



The Motivation of Developmental Regulation

17

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This chapter is the counterpart to the research on the development of motivation presented in Chap. 16, as it investigates the motivation of development and thus rounds out a dynamic, interactive perspective on the interaction between motivation and development. It is only recently that the part individuals play in actively regulating their own development across the lifespan has emerged as an important theme on the research agenda, particularly in lifespan developmental psychology (Baltes, Lindenberger & Staudinger, 1998; Brandtstädter, 1984, 1998, 2001; Brandtstädter & Lerner, 1999; Freund, 2008; Freund & Baltes, 1998; Heckhausen, 1999; Heckhausen & Schulz, 1995; Heckhausen, Wrosch, & Schulz, 2010; Schulz & Heckhausen, 1996).

The regulation of development is in fact the core concern of lifespan developmental psychology. Particularly in adolescence and adulthood – when cognitive and socioemotional development has reached a certain level, biological maturation processes become less influential, and occupational and family careers open up a wealth of biographical permutations – the question of how individuals choose and adhere to specific occupational and family career paths becomes especially compelling. The force of social constraints and sanctions is

decreasing progressively in the developed world (Heckhausen, 1990; Kohli, 1988), and high levels of social mobility between generations and within the individual lifespan, coupled with diversified lifestyles and biographies, give individuals unparalleled freedom to regulate their own developmental trajectories (Dannefer, 1989; Grob, Krings, & Bangerter, 2001; Heckhausen, 1990, *in press*; Heckhausen & Chang, 2009; Heckhausen & Schulz, 1999b; Held, 1986; Wrosch & Freund, 2001). In modern societies characterized by high levels of social mobility and flexible life choices, individuals play a relatively important role as *producers of their own development* (Brandtstädter & Lerner, 1999; Lerner & Busch-Rossnagel, 1981). Nevertheless, account must still be taken of the constraints due to age-graded structures of both biological maturation and aging (e.g., the “biological clock” and childbearing) and societal institutions (e.g., the age-graded structure of the education system). This age-sequenced structuring of developmental potential provides a framework for developmental regulation (Heckhausen, 1990, 1999, 2007a). Individuals’ movements within this framework, the paths chosen, and the consistency of goal pursuit depend largely on the direction and effectiveness of individual motivation and its implicit and explicit motive components. Apart from age-sequenced structuring, there are restrictions caused by social mobility that tend to exclude members of lower social tiers from pursuing upper-class life courses (overview in Heckhausen, *in press*;

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Heckhausen & Shane, 2015). In the following, we first discuss the lifespan as a field of action within which individuals strive to optimize their development. We then present three conceptual frameworks of developmental regulation. Subsequently, we take a look at several examples of empirical studies that provide insights into developmental goals, self-regulation of motivation, and adaptation to changing life challenges. For this, we will identify adaptive regulation strategies as well as individual differences in developmental regulation and their consequences.

17.1 The Life Course as a Field of Action

Assuming lifelong development to be an active process that individuals influence by means of their actions, the question arises of what opportunities individuals have to act on their own development, and how these opportunities are distributed across the lifespan. To draw on Lewin (1943), the lifespan can be regarded as a field of action. As in Lewin's environmental model, the distance between the individual's current position and desired and undesired states may differ. In the present context, a temporal dimension (age and chronological time) can be added to Lewin's topological one. Developmental milestones such as the transition to higher education acquire incentive character (see the following example) that endows behavior with direction and persistence over time and space (see also the discussion of the concept of incentive in Chap. 5), although this effect becomes weaker with increasing distance from the goal (see the discussion of goal gradients in Chap. 4).

At the beginning of secondary education, for example, students who need good grades to be accepted into college may still be so far from the transition to higher education that the incentive of a college admission does not yet motivate them to do their homework carefully. As graduation approaches, however, the attraction of being admitted to college becomes increasingly powerful.

Another interesting feature of Lewin's field theory in the context of *developmental action theories* is the assumed structure of the psychologi-

cal sphere of action. The individual's current position and the goal region are not necessarily adjacent; rather, the action paths leading to goals may first have to navigate intermediate goals. Lewin (1934) took a "hodological" perspective (from the Greek *hodos*, meaning "path"), assuming that the individual will take the action path providing the shortest connection between the current position and the goal region. Psychological distance depends not only on spatial distance; however, it is also a function of any difficulties and dangers to be overcome (see Chap. 5).

This kind of hodological perspective on the effects of aspired goal states in guiding actions is particularly relevant to research on developmental regulation, the goals of which can rarely be accessed directly. People have to ensure that their action paths stay on track over time, despite delays and detours caused by the constraints and complexities of human life. Strivings that span whole phases of life or even an entire life course require huge regulatory efforts, but once an individual has embarked on a particular developmental and life-course trajectory, these efforts are scaffolded to a considerable degree by societal institutions (e.g., channels of admission to educational institutions and careers).

At the simplest level, the lifespan can be seen as a field of action in which control potential first increases rapidly, reaches a temporary plateau in midlife, and declines again with age, especially advanced age. Figure 16.1 at the beginning of Chap. 16 illustrates the inverse U-shaped trajectory described by primary control potential, beginning with almost complete helplessness and dependence on others in infancy; surging in childhood and adolescence; leveling out at some point in adulthood, depending on the biographical path taken; and declining again in old age under the effects of impaired biological functioning and restricted social roles, finally resulting in death.

Striving for *primary control* is typically maintained throughout these radical age-related changes in primary control potential (Heckhausen, 1997). What changes are its objectives, which can be adapted to the waxing and waning of control potential by setting more or less challenging goals or shifting one's focus to another domain of functioning (e.g., focusing on career goals rather than starting a family or on health rather than career goals). These shifts in the objectives of developmental regulation are determined by individuals themselves or adopted from others against the background of biological processes of maturation and aging, societal and institutional structures, and social and cultural norms.

17.1.1 Biological Changes Across the Life Course

Patterns of biological change across the life course generally follow the inverse U-shaped trajectory depicted in Fig. 16.1. In the first half of life, processes of maturation and acquisition dominate, gradually extending the individual potential for control of the material and social environment. Even at this relatively early stage, however, a few domains of functioning are subject to age-related decline. Some can easily be compensated by technical aids (e.g., by wearing sunglasses to respond to the decreased ability to constrict the pupils). Others are not so easily offset. Performance in domains that rely heavily on high-level physical functioning begins to decline long before middle adulthood, leaving only a narrow age window for world-class athletic careers, for example (Schulz & Curnow, 1988; Schulz & Heckhausen, 1996; see Heckhausen, 2005, on the psychological implications of age-related decline in peak performance).

Middle adulthood sees the onset of various sensory and physiological processes of decline that can typically be offset relatively easily by compensatory strategies (e.g., fitness training) or technical aids (e.g., reading glasses). However, first losses of control potential that are difficult or impossible to overcome are also experienced in midlife (e.g., the ticking of the "biological clock" and the deadline

it imposes on childbearing). The control strategies used to deal with these regulatory challenges are discussed in detail as follows.

Finally, in old age, processes of physical decline come to dominate. In very old age (beyond 75 years), in particular, it becomes increasingly difficult to offset this decline using aids or special strategies. These functional losses seem to be the costs of evolutionary selection, which sought to maximize functioning during the early, reproductive stages of life but neglected the post-reproductive phase, meaning that late-onset malfunctions and disease were not eliminated from the gene pool (Rose, 1991; Williams, 1957; see also the overview in Heckhausen & Schulz, 1999b). Toward the end of life, most people struggle with multiple chronic illnesses and the associated functional impairments (Brock, Guralnick, & Brody, 1990; Schneider & Rowe, 1990).

17.1.2 Societal and Institutional Structures

The societal scaffolding of the life course provides an age-graded structure, on the basis of which individuals form *normative expectancies* about life-course events. These may take the form of situation-outcome expectancies (What happens at what age without my active involvement? – e.g., school entry, retirement), action-outcome expectancies (What can I achieve by my active involvement? – e.g., a valued career, a fulfilled family life), or outcome-consequence expectancies (Which options will be opened up/rendered inaccessible if I don't achieve X? – e.g., graduating from school with good grades, forming a stable relationship). Some of these structures are provided by societal institutions (e.g., the education system, promotion guidelines, matrimonial and divorce laws) and the sociostructural differentiation of educational and occupational trajectories (e.g., certain qualifications are required for certain jobs). Others derive from normative conceptions about the life course, important life goals, and their age-dependent deadlines, which are internalized by the individual members of a society.

17.1.3 Institutionalized and Structural Constraints

Age-chronological constraints determining the beginning and end of certain phases of the life course (e.g., school attendance) structure developmental pathways, as do the regulations on educational-, occupation-, and family-related transitions (e.g., the educational qualifications needed to pursue certain occupational careers) that are institutionalized in state legislation and company guidelines (e.g., Mayer, 1986; Mayer & Carroll, 1987; Mayer & Muller, 1986).

These institutionalized constraints provide *age-graded opportunity structures* for certain life-course events. Optimal conditions are provided for those who are “on time”; those who are “off time” have to contend with numerous difficulties (Heckhausen, 1990, 1999).

One example is the provision of university grants, summer jobs, and cheap accommodation for students in their early 20s, but not in middle adulthood. Society makes it far easier for younger adults than for older adults to get a degree.

Once a particular life-course track has been chosen, institutionalized opportunity structures can have a *channeling or canalization effect*. Some educational pathways lead almost automatically to certain occupational careers, for example, and the first major steps in starting a family (e.g., getting married) pave the way for subsequent developments in that domain (e.g., buying a home together, parenthood). Individuals can thus follow age-sequential paths that have been carved out by society (Blossfeld & Mayer, 1988; Hogan, 1981; Marini, 1984; Sørensen, 1986) to reach important life goals (Heckhausen, 1990, 1999) without the need for permanent volitional control and decision making. The regulatory effects of these institutionalized paths through the life course can be compared with those of the canalization phenomena known from developmental biology, in which cells specialize according to genetically controlled programs of development that apply to whole complexes of characteristics, meaning that they are better protected against disorders and malfunctions than if every characteristic had to be developed individually and independently (Alberch, 1980; Gottlieb, 1991;

Oster & Alberch, 1982; Waddington, 1957). In Waddington’s (1957) terminology, the process of development takes place in an “epigenetic landscape,” a system of valleys and ridges that may start close together but diverge considerably over the course of development. People from similar origins may make different decisions at a critical points of transition (e.g., whether to pursue higher education), thus opening up different developmental pathways and resulting in different developmental outcomes later in life.

However, while certain developmental pathways are optimized, the directions life courses can take are often restricted by an individual’s social class. This applies, for example, to the transition from primary to secondary education in Germany. The less education children’s parents have received, the better children need to perform in fourth grade to convince their teachers to recommend them for entering the highest level of secondary schooling (“Gymnasium”; Arnold, Bos, Richert, & Stubbe, 2007). It is thus particularly difficult for working class children to continue their education at a “gymnasium” after primary school. Their normative developmental pathway usually assumes that they transition to the two lower school levels (“Realschule” and “Hauptschule”) and later move on to receive blue-collar vocational training. How such social inequity manifests itself differs across countries. In the United States, this inequity is primarily caused by the large differences with regard to how much funding schools in poor and rich neighborhoods receive, alongside highly selective admissions and extremely high tuition fees at elite universities. It would be interesting to systematically investigate whether each society with social inequity applies some form of institutional and/or sociostructural conditions that safeguard the chances of upper-class children to maintain their social rank and undermine lower-class children’s chances of moving up.

