accelerate the development of interindividual differences or help reverse them. They thus offer points of intervention for training programs and developmental plasticity. The differentiation of conceptions of ability and effort, as well as the development of domain-specific incentives and expectancies, makes children more resilient to overly general self-appraisals of their competence and characteristics. At the same time, these developments allow conceptions of ability as stable and potentially low to emerge in the first place. The normative development of more complex patterns of causal attribution can make ascriptions of failure to low ability seem inevitable, exposing children to the risk of helplessness and to increased fear of failure. Development in the available patterns of causal attribution can thus consolidate and amplify individual differences by means of cognitive canalization, sometimes leading to resignation. Finally, individuals may use effort avoidance to color others' perceptions of their competence, acting as though an outcome has been attained despite low-effort investment, and can thus be ascribed to high ability. This kind of strategy can be expected to have negative consequences for both motivation and the acquisition of knowledge and skills.

Increasing Independence in the Orchestration of Action Opportunities and Contexts of Development

The increasing independence that children, adolescents, and adults have to orchestrate their action opportunities, levels of aspiration, and contexts of development across the lifespan can also amplify existing interindividual differences. This section leads directly into the next chapter on the motivation of developmental regulation and is thus kept brief.

The normative development of control behavior (or primary control striving) progresses from dominant other-regulation in infancy to high levels of self-regulation (see Vygotsky, 1978; overview by Holodynski et al., 2013) in social institutions (school, college, workplace, family, etc.). Parents are the first (co)producers of experiences of self-efficacy (Sect. 16.2). In granting – and indeed expecting – increasing independence in children's problem-solving behavior and achievement-oriented behavior in general, they have a decisive influence on the development of achievement-motivated behavior and the associated positive and negative emotions (Sects. 16.2 and 16.6 Study First Day of School; see the overview in Trudewind et al., 1997).

With increasing age, partly prompted by their parents, but partly on their own initiative ("wanting to do it oneself"; Geppert & Küster, 1983), children begin to actively strive for independence in their achievement-oriented behavior. In addition, with the gradual expansion of the developmental-ecological life space (Bronfenbrenner & Morris, 1988) from the home to the neighborhood, and later to the school and to recreation sites, children are exposed to new and more diverse influences and, at the same time, play an increasingly active role in selecting social contexts and interaction partners. This increasing involvement in the orchestration of opportunities, social relations, and networks – in other words, developmental contexts – is associated with the stabilization and accentuation of conscious and unconscious preferences, values, beliefs, and self-images (Lang & Heckhausen, 2002). Young people's life goals and developmental goals become increasingly individualized, leading to

divergent developmental trajectories that become increasingly stable, unique, and irreversible as a result of developmental canalization.

This brings us to the transaction between the individual and the developmental ecology, which Heinz Heckhausen sought to address with his call for an "explanation of behavior at fourth glance" (Heckhausen, 1980; see also Chap. 1). From the perspective of action theory and developmental psychology, more can now be said – in specific terms – about this transactional relationship. This is the objective of Chap. 17, which examines the dynamic interaction between biological and societal opportunity structures and individual developmental regulation.

Summary

It is as a function of the progressive shift from other- to self-regulation that interindividual differences really begin to take effect on the developmental trajectory. Beginning in parent-child dyads in early childhood, this development gradually extends to other developmental ecologies as the child gets older and plays an increasingly active role in choosing developmental opportunities and contexts within the framework of what is biologically and socially possible. This increasing self-regulation leads to progressive divergence in individual developmental trajectories and to differences in motive dispositions, values, and goals becoming increasingly stable and less reversible with age.

Review Questions

1. *What is meant by the functional primacy of primary control striving?*

   The striving to exert primary control on the environment is a universal and fundamental characteristic of human motivation. It is a product of behavioral evolution and has been observed in various mammals and nonmammalian species.

2. *How does the potential for primary control change over the lifespan?*

   The potential for primary control describes an inverse U-shaped trajectory across the lifespan. It begins at a very low level at infancy, increases rapidly in childhood and adolescence, peaks and levels out in early to middle adulthood, and declines in old age, especially advanced old age.

3. *Does control striving develop gradually, or is it already present in neonates?*

   Newborn babies already show a clear preference for behavior-event contingencies. They repeat behaviors that regularly lead to certain events (e.g., presentation of a milk bottle), even in the absence of consummatory interest in that event (i.e., when they are satiated), and show positive affect when an expected event occurs as a result of their behavior.

4. *How does the ability to focus on an intended action outcome develop?*

   Toward the end of the first year, children gradually begin to distinguish between actions and action goals. During the second year, their attention comes to focus increasingly on the outcomes of their actions. Different action outcomes pose an increasing challenge to children's mental capacity: First sudden, discrete effects; then continuous, action-accompanying effects; and finally state-related outcomes in multistep activities.

5. *What are the main emotional incentives for achievement-oriented behavior, and what is their order of development?*

   The main incentives for achievement-oriented behavior are pride and shame:

pride is manifested in an upright posture, smiling, and triumphant eye contact with the loser, whereas shame is expressed in slouching, lowering the head, and avoiding eye contact with the winner. Pride develops first, in the second and third year; shame is not observed until the end of the third year or until the fourth year.

