Being on-time or off-time: 
Developmental deadlines for regulating one's own development

Carsten Wrosch\textsuperscript{1} and Jutta Heckhausen\textsuperscript{2}
\textsuperscript{1} Concordia University 
\textsuperscript{2} University of California, Irvine

Abstract

This chapter proposes a model of adaptive processes of developmental regulation (e.g., control striving, goal setting) around age-graded developmental deadlines. Developmental deadlines are characterized by a radical shift from a favorable (more opportunities, less constraints) to an unfavorable (less opportunities, more constraints) developmental ecology for a given goal. They are based on the age-graded structure of constraints (biological, socio-structural, age-normative) across the life course. These constraints help to structure, anticipate, and plan the life-course timing of various developmental goals. Based on the life-span theory of control (J. Heckhausen & Schulz, 1995), we propose adaptive strategies for regulating one's own development that are conceptually differentiated into selective primary (investment of internal resources), compensatory primary (investment of external resources), selective secondary (volitional focus), and compensatory secondary control (e.g., self-protection and goal disengagement). The proposed model integrates the life-span theory of control with a motivational model of action regulation (i.e., Rubicon model, H. Heckhausen, 1989). Individuals' control strategies are expected to be selectively activated before and after developmental deadlines and thereby should facilitate successful development. Individuals who approach a certain deadline enter into an urgency phase and should enhance their efforts to reach the intended goal. By contrast, individuals who missed a deadline are expected to show a radical shift from urgent goal striving to goal disengagement and efforts to compensate negative consequences of failure. Findings from two studies investigating age-graded developmental deadlines in partnership relations and child bearing are discussed.

Key words: Developmental Deadlines, Life-Span Development, Primary Control, Secondary Control, Action Regulation, Developmental Regulation, Disengagement
The human life course provides a rich set of possible developmental pathways individuals can choose, follow, or disengage from. The repertoire of viable life-course pathways, however, is canalized by age-graded constraints throughout the life course. A corollary of this principle is that age-graded constraints determine the opportunities for realizing important life goals. For example, the opportunities for goal attainment can change from plentiful to sparse if people advance in age (e.g., having a child at twenty versus forty years of age), a phenomenon that we call a “developmental deadline” (J. Heckhausen, 1999; Wrosch, 1999). In the first part of this chapter, we discuss different factors that determine the age-graded structure of the life course. This discussion leads to a model of adaptive control processes involved in the management of personal goals before and after the occurrence of a developmental deadline. It is argued that age-graded opportunities and constraints guide the individual’s striving for developmental goals. In addition, successful developmental regulation is conceptualized as an adaptive fit of a person’s control potential with age-graded constraints. In the second part of this chapter, the life-span theory of control (J. Heckhausen & Schulz, 1995; Schulz & J. Heckhausen, 1996) is discussed as a theoretical and empirical framework that postulates age-graded control processes to strive for the attainment of chosen goals and to cope with the emotional turmoil resulting from failure. At times of favorable opportunities, the individual should intensify active investments in goal striving. During age phases with sharply reduced opportunities and salient constraints, however, the individual should deactivate goal striving and invest in alternative goals. The third part of this chapter proposes a model of adaptive developmental regulation around developmental deadlines, labelled as the "Extended Model of Action Phases" (J. Heckhausen, 1999; J. Heckhausen, Wrosch, & Fleeson, 2001; Wrosch, 1999; Wrosch & Heckhausen, 1999). Developmental deadlines are described as prototypical phenomena of the interplay between age-graded constraints and individual control behavior. The concept of developmental deadlines allows to investigate a person’s response to changing opportunity structures in terms of personal goal setting and control striving. This model hypothesizes adaptive processes of developmental regulation when individuals approach a deadline, pass a deadline successfully, or pass a deadline without achieving the intended goal. Empirical evidence concerning the proposed model is discussed with respect to developmental regulation around two developmental deadlines: 1) having your own children (J. Heckhausen, Wrosch, & Fleeson, 2001) and 2) forming an intimate relationship (Wrosch & Heckhausen, 1999).

Timing of developmental goals across the life course: The impact of biological, socio-structural, and age-normative factors. For the past five decades, life-span developmentalists and life-course sociologists have become interested in the time-ordered frame of the life course for individual development. Particularly influential were conceptual models of identity development (e.g., Erikson, 1963, 1968) and developmental tasks (e.g., Havighurst, 1953, 1967). These models postulate that successful development depends on effective management of age-graded developmental tasks or psycho-social crises. Failure to master age-graded challenges should result in dissatisfaction, social rejection, and difficulties regarding the solution of further tasks.