17.1.4 Normative Conceptions About the Life Course

Besides institutionalized and structural constraints, normative societal conceptions about the life course

are coming to play an increasingly important role in regulating lifespan development (Heckhausen, 1990, 1999). The flexibility and “Weltoffenheit” (openness to the world) of human behavior (Gehlen, 1958) has long given sociological anthropologists reason to see the regulatory function of social groups and their norms as anthropological constants of human life (Berger & Luckmann, 1967; Claessens, 1968). Human behavior is not biologically or genetically predetermined and tends not to be externally enforced by society. Rather, individuals regulate their own behavior on the basis of the social norms and conventions they internalize (Elias, 1969) during socialization, which make this regulation seem natural and inevitable (Berger & Luckmann, 1967; Douglas, 1986). The same reasoning seems to apply to the regulation of life course and would help explain why normative life-course patterns and the age timing of life transitions remain valid for most members of modern societies (Hogan, 1981; Marini, 1984; Modell, Fürstenberg & Hershberg, 1976; Modell, Fürstenberg & Strong, 1978; Uhlenberg, 1974), even when societal frameworks are weakened (Dannefer, 1989; Held, 1986; Neugarten, 1979; Rindfuss, Swicegood, & Rosenfeld, 1987). Life-course sociologists have shown that, during crises such as World War II, the Great Depression, and the postwar years in Germany, the age timing of major life transitions (e.g., graduation from school, marriage) remained largely unchanged (Blossfeld, 1987, 1988), as did normative conceptions about the ages at which people should leave school, get married, and reach other major milestones in life (Modell, 1980).

Definition

Age-normative conceptions about the life course are resilient and powerful regulators of developmental processes and life-course decisions, even and indeed especially when external societal and institutional scaffolds are weakened.

Findings from studies on normative conceptions about psychological development across

the lifespan are presented in the next section (Heckhausen, 1990, 1999; Heckhausen & Baltes, 1991; Heckhausen, Dixon & Baltes, 1989;

Study

Normative Developmental Change Across the Life Course

J. Heckhausen and colleagues asked young, middle-aged, and old adults to specify the psychological characteristics (e.g., friendly, forgetful, wise, adventurous) that change over adulthood and to state when this happens and whether it is desirable (Heckhausen, 1990; Heckhausen et al., 1989) or controllable (Heckhausen, 1990; Heckhausen & Baltes, 1991). Figure 17.1 shows the developmental gains (desirable developmental changes) and losses (undesirable developmental changes) identified by the adult respondents throughout adulthood and old age. The diagram clearly shows how the relationship of expected developmental gains to losses shifts over the life course, with gains predominating in early adulthood, but losses gradually increasing in middle and especially old age, and finally coming to dominate in very old age.

Interestingly, another study found the perceived controllability and desirability of developmental changes to be closely related (Fig. 17.2), with fewer desirable and fewer controllable psychological changes being expected as people get older (Heckhausen & Baltes, 1991). Relative to young adults, moreover, older people are more likely to see undesirable developmental changes as less controllable than desirable ones. Findings on the effects of development-related control beliefs on subjective well-being indicate that feelings of personal responsibility for undesirable change or regrettable decisions and life events can diminish older adults' well-being (Lang & Heckhausen, 2001; Wrosch & Heckhausen, 2002).

Heckhausen & Krüger, 1993; Hundertmark & Heckhausen, 1994; Krüger & Heckhausen, 1993; Krüger, Heckhausen & Hundertmark, 1995).

Studies on the development of the age-normative conceptions of psychological development across the lifespan show that layperson’s conceptions continue to develop from childhood through adolescence and into old age (Heckhausen & Hosenfeld, 1988; Heckhausen et al., 1989; Hosenfeld, 1988). Eleven-year-olds already have relatively detailed conceptions of how people change over adulthood and old age (comprising 40–60 psychological attributes). These concep-

tions become increasingly differentiated in adolescence. Interestingly, contact with older people is just as conducive to the differentiation of the age-normative knowledge system as increasing age. In adulthood and old age, developmental conceptions become increasingly elaborate, multifaceted, and differentiated, with older adults endorsing more attributes as change sensitive than middle-aged adults, who in turn endorse more attributes than younger adults (Heckhausen et al., 1989). Individual differences in the expectations about development and aging also have behavioral consequences. Kornadt, Voss, and Rothermund (2015), for example, showed that positive or negative expectations about becoming older are associated with more or less preparations for old age, respectively.

Age-normative conceptions also serve as a frame of reference for evaluating the life-course position of others. As soon as someone deviates from internalized norms on the family or career status considered appropriate at a certain age, there is internal (and, in the social group, external) pressure for biographical justification. Krüger, Heckhausen, and Hundertmark (1995) found that age-inappropriate family or career status (e.g., not having a steady job by the age of 40) elicited surprise and rather extreme evaluations in their respondents (positive evaluations of advanced development, negative evaluations of delayed development).

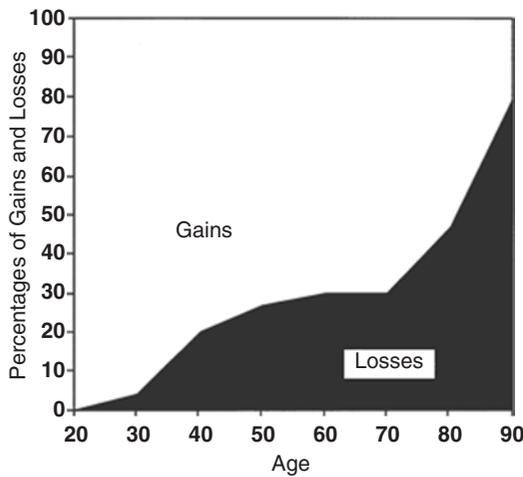
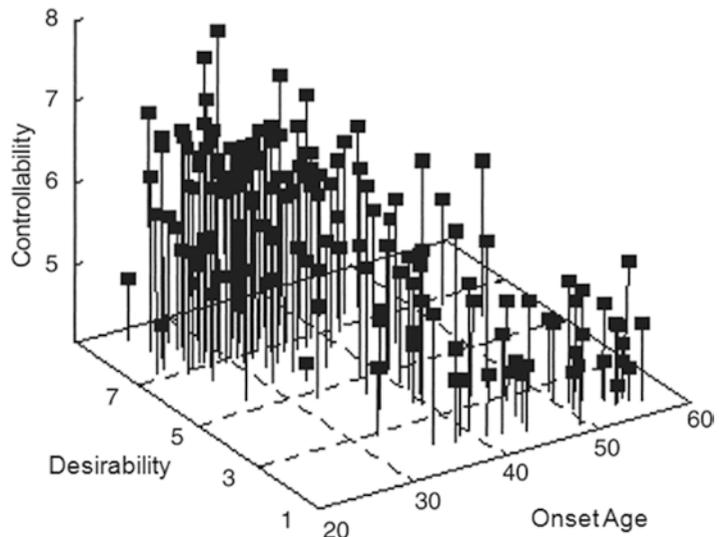


Fig. 17.1 Expectations about developmental gains and losses in adulthood (Based on Heckhausen, Dixon, and Baltes, 1989)

Fig. 17.2 Expectations about the desirability, controllability, and age-related timing of developmental changes in adulthood (Based on Heckhausen and Baltes, 1991)



Age-normative conceptions provide social frames of reference that individuals use to assess when and to what extent they and others are “on time” or “off time” in reaching the major milestones of lifespan development, whether their progress is delayed or accelerated, and whether they need to intervene and make adjustments (see the section on developmental goals later in this chapter) to bring their life back in line with internalized conceptions of a successful life course.

Finally, age-normative conceptions can serve to protect self-esteem by allowing people to see the losses they experience in middle and old age as relatively mild variants of age-related decline (Heckhausen, 1991; Heckhausen & Brim, 1997; Heckhausen & Krüger, 1993). Adults at different ages think that their own developmental prospects in old age are more favorable than for most other people (Heckhausen & Krüger 1993). This discrepancy, which helps buffer self-esteem, was larger for the middle-aged adults than for the young adults and most salient for the old participants. When asked about problems from various areas of life (e.g., money, health, loneliness, marriage, stress, work, and children), people of all ages rate most other people’s problems to be more serious than their own (Heckhausen & Brim, 1997). It was particularly interesting that the perceived severity of one’s own problems in a particular domain of life was associated with the view that the same problem is especially serious for most other people of one’s own age. Participants appear to downgrade the age-normative reference group to protect their own self-esteem. If the area of functioning, in which individuals experience problems, is perceived to be a general trouble spot for people of their age, they need not feel as personally responsible for that problem. This interpretation is supported by Mustafić and Freund’s (2012) finding that adults of different ages tend to be more content with their lives if they perceive the cognitive and social developmental prospects of others in the same age group as unfavorable.

Summary

The human life course provides an *age-graded field of action* for individual developmental regulation. Individuals can adapt their goal-related behavior and control striving to the opportunity structures of the life course. In general, the individual potential for control of the environment undergoes radical changes across the lifespan, increasing steeply in childhood, leveling out in middle adulthood, and declining in old age. Biological processes of maturation and aging are one of the main factors determining this inverse U-shaped trajectory. Furthermore, societal opportunities and constraints in the form of institutional and social structures or age-normative conceptions about the life course scaffold important life-course transitions. Sociostructural canalization effects narrow down individuals’ options along given life-course tracks but help them stay on track for long-term goals. Normative conceptions about psychological development across the lifespan develop early in life and become increasingly differentiated in adolescence and adulthood. They provide a frame of reference for evaluating one’s own development and that of others and can protect the self-esteem of individuals confronted with developmental losses and other stressors in middle and advanced adulthood.

17.2 Motivational and Behavioral Models of Developmental Regulation

17.2.1 Two-Process Model of Intentional Self-Development

Brandtstädter and his colleagues developed a model of intentional self-development that focuses on the important roles of the acting individual and its developmental goals (Brandtstädter, 1986, 1998, 2001). For Brandtstädter, the main function of development-related action and thought is to stabilize the individual’s construction of self across the lifespan and to protect it against age-related challenges. This personal continuity depends on the construction and stabilization of self-repre-

sentations, many facets of which are open to development and thus exposed to dynamic processes of gains and losses across the lifespan. Individuals are motivated to offset any discrepancies arising between self-representations and the associated developmental goals, on the one hand, and the self-states that are actually attained or attainable at a given age, on the other. According to the two-process model, this may be done in two ways:

1. *Assimilation* (persistent goal striving): The individual may engage in self-referential activities aiming to bring personal development in line with himself or herself and life goals (e.g., learning to better play the piano). The discrepancy between actual and desired states is addressed by changing the actual state.
2. *Accommodation* (flexible goal adjustment): The individual may adjust self-referential goals to bring his or her self and life goals in line with the given opportunities and constraints. In this case, the desired state is adjusted. According to Brandtstädter, processes of accommodation are typically things that happen to individuals and are thus not intentional and have no conscious representation.

In the past, there was also a version of this model (known as the AAI model) that involved three processes. In addition to assimilation and accommodation, this version of the model also included processes of immunization (Brandtstädter & Greve, 1994). Immunization of the self-concept is made possible by means of altered evaluation criteria (Greve & Wentura, 2003). If somebody, for example, claims to have a good memory, their criterion for “good memory” might come to include the successful use of mnemonic devices instead of reliance on pure recall.

Assimilative and accommodative processes of intentional self-development serve to maintain personal continuity and identity over time. Both processes can be activated when developmental losses lead to discrepancies from the self-image (e.g., in an older adult whose self-image includes

a good memory for numbers). Assimilation and accommodation are antagonistic, meaning that the activation of one process inhibits that of the other. For example, a woman who signs up for a memory training course because she is having trouble remembering telephone numbers (assimilation) will not, at the same time, lower her expectations with respect to memory capacity (accommodation). The first cross-sectional study by Brandtstädter and Renner (1990) found that with increasing age, adults (between 34 and 63 years) use assimilative processes of persistent goal striving with decreasing frequency, whereas accommodative processes of flexible goal adjustment are increasingly utilized.