6. *What is meant by the phenomenon of "wanting to do it oneself"?*

   "Wanting to do it oneself" is observed in the second year, as the self-concept develops. It is at this point that the child begins to reject adults' offers of help or interference in their activities.

7. *What are the benefits and risks of self-evaluative responses?*

   The major benefit is anticipated positive self-evaluation, which motivates achievement behavior. The major risk is attribution of failure to a personal lack of ability, which may inhibit future achievement behavior.

8. *How can people avoid negative self-evaluations after experiences of failure?*

   Negative self-evaluations can be avoided by applying strategies of compensatory secondary control. Preschoolers are already able to use simple compensatory secondary control strategies (e.g., denying failure, self-distraction). More complex compensatory strategies, such as switching to another goal and self-serving attributions, are not developed until adolescence.

9. *What role do parents play in the early development of action?*

   Parents (especially mothers) are the source of the first behavior-event contingency experiences, intentionally or unintentionally providing contingent responses to the infant's behaviors (e.g., eye contact, opening the mouth). The parent-child bond offers a secure base from which to explore the environment. In the second year, actions are initiated and regulated in natural object-related parent-child interactions. It is within this apprenticeship framework that the child gradually acquires the competence to act independently.

10. *Which concepts must children grasp before they can engage in mature achievement-motivated behavior in the classic sense?*

    They must be able to distinguish task difficulty and personal competence as independent factors, to apply individual and social reference norms, to distinguish the ability and effort components of the global conception of competence (and thus generate expectancies of success), to grasp the multiplicative relationship between the expectancy of success and the success incentive (and thus set appropriate levels of aspiration), and to use compensatory causal schemata to infer the causes of success and failure.

11. *What are the "big fish little pond" effect and the effect of "reflected glory"?*

    According to the "big fish little pond" effect, the students' self-assessed abilities depend on the overall level of performance in their class or school. If the performances of others in the social reference frame of class or school are comparatively low, students feel like big fish in a little pond and perceive their own performances as relatively high. In contrast, high performances in the comparison group lead to comparatively low self-ascribed abilities. The "reflected glory" effect comes about by the individual identifying with a group that exhibits superior performance.

(continued)

12. *Which cross-cultural differences and similarities have been found in children's school-related control beliefs?*

    Empirical data show uniformity in causality (means-ends) beliefs in the school context. Students' ratings of the importance of effort increase steadily until sixth grade and are consistently higher than the corresponding ratings for ability. Cross-national differences have been found in students' perceptions of their personal capacities (agency beliefs). Students in the United States have the highest agency beliefs, but the association between these beliefs and their actual learning outcomes is the weakest in international comparison.

13. *What are the affective consequences of effort and ability attributions of success and failure in school-age children?*

    Ability attributions are associated with positive affect in the case of success and with negative affect in the case of failure; effort attributions have much less of an impact on affect.

14. *Which interactive behaviors, parenting practices, and home environments are conducive to the development of an approach-oriented achievement motive?*

    Parental behavior that is contingent with the child's behavior, emotional warmth, developmental adequacy of independence requirements, child-centered independence training, and a stimulating home environment that affords children diverse opportunities to test their competence on their own initiative.

15. *How does the general expectancy-value model of achievement choices proposed by Eccles and Wigfield differ from Atkinson's risk-taking model?*

    Self-evaluation is not the only motivating (value-giving) factor in the Eccles and Wigfield model. Rather, the value component is assumed to be influenced by task-intrinsic and instrumental incentives, as well as by the costs of goal pursuit. Both the value and the expectancy components are assumed to be influenced by the norms and beliefs of social and cultural subgroups, as well as by individual self-concepts.

16. *What is the achievement goal approach?*

    Conceptual models and research programs relating to explicit achievement motives (i.e., achievement goals) have become known as the achievement goal approach. These research programs distinguish achievement goals on one or both of two dimensions: (1) learning or mastery goals vs. performance or ego goals and (2) approach vs. avoidance goals. Learning/mastery goals and approach goals are preferable to performance/ego goals and avoidance goals in many but not all achievement conditions. In many real-life achievement contexts, it seems advisable to combine different goal orientations flexibly.

17. *How does the transition to school affect the development of achievement-motivated behavior?*

    The school context emphasizes other-regulation and other-evaluation by the teacher, social comparisons with peers, and extrinsic incentives. This focus is rather unfavorable for the development of implicit achievement-motivated behavior, particularly when children are exposed to frequent experiences of failure and parental achievement pressure. The development of explicit achievement goals is fostered at school, however, and can facilitate the development of a flexible and multifaceted repertoire of achievement-motivated incentives.

18. *Which normative developments in the ability to make differentiated causal attributions can aggravate the negative effects of experiences of failure and thus induce helplessness?*

    The development of a stable concept of ability that is independent of effort and compensatory causal attributions of the role of ability and effort in known outcomes.

19. *As a function of which development do interindividual differences really begin to take effect on the developmental trajectory, especially in adolescence and adulthood?*

    The progressive shift from other- to self-regulation, as the individual starts to play an active role in shaping his or her developmental ecology.

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