What are the relevant factors that comprise the age-graded structure of the life course and thus scaffold individual development? A classification of factors underlying the age-graded structure of the human life course has been proposed by J. Heckhausen and Schulz (1995).
They differentiate age-graded constraints into biological, socio-structural, and age-normative factors. We note that the impact of these factors does not only vary across the human life course, but also may be affected by socio-historical and cultural change (e.g., history-graded factors; Baltes, Cornelius, & Nesselroade, 1979).

**Biological factors** are related to relatively universal patterns of change based on maturation and aging. Overall, biological change produces an inverted U-curve pattern of functional capacity across the human life span. During childhood and adolescence, maturation promotes the organism from complete helplessness to a well-functioning individual. In early and middle adulthood, maturation is complete and aging has not yet significantly compromised functioning. From middle adulthood on, biological aging negatively affects personal functioning and leads to a progressive decline in competencies and resources in old age. For example, objective markers of biological decline, such as cognitive skills and capacities (Baltes, 1987) are decreasing with age, especially at the limits of individual performance (Baltes & Kliegl, 1986; Kliegl, Smith, & Baltes, 1989). This cycle of growth and decline is also reflected in lay persons' conceptions about development. Adults at different age levels consensually expect an increase of undesired change in old age (J. Heckhausen & Baltes, 1991).

**Socio-structural and institutional constraints** are anchored in modern societies in legislative rules for the age-timing of life course transitions such as school entry or retirement, in socio-demographic structure such as the age-graded marriage market, and in corporate rules about age and sequences of promotion. Implicit and explicit restrictions based on chronological age provide a structure for entry and transition times of developmental projects. For instance, institutionalized age strata for specific professional careers can obstruct the attainment of intended life-course tracks when individuals are too old. The age-sequential structure of the life course (Sørensen, 1990) furnishes sequentially organized patterns in terms of opportunities and constraints for the attainment of developmental goals. Thus, the realization of possible goals in late midlife and old age can be obstructed when a person’s age does not fit with socially structured patterns of age-graded developmental tasks. The impact of age-graded socio-structural and institutional constraints (for education, promotion, family formation, etc.) implies for the individual that an age-appropriate timing (Hagestad & Neugarten, 1985) of personal goals facilitates successful development. Using opportunities at the right time in life helps to attain positive outcomes, while trying to attain life-course achievements against external constraints ("swimming against the stream") bears high costs for a person’s resources.

In general, it can be assumed that social structure and societal institutions provide an age-graded timetable of life-course transitions that canalize the choice and the focus with respect to different development pathways (Hagestad, 1990). The social structure of modern societies with high levels of social mobility shows in spite of constraining factors much variability in terms of viable developmental pathways. Thus, individuals play an active role in shaping their own developmental pathways.

**Age-normative conceptions** about development influence the selection of developmental tracks across the life course. Age-normative conceptions are described as socially shared conceptions about change from birth to death (Hagestad & Neugarten, 1985). They can be
understood as social constructions of reality and represent assumptions about the normative life course and age-appropriate behavior (Berger & Luckmann, 1966; Neugarten, 1969; Neugarten, Moore, & Lowe, 1968). Normativity is considered to be present in a given society when two conditions are fulfilled: a consensus within a community and social sanctioning in case of norm violation (Udry, 1982). Empirical evidence for a high consensus in age-normative conceptions has been reported by Neugarten, Moore, and Lowe (1968). Neugarten and colleagues identified highly consensual conceptions about the ideal timing of life-course events and transitions like the age of marriage (age range: 19-25; congruence: 80-90%), starting a career (age range: 20-22; congruence: 82-86%), retirement (age range: 60-65; congruence: 83-86%), and the age one has the most responsibility in life (age range: 35-50; congruence: 75-79%). Moreover, these consensual normative conceptions reflect the underlying biological and social structure of the life course (Nurmi, 1992). The findings of a high consensus in age-normative conceptions could be replicated in studies conducted more recently (Zepelin, Sills, & Heath, 1986-87) and in a different cultural context (Japan; Plath, & Ikeda, 1975).