Within the two-process model, assimilation and accommodation are thought to be activated under different functionally suitable conditions. If goals are very important and irreplaceable to self and behavioral resources are available at the same time (controllability), assimilative processes of persistent goal striving are activated. If a goal, however, is very difficult or even impossible to achieve or if the goal is relatively irrelevant to the self, accommodative processes of goal adjustment come into play (Brandtstädter & Rothermund, 2002).

In their extensive research program, Brandtstädter and colleagues have demonstrated the functioning of these assimilative and accommodative self-regulatory processes and their adaptive effects on self-esteem and psychological well-being in various contexts (Brandtstädter, 1998, 2001; Brandtstädter & Greve, 1994; Brandtstädter & Rothermund, 2002; Brandtstädter, Wentura & Rothermund, 1999; Greve & Wentura, 2003; Rothermund & Brandtstädter, 2003a, 2003b). Many of the studies by this group are based on longitudinal research with middle-aged to older (58–77 years) adults who were asked over 4 years about their persistent goal striving (i.e., assimilation), flexible goal adjustment, life goals (i.e., general values), functional status in different areas of life, efforts to change, and subjective well-being. Rothermund and Brandtstädter (2003a, 2003b), for example, reported that efforts to compensate for functional loss due to aging increased until age 70 and then declined at the

same rate as subjective controllability. Overall, participants remained relatively content with their own functional status because they adjusted the framework of their assessment (i.e., compared to the past) and perceived their functional status as less important if they did not see a chance to improve it.

In summary, the research group around Jochen Brandtstädter was able to show that indicators of life satisfaction and mental health stay relatively stable across the lifespan. As people grow older and thus experience functional loss, assimilation loses its importance, and accommodation processes become more common. This change apparently protects aging individuals from the negative affective consequences of aging. At the end of life and when faced with our own mortality, flexible goal adjustment and ego-transcending goals become more important than extrinsic and egocentric, instrumental goals (Brandtstädter, Rothermund, Kranz, & Kühn, 2010).

17.2.2 Motivational Theory of Life-Span Development (MTD)

Within the framework of the Motivational Theory of Life-Span Development (MTD), the efforts individuals make to regulate their development are seen as attempts to gain as much control as possible over one's own development and life course (Heckhausen, 1999; Heckhausen et al., 2010; Heckhausen & Schulz, 1995; Schulz & Heckhausen, 1996). Motivated behavior pertaining to development thus follows the *primacy of primary control striving*. Primary control means that an individual can cause effects in his or her environment. Therefore, the leading principle is not consistency of self (as is the case in the two-process model) or well-being after achieving pleasant states or avoiding unpleasant states (as is the case in the SOC model; see the next section) but rather the maximization of primary control in influencing one's own development and living conditions. Successful development maximizes our primary control over our own life course with regard to the various domains of life

and throughout the lifespan. This success depends not only on primary control striving but also on *secondary control strategies* because they help regulate our motivation when pursuing goals or allow us to reconsider and disengage from these goals if we need to reappraise our situation.

The MTD conceptualization of our control striving is realized when we choose, pursue, achieve, or abandon medium-range and long-range developmental goals. The question which developmental goals should be chosen or dropped in order to optimize control (optimization) should be guided by the controllability of goal realization (*congruence principle* of goal selection). Controllability varies of course with age and other situational factors (sex, social class, societal conditions). Important developmental goals (such as graduating from college, entering the job market, starting a family) can be achieved much more easily during particular parts of our lives. Thus, realizing them during those optimal age windows requires less effort, which leaves the individual with the capacity to pursue other important goals.

Individuals take part in the design of their own development by means of motivated behavior as well as the selection, pursuit, and potentially abandonment of goals. All of this happens in cycles of sequentially organized behavioral phases. Figure 17.3 illustrates the typical course of a behavioral cycle according to the action-phase model of developmental regulation, which constitutes the core of the Motivational Theory of Life-Span Development: When individuals select optimizing goals, suitable developmental goals are chosen based on certain heuristics. These heuristics include the *congruence* of goal selection with control and behavioral opportunities, the consideration of potential *consequences* for other areas of life or long-term development, and the *avoidance of developmental dead ends* that would trap the individual on an undesirable life course.

Once an individual decides on a specific developmental goal and thus crosses the Rubicon to enter the phase of volitional behavior (see Fig. 17.3), a volitional mindset that focuses on realization sets in. This process of switching

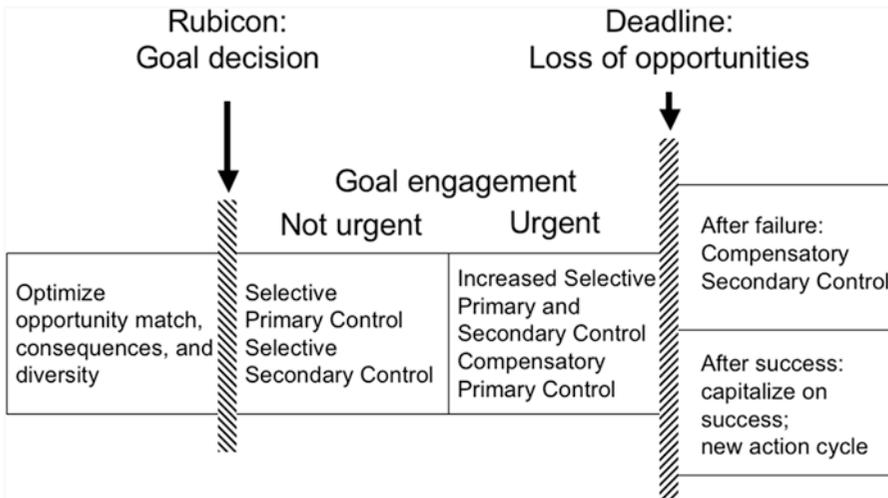


Fig. 17.3 Action-phase model of developmental regulation (Based on Heckhausen, 1999)

between motivational (deliberative) and volitional (implemental) mindset can be found for short-term actions as well as longer-term developmental goals (see Chap. 12). This mindset helps strengthen the efforts made in order to realize the goal and protect them from the potentially weakening effects of encountered obstacles or competing goals. Such volitional protection is particularly important in the case of long-term goals because we need to pursue them in spite of daily distractions and other goals pursued at the same time.

Two control strategies characterize *goal engagement*: *Selective primary control strategies* involve the investment of behavioral resources (time, effort, skills) in goal pursuit, whereas *selective secondary control strategies* use volitional self-regulation to enhance motivational commitment to selected goals by means of meta-volitional approaches (e.g., imagining the realization of the goal, avoiding distraction, increased perceived control). If failure seems to be imminent or if behavioral opportunities are disappearing (see phase of urgent pursuit prior to developmental deadlines), selective primary and secondary control strategies are intensified and frequently accompanied by a third type of control strategies: *compensatory primary control strategies*. These involve asking for help or advice or making use of uncommon compensatory methods (e.g., reading lips in case of hear-

ing loss, using a wheelchair in case of reduced mobility).

If an individual arrives at a *developmental deadline* for a specific goal, she or he loses control opportunities for attaining that goal to an extent that makes it pointless to still pursue that specific goal because the slim chances of success do no longer justify the effort required for realization. If the developmental goal was achieved before the deadline, the life course can continue with related follow-up goals (e.g., positively affecting the development of one's child once it is born; see also "Studies on Childbearing as a Developmental Goal"). If the goal was not achieved (e.g., not having children by a certain age), however, the continuation of an adaptive development can only be ensured if an individual uses compensatory secondary control strategies to motivationally distance her- or himself from the previously preferred goal and change its behavior accordingly (see also Wrosch, Scheier, Miller, Schulz, & Carver, 2003). Compensatory secondary control strategies also include strategies of self-protection that enable individuals to overcome the setback of failed goal realization. This process is necessary to allow for new goal engagement without losing one's motivational and behavioral capacity.

Heckhausen et al. (2010) summarized the existing results on the central assumptions of the Motivational Theory of Life-Span Development in a comprehensive review article. Empirical research

has provided much evidence supporting its core claims about the primacy and adaptiveness of primary control striving, about the match between control strategies and behavioral opportunities over the lifespan, and about the structuring and sequential organization of behavior pertaining to developmental regulation. Other theoretical claims such as the organization of process changes between behavioral phases (e.g., between urgent pursuit and goal replacement), on the other hand, have not yet received much empirical attention.

17.2.3 Model of Selection, Optimization, and Compensation (SOC)

The model of selection, optimization, and compensation (SOC model) was introduced by Baltes and Baltes (1989, 1990) as a general meta-theoretical frame of reference for the interpretation of individual behavior and the experience of developmental gains and losses throughout the lifespan. *Selection* refers to the choice of and preference for certain functional areas; *optimization* refers to the investment of resources into these areas; and *compensation* refers to the attempt to make up for developmental losses. The original model places all three core processes at the same level and conceptualizes them as adaptive regardless of the circumstances.

Freund and colleagues founded a behavioral theoretical perspective of the SOC model that is centered around the roles that the availability of resources and the remaining lifetime for pursuing goals play for maximizing developmental gains (elective selection) and minimizing developmental losses (loss-based selection) (Freund, 2008; Freund & Baltes, 2000, 2002; Knecht & Freund, 2016; Riediger, Freund, & Baltes, 2005; Wiese, Freund, & Baltes, 2002). This perspective is based on the assumption that goal selection, optimization of gains, and avoidance of and compensation for loss are activated depending on an individual's resources and remaining developmental opportunities (future time perspective). If sufficient resources are available, gain-oriented goals tend to be preferred; if resources become scarce, avoiding losses becomes central.

By making SOC processes dependent on the availability of resources, Freund and colleagues introduced a criterion for the adaptiveness of developmental regulation processes to the SOC model that is reminiscent of the opportunities of and restrictions on control found in the Motivational Theory of Life-Span Development (Heckhausen & Schulz, 1995; Heckhausen et al., 2010). Regarding this important issue, the two models of developmental regulation converge. Both postulate that processes of developmental regulation – such as selectivity with regard to goals, goal engagement, and compensatory strategies – are not always adaptive. Instead, their adaptiveness (or lack thereof) depends on contextual factors of available behavioral options and developmental potentials.

Empirical studies that apply the resource-oriented SOC approach look at age-related trends in goals related to gains and losses and on the pursuit of multiple simultaneous goals and their conflicting or synergetic dynamics (see related discussions in Sect. 17.3.1 and 17.3.5). In addition, particularly studies in the field of work psychology have found a positive relationship between the use of selection, optimization, and compensation and work performance as well as subjective well-being, primarily among older employees (Abraham & Hansson, 1995; Baltes, & Heydens-Gahir, 2003; Baltes & Rudolph, 2012).

17.3 Developmental Goals as the Organizational Units of Developmental Regulation

Long-term or developmental goals play a crucial role in all important research programs on developmental regulation. Individuals' active attempts to regulate their own development can be conceived of as motivated action. Developmental regulation is directed at goals relating to one's future development and important life-course transitions (Brandtstädter, 2001; Brunstein, Schultheiss, & Maier, 1999; Freund, 2003; Heckhausen, 1999). Within the Motivational Theory of Life-Span Development, these developmental goals organize action into distinct phases – from the selection of a

developmental goal to a phase of active goal pursuit, followed by goal deactivation and finally evaluation of the action outcome – that constitute a development-related cycle of action (see below; Heckhausen, 1999, 2007b; Heckhausen & Farruggia, 2003).

The concept of developmental goals has had various precursors over the history of motivational research. The goal concepts assumed in these models have been located at different levels of abstraction, differed in their assumed conscious accessibility and universality vs. individuality, and spanned different periods of the life course. One of the first models was proposed by Charlotte Bühler (1933; Bühler & Marschak, 1969), who postulated four basic life tendencies, each comprising a number of specific life goals: need satisfaction (life goals: need satisfaction, love and family, sexuality, self-satisfaction), adaptive self-limitation (life goals: self-limitation, caution, adaptability and submission, difficulty avoidance), creative expansion (life goals: self-development, power, fame), and establishment of inner order (life goals: moral values, political and/or religious devotion, success). The basic tendencies and goal categories are conceptualized as universal, but their strengths are expected to vary interindividually.

Like implicit motives, Bühler's basic tendencies and life goals are only partly conscious. Unlike implicit motives (McClelland, 1985), however, Bühler's life goals are age specific to the extent that need satisfaction and adaptive self-limitation predominate in childhood, creative expansion and establishment of inner order become salient in adolescence and adulthood, and old age sees either the continuation of the tendencies dominant in adulthood or a regression to need satisfaction.

Havighurst (1953) drew on normative developmental milestones, rather than individual differences, to formulate his concept of *developmental tasks*. In taking this approach, he sought to reflect the complex interplay between the individual's striving for growth, on the one

hand, and the demands, opportunities, and constraints of the social environment, on the other.

Definition

Developmental tasks are age-normative challenges to individual development that derive from processes of biological maturation, cultural traditions, and individual desires, aspirations, and values.

For Havighurst, successful mastery of developmental tasks is conducive to further growth and success in subsequent developmental tasks, whereas failure in a developmental task has negative implications for future development.

Other goal concepts are less specific to development but related to individuals and their motivation more generally; they are on a similar level of abstraction as implicit motives but are more accessible to conscious introspection. They include "current concerns" (Klinger, 1975, 1977), "life themes" (Cskiszentmihalyi & Beattie, 1979), "personal strivings" (Emmons, 1986, 2003), "identity goals" (Gollwitzer, 1987; Gollwitzer & Kirchhof, 1998; Gollwitzer & Wicklund, 1985), and "terminal values" (Rokeach, 1973). These longer-term goal orientations and personal concerns motivate people to keep generating new and specific objectives that concretize their general goal orientations and set a timeframe for action. Short- or midterm, specific personal goals capable of regulating behavior directly have been investigated in research programs on "personal projects" (Little, 1983, 1999), "personal goals" (Brunstein, 1993, 1999; Brunstein et al., 1999; Riediger et al., 2005; Wadsworth & Ford, 1983), "life goals" (Nurmi, 1992; Nurmi & Salmela-Aro, 2002; Nurmi, Salmela-Aro, & Koivisto, 2002), and "personal life tasks" (Cantor & Fleeson, 1991; Cantor, Norem, Niedenthal, & Brower, 1987).

Crucially, specific mid-range personal goals endow an individual's everyday behavior with direction, coherence, and meaning. Their presence alone may enhance psychological well-being (Brunstein et al., 1999; Brunstein, Dargel, Glaser, Schmitt, & Sporer, 2008). Furthermore, congru-

ence between explicit personal goals and implicit motives is central to the efficiency of action and to psychological well-being (see comprehensive overview in Chap. 9).

In a series of studies on the congruence between explicit personal goals and implicit motives in the domains of achievement and power (“agency”) versus affiliation and intimacy (“communion”), Brunstein and colleagues found that explicit and implicit motives were not significantly correlated, that the degree of goal attainment on explicit goals influenced emotional well-being only if the goal was congruent with the individual’s implicit motives, and that pursuit of motive-incongruent goals had negative implications for attainment of motive-congruent goals and hence for emotional well-being (Brunstein, 1993; Brunstein, Lautenschlager, Nawroth, Pöhlmann, & Schultheiss, 1995; Brunstein, Schultheiss & Grässmann, 1998; see also Chap. 9 in this volume).

Finally, psychological well-being also depends on whether the goal pursued is perceived to be attainable and controllable (Brunstein, 1993). The pursuit of attainable goals has positive effects on psychological well-being, whereas the pursuit of goals classified as unattainable tends to have adverse effects on subjective well-being and may even be associated with depressive symptoms (Lecci, Karoly, Briggs, & Kuhn, 1994; Röhrle, Hedke, & Leibold, 1994). This pattern of results has been replicated in studies with students (Brunstein, 1993), middle-aged housewives (Brunstein, Ganserer, Maier, & Heckhausen, 1991), and older adults (Brunstein et al., 1999).

17.3.1 Congruence Between Developmental Goals and Developmental Opportunities

To ensure successful and efficient investment of personal and social resources (Freund, 2008), goal striving should be synchronous with the age-graded opportunity structures to attain developmental goals across the life course (Heckhausen, 1999; Heckhausen & Farruggia, 2003; Heckhausen et al., 2010; Schulz & Heckhausen, 1996). In other words, developmental goals should be pursued

when the biological and societal conditions for their realization are favorable. As discussed in Sect. 17.1, age-normative conceptions about development across the lifespan assume developmental gains to decrease over adulthood and developmental losses to increase (Fig. 17.1). An adaptive selection of developmental goals should reflect these age-normative expectations of gains and losses. This proposition has in fact been supported by several studies (e.g., Ebner, Freund, & Baltes, 2006; Heckhausen, 1997; Heckhausen & Tomasik, 2002; Heckhausen, Wrosch & Fleeson, 2001; Hundertmark, 1990; Hundertmark & Heckhausen, 1994; Wrosch & Heckhausen, 1999). Heckhausen (1997) asked young, middle-aged, and older adults about their developmental goals (e.g., “Please list the five most important hopes, plans and goals for the next five to ten years”) and classified them into the categories work, family, health, finances, leisure, and society (e.g., peace). The age differences emerging in the responses reflected the relevance of participants’ age and age-graded controllability. Specifically, goals pertaining to work, finances, and family were mentioned less frequently with progressing age, while health, leisure, and society became much more common concerns. Heckhausen also divided the goals by whether they expressed something that participants desired (gain-oriented goals, e.g., harmonious family life, successful career) or wished to avoid (loss-oriented goals, e.g., unemployment, poor health). The responses of the three age groups revealed opposite trends: Young adults responded with the highest number of gain-striving goals, while older adults listed the fewest gain-striving goals. The reverse was true for loss-avoiding goals, with middle-aged adults operating somewhere between the two extremes in both cases. Similarly, Ebner et al. (2006) found changes in goal focus with age: While young adults tended to focus on developmental gains, older adults focused on the preservation of status and avoidance of developmental losses.

These age trends with regard to gain-striving and loss-avoiding developmental goals reflect normative expectations about developmental gains and losses during adulthood (see also Fig. 17.4). Normative expectations seem to represent guidelines and timelines that help

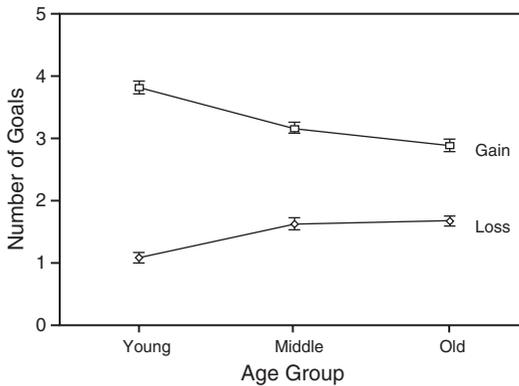


Fig. 17.4 Gain- and loss-oriented developmental goals in young, middle, and late adulthood (Based on Heckhausen, 1997)

individuals with deciding which goals and areas of life they should prioritize at a given time of their lives.

With regard to the general distinction between gain-striving and loss-avoiding goals, most people thus appear to base their personal goal selection on their own expectations about the age-graded opportunity structure. But does the same apply to the fit between specific goals and age-differentiated goal-specific opportunities? This has been a particularly relevant question in the context of the Motivational Theory of Life-Span Development.

Realization of most developmental goals depends on a number of biological, social, and biographical (in the sense of the canalization effect) conditions being in place. Opportunities to realize important developmental goals, such as starting a family or establishing oneself in a career, are thus not distributed at random across the age axis, but vary systematically with age. These waxing and waning curves of opportunity each have ideal timing periods, when opportunities for goal attainment are at a maximum (Heckhausen, 2002a; Heckhausen & Farruggia, 2003). Figure 17.5 shows hypothetical opportunity curves for a selection of major developmental goals (e.g., school graduation, first child) with different gradients of increasing and decreasing opportunities and phases of maximum opportunity of differing lengths. Some opportunity trajectories are steep and have only a short window of opportunity (e.g., graduation from school, first job); others span much longer periods (e.g., first child).

Developmental deadlines Research on age-normative conceptions about psychological change (see the overview in Heckhausen, 1999, and in Sect. 17.1) and findings from life-course sociology (Fallo-Mitchell & Ryff, 1982; Neugarten, Moore & Lowe, 1965; Plath & Ikeda, 1975; Zepelin, Sills & Heath, 1986–1987) have shown that most adults have detailed ideas about when in life certain opportunities are favorable and from which point on goal pursuit no longer seems advisable (Settersten & Hagestad, 1996). The age-graded sequencing of phases of maximum opportunity for major life goals can thus provide a timetable organizing developmental regulation. Age-normative conceptions give individuals a good idea of when it is appropriate to contemplate particular developmental goals and to invest substantially in their attainment and when there is no longer a point in wasting energy on a goal (see example of biological clock for child-bearing). Of course, individuals may decide to deviate from the developmental timetable and pursue goals at unfavorable times (e.g., to study for a degree in middle age). This deviation has its costs, however, because goal pursuit under unfavorable biological or social conditions requires far greater investment of energy and resources, which are then no longer available for other goals (Heckhausen, 1989). Figure 17.6 shows the age-graded opportunity structure for a developmental goal and the investment required as opportunities increase, plateau, and decline.

What is a developmental deadline?

Individuals who have postponed a particular developmental goal, such as childbearing, may miss the ideal “age window” for that goal but still not want to abandon it. As opportunities for goal attainment decrease, they feel an increasing sense of urgency. They may even be able to foresee a point at which opportunities for goal attainment are so slight that any further goal striving will be in vain. This is the developmental deadline.

Fig. 17.5 Age-graded sequencing of opportunity curves for different developmental goals, (Based on Heckhausen, 2002a)