Normative conceptions can significantly influence the choice of developmental goals, the investment of personal resources in realizing and elaborating chosen developmental tracks, and the process of adaptation after failing to achieve a goal. Two general features characterize the role of normative conceptions for processes of developmental regulation. First, they inform the individual about opportunities and risks concerning intended developmental outcomes (J. Heckhausen, Hundertmark, & Krueger, 1992). Thus, individuals may optimize their own development by investments of increased effort in protecting and accelerating intended developmental processes. Moreover, the subjective internalization of age-normative conceptions may enhance a person’s commitment to strive for intended goals within the normative time frame (Hagestad & Neugarten, 1985). Thus, normative conceptions may function as social reference frames (Festinger, 1954) that provide typical models of possible behavior. Individuals who are "on time" concerning their developmental processes usually have a set of peers who can provide social support (Brim & Ryff, 1980). By contrast, individuals who are "off-time" often have to invest much more internal resources for compensating the missing socio-structural support (Wrosch & Freund, 2001). In addition, normative conceptions are markers for developmental deadlines that indicate when individuals have to disengage from unattainable goals (J. Heckhausen & Lang, 1996). In this case, normative conceptions can prevent a person from investing resources in futile developmental projects. This latter function of normative conceptions should be highly adaptive, given that it may prevent a person from wasting his/her personal resources.

Second, normative conceptions may function as a reference frame to protect the individual’s self-esteem against negative emotional consequences of failure and developmental losses by comparing the own standard with negative age stereotypes. These processes have been described in the literature as downward comparisons (Wills, 1981) or social downgrading (J. Heckhausen & Brim, 1997). It may serve self-protective functions, for instance, when older adults assume that most other people at a similar age are more forgetful or less mobile as compared to themselves.

To summarize, the biological, societal, and age-normative structuring of the life course produces an age-graded timetable for developmental tasks (Havighurst, 1953). Developmental
tasks play a relevant role in the ordering of major life-events across the life course. They are generally related to normative development and arise at or about a certain period in the life of an individual (Havighurst, 1967). Various studies provide evidence that individuals select their developmental goals at any given age in accordance with their respective developmental tasks. Nurmi (1992), for instance, reported that goals and interests of adults are well adapted to the respective age-congruent developmental tasks. Similarly, J. Heckhausen (1997) found congruence between nominated developmental goals and major markers of the social and biological structure of the life course (e.g., health, work, leisure). Thus, age-graded normative tasks provide a general plan to selectively invest personal resources (Cantor, Norem, Langston, Zirkel, Fleeson, & Cook-Flannagan, 1991). Accordingly, the individual is challenged to manage the impact of constraining factors on development as well as to actively select and promote intended development pathways.

Processes of developmental regulation: Optimization in primary and secondary control. Individuals take an active part in shaping their own development (Lerner & Busch-Roßnagel, 1981). People select goals, strive for their attainment, and manage the consequences resulting from success and failure. As mentioned above, we conceptualize successful developmental regulation as an adaptive fit of the individual’s striving for developmental goals to the biological, socio-structural and age-normative constraints of development. This position holds that successful development can be achieved by a functional (age-adjusted) goal selection, a high focus on and realization of attainable goals, and the deactivation of unrealistic intentions (J. Heckhausen, 1999). The life-span theory of control (J. Heckhausen & Schulz, 1995; Schulz & Heckhausen, 1996) identifies two fundamental requirements of human behavior and proposes a set of adaptive strategies to select appropriate goals, to focus on chosen goals, to realize the goal intentions, and to cope with the motivational and emotional turmoil resulting from failure. Moreover, the life-span theory of control considers different developmental ecologies across the human life course and postulates adaptive primary and secondary control strategies for mastering age-graded developmental challenges.

Human behavior is less predictable, as compared to other species, because of the huge diversity of possible developmental pathways. Moreover, behavioral variability generally enhances the likelihood of failure, with its consequences in terms of frustration and negative self-image. This notion of variability in human behavior implies that the individual has to manage two basic requirements throughout the life span: selectivity and failure compensation (J. Heckhausen & Schulz, 1995; Schulz & Heckhausen, 1996). First, the variability of goals and behavior requires the individual to be selective. Possible alternatives of future development have to be carefully deliberated and a certain developmental pathway needs to be selected. Thus, individuals need strategies to decide for the one and against the other alternative. Once a decision is made, the motivational commitment to this decision needs to be high and resilient against conflicting action alternatives (e.g., Kuhl, 1983). The second key requirement results from the vulnerability to failure experience. Greater behavioral variability enhances the likelihood of experiencing failure and might lead to negative consequences in terms of frustration and self-image. Therefore, individuals also need strategies to compensate for the negative impact of failure on self-esteem.
What are the means and strategies, humans can use to manage the described requirements of developmental regulation and to attain intended developmental outcomes? To approach this question, the life-span theory of control has adopted the dual process conception of primary and secondary control (Rothbaum, Weisz & Snyder, 1982) and elaborated in a developmental context. Rothbaum and colleagues (1982) have defined primary control as individuals' attempts to gain control by bringing the environment into line with their wishes. Secondary control, by contrast, has been defined as individuals' attempts to gain control by bringing the self into line with the environmental constraints. The distinction between primary and secondary control is conceptually related to other models of adjustment like accommodation and assimilation (Brandtstädter & Renner, 1990; Brandtstädter, Wentura, & Greve, 1993), or problem-focused and emotion-focused coping (Folkman & Lazarus, 1980; Lazarus & Launier, 1978), although there are important conceptual differences (see J. Heckhausen, 1999).