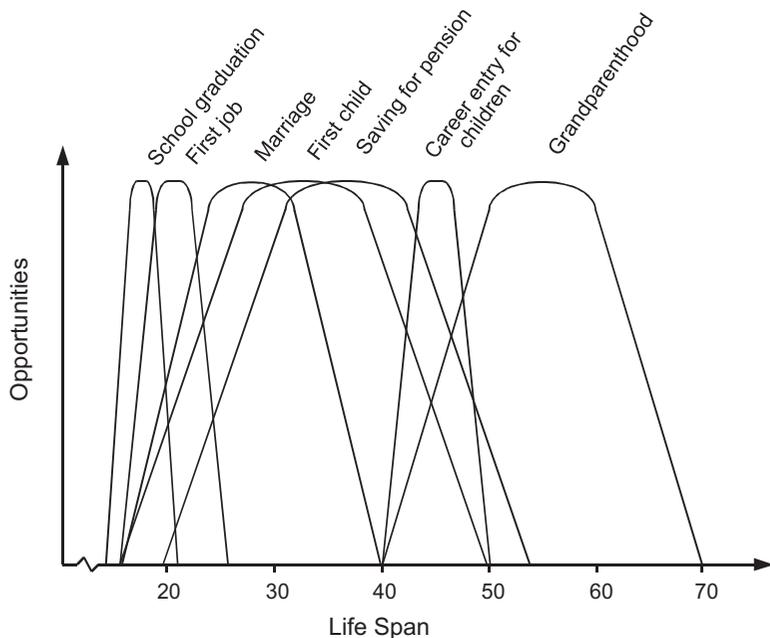
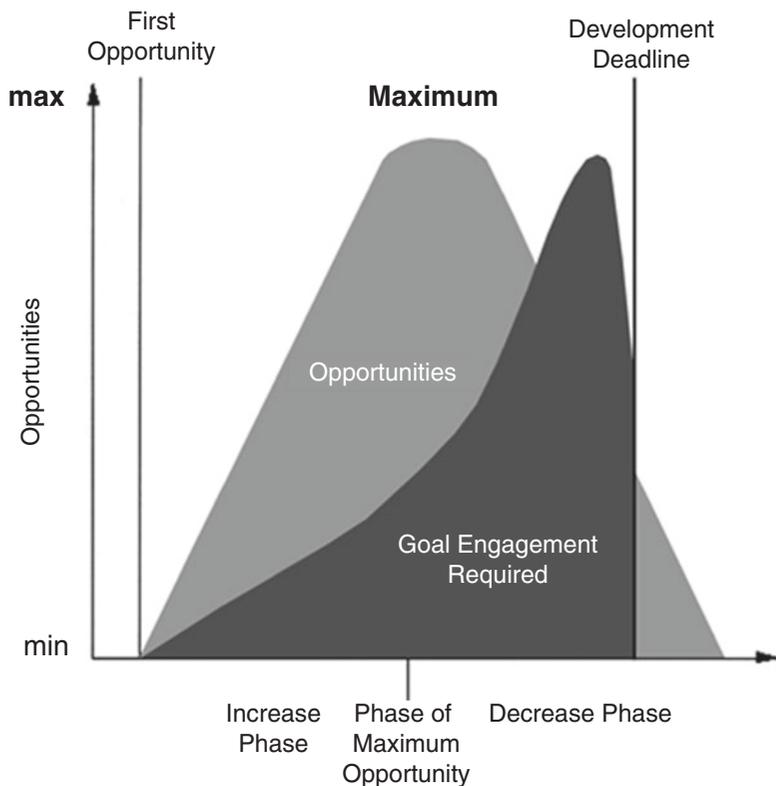


Fig. 17.6 Age-graded opportunity structure and goal striving for developmental goals (Based on Heckhausen, 2000)



Developmental deadlines mark the point at which it no longer makes sense to invest resources in goal pursuit and when the time has come to

disengage from that goal. These timing constraints in goal attainability can be anticipated by the individual and elicit phases of urgent goal striving

immediately before reaching the developmental deadline. This allows individuals to prepare for developmental deadlines with urgent and intensified goal engagement immediately before they are reached. In such instances, individuals sometimes make use of preconceived backup plans that can involve alternative methods of goal striving (Napolitano & Freund, 2016), as illustrated by the steep increase in the goal engagement curve in Fig. 17.6. As soon as the developmental deadline has been passed, however, individuals need to disengage from the now futile goal and invest their energy in other, more fruitful projects.

Developmental deadlines make extraordinary demands of an individual's regulatory capacities; they require a switch from urgent, intensive goal engagement in the immediate run-up to the deadline to goal disengagement and protection of self-esteem as soon as the deadline has been passed. Developmental transitions involving developmental deadlines are thus particularly suitable for testing the potentials and limits of individual developmental regulation.

Summary

To be successful and efficient, goal striving must be synchronous with the age-graded opportunity structures to attain developmental goals across the life course. The rising and falling curves of opportunity for developmental goals such as finding a first job or starting a family have phases of maximum opportunity, during which relevant control striving is most effective. Because these age-graded opportunity curves are represented in age-normative conceptions, they can be anticipated and taken into account in adolescents' and adults' developmental regulation. As adults get older, there is a general shift away from pursuing developmental gains and toward avoiding developmental losses.

Developmental regulation is particularly intensive in the run-up to and immediately after a developmental deadline. As soon as the deadline has been passed, individuals have to switch from a phase of urgent goal engagement to goal disengagement and protection of self-esteem. Three optimization heuristics can be used to regulate

the selection of goals for engagement versus disengagement: age-graded goal selection, consideration of short- and long-term consequences, and maintenance of diversity.

17.3.2 Action Phases in the Pursuit of Developmental Goals: Goal Selection, Goal Engagement, and Goal Disengagement

How can the action cycle of goal engagement and goal disengagement be conceptualized against the background of increasing and decreasing opportunities to attain important goals across the life course? A key proposition of the action-phase model of developmental regulation (Heckhausen, 1999; Heckhausen & Farruggia, 2003) is that the transitions to goal engagement and from goal engagement to goal disengagement are not gradual and progressive, but sudden and discrete, and affect multiple aspects of motivated behavior. The underlying assumption is that the individual can be either in a "go" mode or in a "stop and retreat" mode. The phases of the action cycle and the associated control strategies are presented in Fig. 17.3. The following excursus examines these control strategies in more detail.

The sequence of action phases The action-phase model of developmental regulation (Heckhausen, 1999) expands and modifies the Rubicon model of action phases proposed by Heinz Heckhausen (Heckhausen, 1991; Heckhausen & Gollwitzer, 1987). Specifically, the Rubicon model has been expanded to include the concept of the developmental deadline, the point at which opportunities to achieve a certain goal decline below a critical level. This developmental deadline is hypothesized to be preceded by an *urgency phase* and followed by a phase of goal disengagement. To track the timeline of the model shown in Fig. 17.3 from left to right, an action cycle starts with the predecisional phase before the Rubicon is crossed (see also Chap. 12, Sect. 12.2). During this predecisional phase, the individual evaluates developmental alternatives (e.g.,

different career paths) in terms of their advantages and disadvantages, controllability and feasibility, and costs and utility for other goals (including long-term goals). During this deliberative phase (Chap. 12), information processing should be open-minded and impartial. As soon as the Rubicon has been crossed and a decision made, however, there is a discrete shift to a mindset suitable for maximizing primary control striving toward the chosen goal. Strategies of selective primary and selective secondary control are applied to this end. As the individual approaches the developmental deadline for a chosen goal, primary control striving enters an *urgency phase*, and the application of goal-engagement control strategies is intensified. If internal behavioral resources are insufficient, recourse may be taken to compensatory primary control strategies. As soon as the developmental deadline has been passed, however, goal engagement becomes dysfunctional. The transition from favorable to radically reduced opportunities for goal attainment necessitates a discrete shift from goal engagement to goal disengagement. This change of gear can be illustrated using the analogy of a lion pursuing an antelope. The lion begins the chase at top speed. As soon as it realizes that it is being outrun, however, and that the distance to the antelope is increasing, the lion will stop and turn away abruptly, rather than slowing down gradually.

Excursus

Control Processes Involved in Goal Engagement and Goal Disengagement

The Motivational Theory of Lifespan Development (see also “lifespan theory of control”) distinguishes two kinds of control striving: primary and secondary control striving. Primary control striving is directed at the external world and serves to produce direct effects of behavior in the environment. Examples include building a Lego house, studying for an exam, applying for a job, or trying to sell someone a house. Secondary control striving, in contrast, is

directed at the internal world and serves to influence one’s motivational resources, either by increasing volitional commitment to a chosen goal or by shielding self-esteem and other motivational resources against potential threats. Examples of secondary control strategies directed at volition include imagining the benefits of goal attainment, avoiding tempting distractions, or convincing oneself that the prospects of success on an ongoing project are good. Primary and secondary control strivings work hand in hand throughout the goal-engagement phase to ensure that both behavioral and motivational resources are mobilized.

Goal engagement involves three kinds of control strategies:

1. Selective primary control strategies involve the investment of behavioral resources (time, effort, skills) in goal pursuit (e.g., “I’m going to work hard to succeed in my career.”).
2. Selective secondary control strategies use volitional self-regulation to enhance motivational commitment to selected goals (e.g., “I often imagine how happy I’ll be when I’ve found a good job.”).
3. Compensatory primary control strategies include seeking other people’s help or advice when one’s own primary control resources are insufficient and external assistance is required (e.g., “If I run into problems with my career plans, I’ll ask others for advice.”) or taking detours or unusual approaches (e.g., “I’d accept a less attractive job if it meant I’d get the position I want in the long run.”).

Goal Disengagement and Protection of Motivational Resources

If circumstances make goal attainment prohibitively difficult or impossible, goal disengagement is an adaptive response that prevents behavioral and motivational resources that could be more productively

(continued)

applied to other goals from going to waste. According to the Motivational Theory of Life Course Development, goal disengagement relies on strategies of compensatory secondary control that serve either of two key functions:

1. Goal disengagement: Disengagement from unattainable (or prohibitively difficult) goals allows resources to be invested in other, more feasible goals. Goal disengagement may involve devaluation of the original goal (e.g., “If I don’t succeed in my job, I’ll know that it wasn’t the right thing for me anyway.”).
2. Protection of motivational resources: Strategies serving to protect motivational resources help shield individual self-esteem and action-related optimism against the negative effects of experiences of failure or loss. Self-protective strategies include attribution to external rather than internal factors (e.g., “If there are problems at school, I tell myself it’s not all my fault.”) and strategic social comparison (e.g., “If I don’t succeed in my job, I’ll keep in mind that other people are even worse off.”).

Active goal disengagement (see also Wrosch, Scheier, Miller, Schulz, & Carver, 2003) facilitates a rapid and radical shift from goal engagement to goal distancing. Strategies of active goal disengagement are thus an important component of compensatory secondary control, preventing behavioral and motivational resources from being invested in vain. Moreover, self-protective secondary control strategies help the individual deflect the long-term negative effects that missing a developmental deadline may have on motivational resources (e.g., self-esteem, hope for success in the future). Individuals who succeed in attaining a goal before the deadline expires can either build on their success in that domain (e.g., work toward their next promotion, have another baby) or apply their control strategies to a domain that may have been neglected while pursuing the

more urgent goal. One example is the shift from a focus on career goals to family goals as soon as a major age-dependent move up the career ladder has been made (e.g., tenure in an academic career). Wiese (2000; see also Wiese & Freund, 2000) reported that this kind of “career first, then family” pattern of goal engagement is endorsed by a substantial subgroup of respondents in early adulthood (ca. 25%).

Empirical Studies on Goal Engagement and Disengagement Before and After Developmental Deadlines

Our ongoing research program explores the regulatory strategies that people of different ages and in different sociocultural contexts adopt when confronted with developmental challenges during important life-course transitions. The general research paradigm is to use marked life-course changes in opportunities to attain particular life goals (e.g., having children, climbing the career ladder) as testing grounds for individuals’ regulatory capacity. Specifically, we explore how individuals with different (cultural, sociostructural, individual personality) backgrounds respond to such changes

Study

Childbearing as a Developmental Goal

Both studies compared childless women before (age, 30–35 years) and after (age, 40–45 years and 50–55 years) the developmental deadline for childbearing, which most people consider to fall around the age of 40 (Heckhausen et al., 2001). To this end, the Optimization in Primary and Secondary Control (OPS) scales (Heckhausen, Schulz, & Wrosch, 1998) were adapted to the life goal of childbearing.

Sample items from the control strategy questionnaire were as follows:

- Selective primary control: “I will do whatever I can to have children of my own.”
- Selective secondary control: “I will not let anything distract me from my goal of

having children.”

- Compensatory primary control: “If I have problems conceiving, I will seek assistance (e.g., from a doctor).”
- Goal disengagement component of compensatory secondary control: “If I can’t have children, I’ll have to forget the whole idea.”
- Self-protective component of compensatory secondary control: “It’s not my fault if I don’t have children.”

Findings show that the childless women in the urgency condition (women in their early 30s) felt strongly committed to the developmental goal of childbearing. They reported using all three control strategies of goal engagement – selective primary control, selective secondary control, and compensatory primary control – more frequently than the older women (see the excursus on “Control Processes Involved in Goal Engagement and Goal Disengagement”). Conversely, the 40- and 50-year-old women reported using compensatory secondary control strategies more frequently than the pre-deadline women. Thus, both premenopausal women approaching the developmental deadline and women in the age group of rapidly decreasing fertility showed a pattern of goal engagement or disengagement that was congruent with their age-graded opportunities for childbearing.

We then examined how phase congruence (i.e., congruence of goal engagement and opportunities for goal attainment) relates to psychological well-being measured in terms of the absence of depressive symptoms to determine whether congruence is associated with more adaptive developmental outcomes. The findings presented in Fig. 17.7 indicate that strong selective primary control striving in pre-deadline women was associated with particularly low scores on the depression scale. The reverse holds for post-deadline women (in their 40s and

50s). The more committed these post-deadline women felt to childbearing, the more depressive symptoms they reported. Mental health thus reflects the congruence between control opportunities and control striving; greater congruence is associated with fewer reported depressive symptoms and low congruence with elevated levels of depressive symptomatology.

In another study on developmental deadlines for childbearing, we investigated whether goal engagement or disengagement leads to change at the information-processing level and thus has implicit or subintentional effects beyond conscious control strategies. An incidental memory test was used to assess implicit bias in information processing in terms of recall of goal-relevant and goal-irrelevant information. Respondents were again childless women before and after the developmental deadline. They were first asked to name five developmental goals for the next 5–10 years (Developmental Goals Questionnaire based on Heckhausen, 1997) and then to rate their agreement with sentences about children and babies and sentences about other topics. After the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) had been administered, participants were finally instructed to recall as many as possible of the sentences presented in the rating task. Participants had not been expecting this memory test. The results replicated the findings of the first study on childbearing, to the extent that the developmental goals nominated reflected the age-graded opportunity structures for childbearing. Pre-deadline women reported more developmental goals relating to children than did post-deadline women. Moreover, for the post-deadline women, negative affect was found to be strongly associated with remembering relatively many sentences relating to the positive aspects of life with children, the personal responsibility for not having children, and the implications of childlessness

(continued)

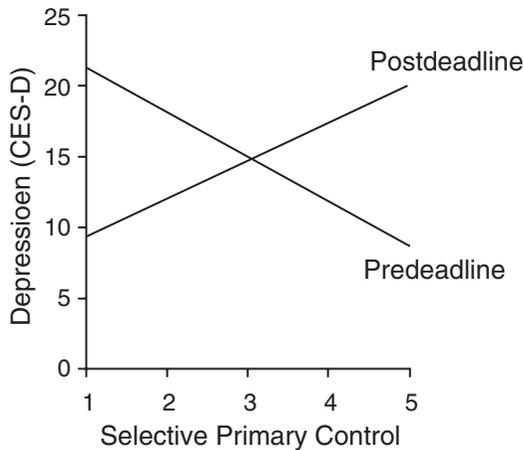


Fig. 17.7 Selective primary control as a predictor of depressive symptoms in childless women before and after the developmental deadline (Based on Heckhausen et al., 2001)

for other goals (becoming a grandparent) in the incidental memory test.

This study thus provided evidence at both the explicit intentional level (developmental goals nominated) and the implicit subintentional level (selective memory) to confirm that goal engagement and goal disengagement follow age-graded opportunity structures. Moreover, the findings showed that incongruence of implicit goal orientations and opportunities for goal attainment is associated with negative affect.

in opportunities with congruent or incongruent goal engagement or goal disengagement.

The two studies described as follows investigated the transition from favorable to fading opportunities for the developmental goal of childbearing. Both of the studies were cross-sectional; changes in the opportunity structure itself (in this case, age-graded female fertility) are too gradual for a longitudinal approach to be feasible.

Another study on developmental regulation before and after a developmental deadline inves-

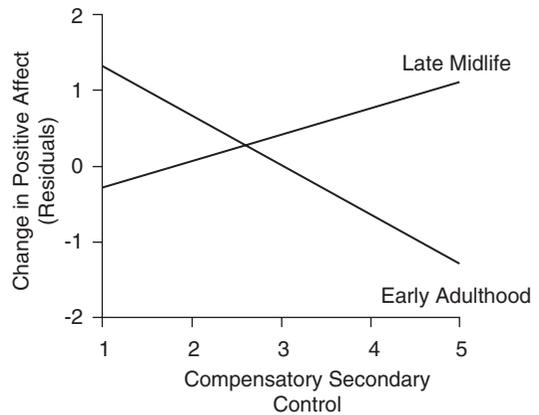


Fig. 17.8 Compensatory secondary control as a predictor of change in positive affect over 18 months in recently separated individuals in early adulthood and late midlife (Based on Wrosch & Heckhausen, 1999)

tigated intimate relationship goals (Wrosch & Heckhausen, 1999). Partnership formation is, in principle, possible at any time in adulthood, so it might seem surprising that there should be a deadline for this developmental goal. The probability of finding a new partner after a separation is known to decrease rapidly over adulthood, however, from around 80% in early adulthood to 20% in late middle adulthood (Braun & Proebsting, 1986; Teachman & Heckert, 1985). Individuals have to come to terms with this sharp decline in opportunities to find a partner, presumably by distancing themselves from the goal at some point between early and late middle adulthood. In his dissertation study, Carsten Wrosch examined men and women aged 20–35 years and 50–60 years who had recently separated from a long-term partner or entered a new relationship. It was assumed that the goal of finding a partner would be urgent in early adulthood, especially after a separation, but that adults in their 50s would find it difficult to form a new relationship and that goal disengagement would be the more advisable course of action for this group. In line with the action-phase model, the young respondents reported more goals relating to intimate relationships and more frequent use of the associated goal-engagement strategies

(selective primary and selective secondary control, compensatory primary control), whereas participants between 50 and 60 years of age nominated relatively few partnership goals and reported more frequent use of compensatory secondary control strategies of goal disengagement and self-protection.

Again, an incidental memory task was used to examine a potential information-processing bias. It emerged that the young adults were better able to recall adjectives describing the positive aspects of intimate relationships (e.g., happy, supportive), whereas the 50- to 60-year-olds remembered adjectives associated with the more negative aspects (e.g., unfaithful, stressful). The respondents in the relationship study were contacted again 18 months after the first wave of data collection and asked to report on their psychological well-being. As shown in Fig. 17.8, strong endorsement of compensatory secondary control strategies (e.g., “I can live a fulfilled life without a partner,” “It’s not my fault that I don’t have a partner”) tended to have detrimental effects on the psychological well-being of young, recently separated participants. They experienced a decline in positive affect over time. In the older respondents, by contrast, strong endorsement of compensatory secondary control strategies was associated with enhanced positive affect over time. In other words, abandoning the goal of forming a new relationship after separation is problematic in early adulthood but adaptive in late midlife. Research has not yet examined the nature of the transition from goal commitment to goal disengagement in this particular context. Based on the action-phase model of developmental regulation, we assume that goal engagement does not decrease gradually as the chances of finding a partner fade. Rather, we hypothesize that individuals faced with steadily worsening prospects of finding a mate set themselves a developmental deadline, investing heavily in the goal of finding a partner in the run-up to that deadline and abandoning it once and for all when the deadline has passed (e.g., devaluing or ignoring the positive aspects of a relationship). It remains for future research to determine whether there really is such

a radical shift in priorities at a self-generated developmental deadline.

17.3.3 Adjustment of Developmental Goals at Developmental Transitions

At certain points in life, new opportunities might arise, while others disappear during a relatively short amount of time. Important examples include the first day at school, starting a family, or retirement. In particular, the various developmental pathways and grave consequences for the life course that are associated with the transition to adulthood have been investigated in several studies (e.g., Freund, Weiss, & Wiese, 2013; Heckhausen & Shane, 2015; Heinz, 2009; Salmela-Aro, Kiuru, Nurmi, & Eerola, 2014; Schoon & Lyons-Amos, 2017; Tomasik & Salmela-Aro, 2012). Therefore, this section will take a closer look at the relationship between societal structures and individual agency in the developmental regulation of this transition. The transition to adulthood determines to a large extent whether or not individuals will be able to improve their social standing as it involves crucial determinants for the life course such as the level of educational attainment. Different societies allow for different degrees of leeway as we will see using the examples of Germany, the United Kingdom, and the United States.

The education system of Germany manages the transition from school to vocational training through the dual system (on-the-job training combined with general and vocational education at a vocational school). The major challenge of this transition is to find a qualified apprenticeship position, preferably before leaving school. This is a challenging and critical step because the number and quality of qualified apprenticeship positions that allow for professional advancement by no means match the demand. During their final year at school (typically tenth grade), students not wanting to continue their general education have to find an apprenticeship (Heinz, Krüger, Rettke, Wachtveitl & Witzel, 1985; Heyn, Schnabel & Röder, 1997) that opens up

relatively positive long-term career prospects (Heckhausen & Tomasik, 2002; Tomasik, 2003) given their individual capacities. Navigating between the Scylla and Charybdis of over- and under-aspiration under urgency conditions is thus a considerable challenge to developmental regulatory capacities of 16-year-old school leavers.

We investigated students in their final year at four high schools located in lower and lower middle-class residential areas in the eastern and western part of Berlin, Germany. Data on students' goals, control strategies, and vocational aspirations were collected twice in the ninth grade and five times at 2-month intervals in the tenth grade. Findings showed that the adolescents adjusted their vocational aspirations, measured in terms of social prestige, to their grades (i.e., their educational resources on the labor market). The adolescents even adjusted their ideas of a "dream job" to the apprenticeships they could realistically hope to be offered (Heckhausen & Tomasik, 2002), such that the vision of a dream job did not prevent them from investing in the search for an appropriate position. A closer examination of aspiration adjustments during the urgency phase of the tenth and final school grade revealed that a pattern that starts with high aspirations, gradually adjusts downward as unsuccessful attempts accumulate and then gradually raises again, is most adaptive (Tomasik, Hardy, Haase, & Heckhausen, 2009). In this process, cognitions of worry about failing to attain an apprenticeship seem to function as adaptive motivational incentives for those who have them, leaving those without such worries behind (Nagy, Köller & Heckhausen, 2005).

Moreover, combinations of strong primary control striving and volitional strategies for enhancing goal commitment (i.e., selective secondary control) proved to be particularly effective under conditions of urgency, especially for girls (Haase, Heckhausen, & Köller, 2008). Intensive primary control striving was a prerequisite for successfully finding an apprenticeship, especially for students who had not yet found one during the last 3 months of tenth grade. Primary control striving was particularly beneficial if primary and secondary control strivings were

combined under conditions of extreme urgency, especially for girls. In this case the investment of behavioral resources (primary control striving) was assisted by meta-volitional strategies of commitment to the goal of finding an apprenticeship (e.g., not being distracted or discouraged; believing in eventual success), which in turn caused a higher resilience to failure and perhaps also a more compelling performance during job interviews with potential employers. Interestingly, this combined effect of selective primary and secondary control striving was particularly pronounced at the end of tenth grade under conditions of great urgency.

In the United States, the transition to employment or college after graduating from high school is much less regulated, which is why many young people end up "floundering" (Hamilton, 1990) and are at risk for downward social mobility (for details on international variation in the school-to-work transition, see Heckhausen, 2002b; Heinz, 1999; Paul, 2001). In this situation many young people tend to have vague long-term expectations of radical upward social mobility that depends primarily on personal effort, showing a meritocratic world view (Shane & Heckhausen, 2016a). Therefore, they often set extremely ambitious and frequently unrealistic goals (Villarreal, Heckhausen, Lessard, Greenberger, & Chen, 2015). Interestingly, such goals help them with persevering over time and even increase their chances of actually realizing these goals (Heckhausen & Chang, 2009). On the other hand, many young people at the transition to job and college are forced to downwardly adjust their personal expectations about how effective their own efforts will turn out to be in the context of various external conditions (e.g., job market, social background, and corresponding resources and relationships). At the same time, these young people tend to maintain the general societal ideology of the meritocratic American Dream (Shane & Heckhausen, 2016b).