J. Heckhausen and Schulz (1995; Schulz & Heckhausen, 1996) have postulated a functional primacy of primary control. This position holds that both primary and secondary control strategies are adaptive, insofar as they optimize the individual’s long-term potential for primary control. Primary control supports this goal directly, given that the individual can profit from the positive consequences of successful goal attainment. The two functions of secondary control are 1) to optimize selective volitional investment and 2) to compensate for the negative emotional and motivational consequences of failure.

By integrating the distinction between primary and secondary control with the two fundamental requirements of human behavior (selectivity and failure compensation), the life-span theory of control defined four different types of control strategies: selective primary, compensatory primary, selective secondary, and compensatory secondary control. In addition, a higher-order process, referred to as optimization, is expected to regulate the adaptive use of the four control strategies. Table 1 illustrates the proposed processes of developmental regulation that are the basic elements of the model of optimization in primary and secondary control (OPS model; e.g., J. Heckhausen, 1999; J. Heckhausen & Schulz, 1995).

**Optimization** helps individuals to use control strategies most effectively or to design alternative action plans when an intended goal is unattainable. Another function of optimization is to select goals for primary control, which fit the opportunities and constraints of an individual. In addition, optimization processes safeguard a certain degree of diversity. Finally, optimization supports the management of positive and negative trade-offs for different life domains and future development.

**Selective primary control** striving is defined as the investment of internal resources, such as time and effort, the development of relevant skills, or an increased effort when obstacles emerge. These strategies are aimed directly at the realization of chosen developmental goals. **Compensatory primary control** strategies are described as an active search for help and advice, the use of unusual means, and taking a detour for achieving a goal. In situations in which selective primary control is not sufficient to attain a goal, compensatory primary control is needed. Such situations might occur when individuals' internal resources are depleted or the opportunities for goal attainment are expected to become less favorable.
Selective secondary control supports individuals' volitional focus on a chosen goal. This type of strategy is described as enhancement of the goal value, devaluation of competing goals, enhanced perception of control, or the imagination of positive consequences of goal attainment. Selective secondary control striving strengthens the individual commitment to chosen developmental tracks and therefore enhances the likelihood of persistence in goal striving and helps to identify and use favorable opportunities to implement personal intentions. Compensatory secondary control strategies are described as goal disengagement, self-protective attributions, and social or intra-individual comparisons. This set of strategies helps individuals to cope with the negative consequences resulting from failure in two different ways. First, they directly consist of self-protective processes (e.g., attributional biases, downward comparisons). Second, personal resources can be protected by redirecting time and energy to other goals or life domains that involve more favorable opportunity structures for goal attainment (e.g., disengagement). In so doing, a person prevents accumulated failure experience and keeps being engaged in the attainment of other important goals (cf. Wrosch, Scheier, Carver, & Schulz, in press).

Schulz and Heckhausen (1996) have postulated hypothetical life-span trajectories for primary and secondary control. Figure 1 shows that primary control is expected to increase in young adulthood, to plateau in middle adulthood, and to decrease in old age. By contrast, secondary control is expected to develop in early childhood and to increase over the entire life span. Secondary control becomes increasingly important in old age, because of its compensatory function in individuals who face developmental losses (compensatory secondary control). In addition, it can be assumed that enhanced commitment towards personal goals (selective secondary control) may support a persistent striving for goal attainment when internal resources (selective primary control) become increasingly reduced in old age. In a similar vein, Gollwitzer and colleagues (Gollwitzer & Moskowitz, 1996; Wicklund & Gollwitzer, 1982) argued that a strong commitment to goals stimulates compensatory efforts when failure is experienced.