The transition to adulthood in the United Kingdom appears to diverge into six distinct pathways (Schoon & Lyons-Amos, 2017; Schoon & NgKnight, in press). These pathways differ from one another based on educational and pro-

fessional trajectories and might be influenced by individual effort. In most, if not all, modern societies, there appears to be a subgroup of marginalized individuals whose chance of upward social mobility is very low, regardless of personal effort (Heinz, 2009; Schoon, 2014).

17.3.4 Goal Engagement and Disengagement in the Context of Health Problems

Other studies have investigated goal engagement and disengagement and the associated control processes in the context of health problems in middle adulthood and old age (Wrosch, Heckhausen, & Lachman, 2000; Wrosch, Schulz, & Heckhausen, 2002). Health impairments are normative developmental challenges in older age that put the capacity for developmental regulation to the test.

Deteriorating health as a result of chronic illness and progressive sensory (e.g., loss of vision associated with macular degeneration) or motor (e.g., arthritis) impairment leads to a reduction in control potential and necessitates appropriate control striving strategies. When health problems in old age are reversible and controllable, primary control striving is suitable for overcoming their effects and can even help improve health and extend longevity (Hall, Chipperfield, Heckhausen, & Perry, 2010). In contrast, disengaging from primary control striving under conditions of relatively high control is associated with the development of depressive symptoms, which in turn weaken primary control striving and resiliency to stress over time (Wrosch & Schulz, 2008; Wrosch, Schulz, Miller, Lupien, & Dunne, 2007a; Wrosch et al., 2000, 2002, 2004).

When health outcomes are less controllable, compensatory strategies of secondary control, such as disengaging from unrealistic standards of physical functioning and acknowledging the positive side effects of illness, seem to be most conducive to physical and psychological well-being (Affleck, Tennen, Croog & Levine, 1987; Boerner, 2004; Evers et al., 2001; Rothermund

& Brandtstädter, 2003a, 2003b; Thompson, 1987). Chipperfield, Perry, and Menec (1999) found that primary control striving (e.g., active persistence, effort) in the “young old” (younger than 80 years) and compensatory secondary control striving (e.g., lowering one’s expectations, accepting limitations) in the “old old” (older than 80 years) was associated with higher subjective health ratings. A study on life regrets produced analogous findings. It is more conducive to the psychological well-being of older, but not younger, adults to abandon the goal of making up for past actions and instead to see those actions as having been beyond their control (Wrosch & Heckhausen, 2002).

Heckhausen and colleagues conceptualized in their *lines of defense model* (Heckhausen, Wrosch, & Schulz, 2013) how individuals cope with the increasing health-related problems and functional limitations that occur in particular as symptoms of chronic and progressive diseases in old age (e.g., Parkinson’s disease, osteoarthritis). The model claims that organized goal adjustment is required to optimally adapt to the increasing limitations in health and functionality. Specifically, individuals focus on functional levels and goals that are still achievable and disengage only if they become unrealistic in order to set newly adjusted functional goals. By doing so, people with chronic diseases can gradually back down to realistic lines of defense, rather than continue to pursue rigid and unrealistic functional levels or give up entirely. The reverse is also possible, when individuals regain formerly lost functions in the course of rehabilitation and step-by-step return to their full functional abilities. A study on the rehabilitation of patients who had undergone radical prostate surgery was the first to apply the lines of defense model. During the 7 months of the observation, patients as predicted adjusted their goals of self-reliance and less dependency on using technical aids while managing the problems with incontinence in their daily lives. Patients’ goals became more ambitious as they regained better functionality over time (Knoll, Wiedemann, Schrader, Schultze, & Heckhausen, 2014). The subjective well-being

of patients and their spousal caregivers was higher if both agreed on the lines of defense, i.e., the attempt to independently manage incontinence (Knoll et al., 2015).

Summary

Cross-sectional and longitudinal studies on developmental regulation before and after a developmental deadline have provided evidence in support of two key assumptions of the action-phase model of developmental regulation:

1. A discrete shift from goal engagement to goal disengagement once the developmental deadline has been passed
2. A phase of urgent goal engagement in the immediate run-up to the developmental deadline

Cross-sectional studies on childbearing and intimate relationships have shown that adults surveyed shortly before a developmental deadline are strongly committed to the goal at hand and use corresponding control strategies. Once the developmental deadline has been passed, however, most respondents distance themselves from the goal and use compensatory secondary control strategies to protect the self against the negative consequences of failure experiences. Evidence for congruence between goal engagement/disengagement and opportunities for goal attainment has been found using both explicit measures (goals nominated, control strategies) and implicit indicators of selective information processing. The greater the congruence between goal engagement/disengagement and opportunities for goal attainment, the higher the levels of subjective well-being and mental health recorded (lower levels of depressive symptomatology).

A longitudinal study on the transition from school to vocational training showed that adolescents' capacity for developmental regulation at this precarious transition to adulthood is impressive, with vocational ideals increasingly being adjusted to more realistic aspirations. A combination of selective primary and selective

secondary control strategies proved particularly adaptive at this difficult developmental transition. The study also underlined the importance of the urgency phase in the action cycle and showed that orchestrated application of primary and secondary control strategies is particularly effective during times of urgent goal pursuit.

The action-phase model of developmental regulation has also been specified as a *lines of defense model* and applied to investigate the control striving of patients with acute and chronic illnesses. In line with the findings of studies on developmental goals, the investigations conducted to date have observed positive developmental outcomes when health-related goal engagement and disengagement are congruent with the available control potential, and negative implications for well-being when goal striving vs. goal distancing and control potential are incongruent.

17.3.5 Pursuing Multiple Developmental Goals

The various facets of life require that people function adequately in more than just one domain. Therefore, people usually need to pursue multiple goals at the same time, which is particularly true for long-term developmental goals. Individuals might, for example, simultaneously pursue goals in the domains of family and work and must therefore find ways to coordinate their time and the resources they invest. Based on the general goal system theory (Kruglanski, Chernikova, Babush, Dugas, & Schumpe, 2015; Kruglanski et al., 2002), it should be most adaptive for individuals if their goals do not conflict, but complement one another (see also Chap. 11, Sect. 11.3).

Alexandra Freund's research group has conducted several studies on the pursuit of multiple goals in adulthood. Riediger and Freund (2006), for example, examined the focus on goal investment for important and coherent goals that benefitted one another in a sample of adults between the ages of 20 and 70. A focused selection of goals turned out to be more beneficial to goal

engagement than simply reducing the number of simultaneously pursued goals. The reason for this finding might be that the goals included in a focused goal selection can complement one another. Moreover, the findings suggest that focusing goals becomes increasingly common among middle-aged adults (see also Riediger & Freund, 2004; Riediger et al., 2005). A study by Freund, Knecht, and Wiese (2014) in which middle-aged women and men were asked about their goal investment in various areas of life and about their proneness to psychosomatic diseases yielded convergent results. Women who experienced conflicts between different areas of life suffered from more psychosomatic symptoms than women without such conflicts. Male participants, on the other hand, did not show this pattern. Other research groups have reported similar findings that indicate that engagement in multiple areas of life can have positive implications on domain-specific goal realization and subjective well-being (Shane & Heckhausen, 2016b; Wiese & Salmela-Aro, 2008).

17.4 Individual Differences in the Capacity for Developmental Regulation

Because research on individual differences in the capacity for developmental regulation is still in its infancy, the main objective of this section is to identify directions for future research. Based on the assumptions of the action-phase model of developmental regulation, individual differences in the following dimensions can be expected to determine the adaptability of developmental regulation across the lifespan (see also Heckhausen & Wrosch, 2016):

1. Knowledge of one's control potential and the opportunities to attain developmental goals within the developmental ecology afforded by the existing biological and societal conditions plays a key role in optimized goal selection, as does the ability to obtain this information. The individual macro- and meta-cognitive capacity to analyze relevant opportunities for and limi-

tations to development should become increasingly important as the immediate social environment (e.g., childhood home) fails to provide relevant knowledge and experiences. One example for this are first-generation college students (i.e., students whose parents did not attend university). Conducive parental influence is particularly strong in students whose parents experienced college life themselves (see, e.g., Sy, Fong, Carter, & Boehme, 2011). For students without a similar family background, on the other hand, the relationship with their parents has little impact on their beliefs regarding how to be successful in college but a stronger impact on actual success (Kay, Shane, & Heckhausen, 2016).

2. The individual willingness and ability to adjust processes of developmental regulation to the opportunities and constraints of the developmental ecology determine whether individuals are able to establish congruence between the biological and societal opportunity structures and their own developmental goals. The construct of motivational competence proposed by Rheinberg (2004; Rheinberg and Engeser, 2011; see also Sect. 15.7) is probably decisive in the fine-tuning of environment-action fit. Moreover, the willingness to achieve congruence is probably closely related to the three aspects (three and four) that follow.
3. Strong primary control striving, characterized by persistence and resilience, is the fundamental motivational resource for developmental regulation. A certain degree of a generally optimistic worldview might benefit individuals in pursuing their goals, particularly if they are met with challenges (Heckhausen & Wrosch, 2016; Rasmussen, Wrosch, Scheier, & Carver, 2006). Persistence and resilience may prove excessive, however, if they are not in line with the actual potential for control.

Initial findings on the age-graded adaptability of primary control striving in the context of childbearing (Heckhausen et al., 2001) indicate that individuals who continue to strive for a particular life goal when it is no longer attainable tend to develop depressive symptoms. However, studies on coping with

reversible health problems (Wrosch et al., 2000, 2002, 2004) have shown that it is maladaptive to relinquish primary control striving when control potential is still available. Findings presented by Halisch and Geppert (2000) for a sample of 65- to 85-year-olds show that the persistent pursuit of personal goals only has positive effects on life satisfaction if those goals are judged to be attainable. Intensive investment in goals with low feasibility ratings has pronounced negative implications for life satisfaction. Goal striving must therefore be calibrated to the control potential available in a given situation.

4. The willingness and ability to deactivate and disengage from a goal influences both objective and subjective developmental outcomes. Objectively speaking, individuals who cling to unattainable goals are unable to invest the resources tied up in pursuit of those goals in more feasible projects and thus relinquish control potential. First findings even indicate that deficient disengagement from unattainable goals influences secretion of the stress hormone cortisol over the course of the day and is likely to make these individuals more susceptible to illness (Wrosch, Miller, Scheier, & de Pontet, 2007b).

The subjective costs of deficient goal disengagement are also considerable, as shown in a series of studies by Wrosch et al. (2003). The ability to disengage from unattainable goals has been found to have positive effects on subjective well-being (e.g., perceived stress, depressive symptoms) in young and middle adulthood, especially among individuals who have been exposed to high stress (e.g., having one's child undergo treatment for cancer).

5. Because experiences of failure and loss of control are inevitable across the human life course, strategies of compensatory secondary control that serve to protect motivational resources (e.g., self-esteem, avoidance of self-blame, confidence in the success of future endeavors) are indispensable.

Very little is yet known about interindividual differences in people's preferences for and

skill in applying these different strategies (e.g., self-serving patterns of attribution and social comparison, devaluation of unattained goals). Research into cross-cultural differences in the acceptance of strategies serving to protect motivational resources is also warranted.

6. Another major dimension of the capacity for developmental regulation that varies interindividually is the willingness and ability to reengage in a new goal when an existing goal seems unattainable.