Irrespective of losses in objective control potential, the need for primary control (J. Heckhausen, 1999) should remain stable across the life span (see Figure 1). It is expected that an increasing use of secondary control strategies protects the motivational and emotional resources and helps the individual to focus on age-adjusted developmental tasks. The empirical evidence for the hypothetical life-span trajectories for primary and secondary control, however, is only partly supportive. On the one hand, substantial evidence has demonstrated an increase of secondary control striving across the life course (e.g., Brandstädter & Renner, 1990; Brandstädter, Wentura, & Greve, 1993; J. Heckhausen, 1997; Peng & Lachman, 1993; Wrosch & Heckhausen, 1999, 2002). On the other hand, with regard to primary control striving, the findings from different studies are less consistent; they indicate either stability (J. Heckhausen, 1997; Peng & Lachman, 1993), or decrease (e.g., Brandstädter & Renner, 1990; Brandstädter, Wentura, & Greve, 1993), or increase (Wrosch, Heckhausen, & Lachman, 2000) across adulthood and old age.

Developmental deadlines: Motivational responses to changing opportunity structures across the life course. We have argued earlier that biological, socio-structural, and age-normative factors scaffold the developmental opportunities for realizing specific goals across the human
life course. As a consequence of such age-graded influences, goals that are easily attainable in young adulthood can sometimes hardly be realized in late midlife and old age (e.g., child bearing). The concept of developmental deadlines (J. Heckhausen, Wrosch, & Fleeson, 2001; J. Heckhausen, 1999; Wrosch & Heckhausen, 1999) specifically addresses this phenomenon of changing opportunity structures for goal attainment across the adult life span. Around developmental deadlines, opportunities for attaining a specific goal change from plentiful to sparse, while constraints change from minor to major.

The concept of developmental deadlines integrates the life-span theory of control with a motivational model of action phases (i.e., Rubicon model, H. Heckhausen, 1989). This integration is summarized in a new model that assumes different processes of developmental regulation when individuals approach a deadline, pass it successfully, or cross the deadline without attaining the goal. The model itself will be described below as the "Extended Model of Action Phases" (J. Heckhausen, 1999). We note that the concept of adaptive regulation processes around deadlines is not exclusively related to developmental phenomena. It could also be used as a theoretical framework to study human action regulation in a broader, more general context.

Developmental deadlines are defined as final reference points to realize a certain goal (J. Heckhausen, 1999; J. Heckhausen, Wrosch, & Fleeson, 2001; Wrosch, 1999). A typical example is the biologically based developmental deadline for child bearing. Beyond age forty, fertility in women greatly decreases while risk pregnancies increase in likelihood. Similar shifts from facilitative to inhibitory conditions can be found for various developmental tasks (e.g., settle into a career), as indicated by research on implicit and explicit age norms and deadlines for the timing of life-course transitions (Settersten & Hagestad, 1996a, 1996b).

Deadlines for different developmental tasks may vary in age-timing and in the term of abruptness of the shift from conducive to inhibitory conditions. For example, some work-related deadlines like entering vocational training characterize young adulthood, whereas deadlines for the postponement of child bearing should influence individual development especially in middle adulthood. In late midlife and old age, for example, individuals confront deadlines for continuing work or being in perfect health. In addition, developmental deadlines vary in terms of their modifiability (malleability). Biologically based deadlines (e.g., having a child after menopause) are less subject to individuals' attempts of surmounting them. For biological deadlines, constraints can hardly be overcome by intense investment of effort and psychological commitment. Age-normative conceptions, by contrast, can be ignored, although often at a substantial cost. The individual can choose to take a non-normative path. Despite this variability in life-course timing and intensity of change in opportunity structures, deadline phenomena are related to a substantial shift from a favorable developmental ecology (more opportunities, less constraints) to an unfavorable developmental ecology (more constraints, less opportunities) with respect to a specific developmental goal.