Wrosch et al. (2003) found that goal reengagement varies interindividually and independently of the willingness to disengage from a goal and is associated with enhanced psychological well-being (e.g., perceived stress, meaning in life, depressive symptoms). Interindividual differences in the willingness to both disengage from old goals and reengage in new ones show age-differential effects. In young adulthood, those who find it difficult to abandon unattainable goals benefit most from the willingness to pursue new goals. In later adulthood, in contrast, those who are easily able to relinquish unattainable goals have most to gain from high willingness for goal reengagement. The crucial point is evidently that deficient goal disengagement should not stop people from engaging in new and worthwhile goals in early adulthood, when a multitude of opportunities are available to them. In advanced age, in contrast, it is important to be engaged in goal striving at all, even if the goals are unattainable.

7. Finally, the orchestration of primary and secondary control strategies at transitions between action phases – specifically, from goal deliberation to goal engagement (crossing the decisional Rubicon), from goal engagement to the urgency phase before a developmental deadline, and from urgent goal engagement to goal disengagement (crossing the developmental deadline) – is another key determinant of the capacity for developmental regulation.

In this context, the conceptualization of processes of action control and self-regulation

proposed by Kuhl in his model of action vs. state orientation and its elaboration in the PSI model (Kuhl, 2000, 2001; see also Chap. 13) provides a promising framework that can guide future research. People with a stronger action orientation should express this orientation particularly during the phase of goal striving. Their general ability to switch between motivational and volitional phases should also be superior (Heckhausen & Wrosch, 2016).

Summary

The exploration of interindividual differences in the capacity for developmental regulation is still in its infancy and promises to be a fruitful new field of research. Dimensions warranting study include individuals' knowledge about age-graded change in the opportunities for goal attainment over the life course and the corresponding fit between personal goals and the developmental ecology, the strength and resilience of primary control striving, the willingness and ability to disengage from goals for which controllability is low, access to compensatory secondary control strategies serving to protect motivational resources, the willingness and ability to reengage in new and attainable goals when previous goals become unattainable or prohibitively costly, and finally the orchestration of primary and secondary control strategies at the transition between action phases.

and motivational psychology, it is possible to distinguish three prototypical forms of person/environment transactions that contribute to fit being established over time between the individual and his or her environment, *selective*, *evocative*, and *manipulative* transactions (see also Asendorpf, 2004; Buss, 1987):

- Through their *selection* of environments and situations (e.g., choice of career, choice of partner), individuals can influence the fit of competencies and motivational preferences with the environment and thus play an active role in testing, developing, and optimizing that fit.
- The *evocation* of environments or situations is usually an unintentional result of individuals with certain personality characteristics (e.g., strong approach or avoidance affiliation motivation) repeatedly eliciting similar outcomes or responses (e.g., friendliness, rejection) in the social environment.
- *Manipulation* occurs when an individual shapes the environment directly and intentionally.

In their longitudinal studies with adolescents and young adults, Eccles and colleagues discovered mutual influences between the individual and the self-selected environment (e.g., in the choice of subjects at school; Eccles, 2005; Eccles, Barber, & Jozefowicz, 1999). These authors found that, influenced by the gender role norms prevailing in their peer group, girls may show a dislike for mathematics and physics and consequently make less effort in these subjects, causing their performance outcomes to fall below those of others over time, which in turn leads to reduced confidence in their ability in these subjects (Eccles, 2005; Eccles et al., 1999). These studies thus show that dynamic interactions between the person and the environment do not always lead to optimized developmental outcomes. When conditions are unfavorable (e.g., adverse gender role norms, educational disadvantaging of the family, developmental delay), the developmental dynamics between person and environment can have either

17.5 Motivated Development: Dynamic Interaction Between Development and Motivation Across the Lifespan

The dynamic interactions between individuals and their environment have attracted increasing attention in personality psychology and lifespan developmental psychology in recent years (Asendorpf, 2004; Caspi, 1998; Lang & Heckhausen, 2006; Lerner, 2002; Roberts & Caspi, 2003; Sameroff, 1983; Scarr & McCartney, 1983). From the perspective of developmental

negative or positive implications for development. The decisive point here is whether the influences of biological development and socialization agents in the immediate environment (parents, teachers) suffice to bring development back on track. The further the dysfunctional canalization of the developmental trajectory has progressed, and the weaker the normative regulatory effects of biological and societal structures in the developmental ecology, the more difficult this will be.

Selection and manipulation of the environment play a major role in individual developmental regulation, as outlined in this chapter. In a field of action mapped out by biological and societal structures, selection is by far the most frequent form of transaction between the individual and the life-course ecology. For example, developmental paths are selected at the transition from school to vocational training (Haase et al., 2008; Heckhausen & Tomasik, 2002). Real manipulation of the environment occurs primarily in the context of social relationships with romantic partners, children, parents, friends, colleagues, and neighbors. Not only do individuals decide who to spend more or less time with and who to include in their social networks (Lang, 2001, 2004), but they also play an active role in shaping the quality of their relationships and daily interactions with social partners (Lang & Heckhausen, 2002, 2006; Lang, Reschke, & Neyer, 2006; Rook, Sorkin, & Zettel, 2004). These social relations come to constitute the everyday social environment and thus have a ubiquitous influence on the individual's future development through model learning (for better or worse), conformity, contrast, and contradiction.

The emergence of subgroups with shared value beliefs and normative ideas about the nature of a successful life course, key aspects of which may differ from the conceptions of society as a whole, is an important aspect in the selection and shaping of social networks. If these subgroups become strong enough, they can create their own social developmental ecologies. The student

movement of the late 1960s and early 1970s is one example of this phenomenon. Although these ideological subgroups do not, by any means, create real countersocieties, they can shape the life courses of their members and the perspectives of society in general to such an extent that they instigate social change and ultimately lead to long-term transformation of societal institutions (e.g., marriage and divorce legislation). At political and social turning points, the dynamic transactional efforts of individuals, coupled with the leverage of the collective, can develop enormous – although rare – power that changes the societal conditions of lifespan development lastingly and irreversibly, far beyond the individual's immediate social ecology.

Summary

Individuals' motivated influencing of their own development goes far beyond a mere person/situation interaction. Individuals must navigate their way through the opportunity structures dictated by biological and societal influences and commit to action paths that open up certain opportunities and put others out of reach. In so doing, individuals not only shape their own future but also have an active influence on the developmental ecology and thus on their future scope for action. Although the biological (e.g., genetic makeup, biological maturity, or age) and societal (e.g., social mobility within a society, individual social background) circumstances determine and limit their developmental potential, individuals not only have the freedom to make the best of the given conditions, but they can also seek to actively shape the conditions of their development by means of selection, evocation, and manipulation. These transactions are not always conscious, or indeed to the advantage of the individual, whose choices (e.g., of a career or a partner) shape the social environment, for better or worse. Nevertheless, individuals can and do become agents in shaping the social ecologies for their own development and thus exert powerful influences on their developmental potential and future life course.

Review Questions

1. *Which influences determine the opportunities and constraints that the lifespan offers as a field of action for developmental regulation?*

Biological processes of maturation and aging (inverse U-shaped trajectory), the age-graded societal scaffolding of the life course by means of institutions and prescribed age transitions (school entry, retirement), the canalization of occupational and family careers, and socially learned, normative conceptions about age-appropriate behavior and changes in (occupational, family) status

2. *What are the two components of the two-process model of intentional self-development (AAI)?*

Assimilation, persistent striving; accommodation, flexible goal adjustment

3. *What are the tenets of the Motivational Theory of Life-Span Development?*

Primacy of primary control striving; secondary control striving for motivational self-regulation; optimization of goal selection; congruence with control opportunities, consideration of the consequences for other goals, and avoidance of a selection that is too narrow; goal selection, goal engagement, and goal disengagement as discrete behavioral phases with functionally adjusted mindsets; and motivational self-regulation before and after meeting a developmental deadline

4. *What are the three components of the model of selection, optimization, and compensation (SOC model)?*

(Elective and loss-oriented) selection of functional areas; optimization, investment of resources in these preferred functional areas; compensation, attempts to compensate for developmental losses in preferred functional areas

5. *What role do developmental goals play in individual developmental regulation?*

Developmental goals organize developmental regulation, endowing behavior with direction, coherence, and meaning on the medium and long term. Incongruence between implicit motives and developmental goals is maladaptive.

6. *Are individuals completely free in the choice of the developmental goals they pursue?*

No. If the developmental goals selected are not in line with the opportunities to attain them at a given age or in a social group, goal attainment will be impossible or, at the very least, extremely difficult. Adaptive choices are characterized by congruence between developmental goals and the opportunities for their attainment.

7. *What are the major conceptual differences between the AAI model proposed by Brandtstädter and colleagues and the Motivational Theory of Lifespan Development (see also "lifespan theory of control") developed by Heckhausen and Schulz?*

The AAI model sees developmental regulation as self-regulation, whereas the lifespan theory of control conceptualizes developmental regulation as optimization of control (primary control) across the lifespan. For Brandtstädter and colleagues, the criterion for successful development is a consistent self; for Heckhausen and Schulz, it is the maximization of control potential across the life course and across life domains.

8. *What are the major conceptual differences between the MTD model and the SOC model?*

The MTD model assumes the primacy of primary control striving, whereas the SOC model estimates the functionality of

(continued)

an individual's developmental regulation based on subjective well-being. The MTD model conceptualizes goal selection (optimization) as superordinate and controlled by specific heuristics that are aligned with a long-term primary control. In the SOC model, all three strategies – selection, optimization, and compensation – are conceptualized as operating at the same level. The MTD model conceptualizes motivational meta-processes of secondary control, which is not the case for the SOC model.

9. *Which phases are distinguished in the action-phase model of developmental regulation?*

Predecisional phase and goal selection using optimization heuristics → the Rubicon of decision → non-urgent goal engagement, changing to urgent goal engagement as a developmental deadline approaches, with strategies of selective primary and secondary control as well as compensatory primary control → goal disengagement and self-protection in cases of failure, with strategies of compensatory secondary control. One of the main assumptions of the action-control model is that, to ensure the efficient use of resources, the transitions from the predecisional to the postdecisional phase of goal engagement and from the goal-engagement phase to goal disengagement are not gradual or continuous but discrete, rapid, and comprehensive.

10. *What is a developmental deadline?*

Developmental deadlines are points or stages in life at which the prospects of achieving an important developmental goal decrease sharply, such that continued goal pursuit is either futile or requires heavy investment of resources that are then no longer available for other important domains of primary control. One

example of a developmental deadline is the “biological clock” for childbearing in middle adulthood.

11. *What are the central assumptions of the lines of defense model?*

According to the lines of defense model, optimal adjustment to increasing health-related and functional limitations is achieved by means of a sequentially organized goal adjustment. This means that individuals focus on functional levels and goals that are still achievable and only disengage if they become unrealistic in order to set newly adjusted goals. Such sequential and discrete goal adjustment should be particularly adaptive in people with chronic or progressive diseases. The reverse process is also possible if individuals regain lost functional levels as a result of rehabilitation following an accident or surgery.

12. *What are the effects of incongruence between goal engagement/disengagement and opportunities for goal attainment across the lifespan?*

Incongruence of developmental goals and opportunities for their attainment leads to deterioration in psychological well-being and can result in depressive mood and inhibit primary control striving. This pattern of relationships has been found in different domains of life (e.g., family, education) and has also been observed to apply to behavior in the context of health impairments.

13. *What is the best way for people to engage in several areas of life?*

We usually have to engage simultaneously in multiple areas of life. Therefore, it is important that the goals we pursue in different domains are compatible at least with regard to their content and the behavior required for their realization. A coherent set of personal life and developmental

goals is an important prerequisite for a fulfilling life, which applies in particular to old age.

14. *To what extent can individual developmental regulation be seen as a dynamic interaction between development and motivation?*

It is as a result of the individual's active influence on his or her own devel-

opment through goal pursuit that the opportunities and constraints of the situation really come to bear. Not only are individuals producers of their future, they actively influence their own future developmental ecology by means of selection, evocation, and manipulation, thus setting the stage for their future developmental regulation.

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