Developmental regulation around transition points like intention formation or deactivation requires individuals to perform a shift in motivational behaviors. The Rubicon model of action phases (H. Heckhausen, 1989) segments the action process into four different phases: a predecisional motivational phase, a preactional volitional phase, an actional volitional phase,
and a postactional motivational phase. During the predecisional phase, the individual evaluates the pros and cons of different action alternatives. The formation of a certain goal marks the transition from a predecisional to a preactional phase. This transition point has been labelled by H. Heckhausen (1989) as "Rubicon passage", because it implies that the individual is now in a fundamentally different motivational mindset (Gollwitzer, 1996). In several studies cognitive indicators of motivational mindsets (e.g., informational focus, memory content) were investigated in subjects that were either in pre-Rubicon or post-Rubicon situations (e.g., H. Heckhausen, 1989; H. Heckhausen & Gollwitzer, 1987). H. Heckhausen and colleagues showed that individuals switch from a deliberative to an implemental mindset after crossing the Rubicon. In the preactional phase, the individual is concerned with searching favorable opportunities to implement the chosen goal. The function of the actional phase is then to implement the intention. In the postactional phase, the individual is evaluating the action outcome as well as the consequences for prospective action cycles (e.g., H. Heckhausen, 1989). This line of research gathered substantial empirical evidence for different motivation-based processes of action regulation before and after different transition points of the action cycle.

The issue of intention deactivation has so far been empirically neglected (Wrosch et al., in press). Intention deactivation, however, is expected to be most revealing about the fundamental process of action regulation (H. Heckhausen & Beckmann, 1990). In the context of age-graded deadlines, the detriment of opportunity structures requires the individual to adaptively manage hardly attainable goals and prospective development. To conceptualize adaptive regulation processes around developmental deadlines, we propose a model that integrates the deadline transition with the Rubicon model and specifies processes of adaptive regulation for different action phases. This model, as illustrated in Figure 2, is labelled the "Extended Model of Action Phases: Rubicon and Deadline" (J. Heckhausen, 1999; J. Heckhausen, Wrosch, & Fleeson, 2001; Wrosch, 1999).

The extended model of action phases describes action regulation on four different levels (see vertical hierarchy of levels in Figure 2). First, critical transition points are described as Rubicon and Deadline. Second, five different motivational phases are distinguished at the level of action phases. As in the Rubicon model, the Rubicon marks the intention formation and is defined as the transition from a predecisional phase to the requirements of volitional planning; the postdecisional or preactional phase. Going beyond the Rubicon model, the extended model of action phases divides the actional phase into two subphases: a non-urgent actional phase and an urgent actional phase. The non-urgent actional phase is characterized by a developmental ecology that involves plenty of time and opportunities before reaching a deadline (e.g., having a child in your early twenties). In the urgent actional phase, the circumstances have changed. The individual is approaching a deadline and might expect a decline of opportunities for goal attainment (e.g., having a child in your late thirties). The deadline itself is a transition from an urgent actional phase to a postactional phase (post-deadline). After crossing the deadline, the opportunities for prospective goal attainment have become considerably reduced and therefore do not warrant a successful effect of continued actions, but call for a deactivation of goal intentions.
Third, the extended model of action phases conceptualizes adaptive processes of developmental regulation for the proposed action phases. These processes are theoretically based on the different elements of the OPS model (optimization, selective primary control, compensatory primary control, selective secondary control, compensatory secondary control). Fourth, the adaptive functions of phase-congruent processes of developmental regulation processes are specified. They are illustrated in the boxes of Figure 2.

In the predecisional phase, optimization processes like an age-appropriate choice of developmental tasks should support the individual’s development insofar as a well-adjusted selection of developmental goals enhances the opportunities and consequences for goal realization. In addition, the management of trade-offs between domains has to be considered in the predecisional phase to reduce inter-domain conflicts. Moreover, concerns of maintaining diversity of action possibilities may help to design alternative action plans that become especially important when individuals fail to attain a goal.

Individuals enter the volitional phases by crossing the Rubicon (forming an intention). The three volitional phases of preactional, actional non-urgent, and actional urgent require various degrees of selective investment into the attainment of a chosen goal. In general, it is assumed that in volitional phases selective primary as well as selective secondary control is required to enhance the likelihood of goal attainment. Selective primary and selective secondary control strategies comprise processes of action planning, action initiation, and an enhanced volitional commitment. Especially, selective primary control strategies such as an investment of internal resources are directly aimed at realizing a chosen goal. Selective secondary control strategies, such as enhancing the goal value or devaluing non-chosen goals help the individual to motivationally focus on the positive consequences of goal realization and thus strengthen personal goal commitment.

Individuals who move towards a developmental deadline for a self-relevant goal should experience an increase of time pressure. Moreover, it is expected that they should be prompted to use control strategies characteristic of the actional phases (J. Heckhausen, Wrosch, & Fleeson, 2001; J. Heckhausen, 1999). Goal-directed efforts should be intensified as the individual experiences or anticipates the waning of opportunities for goal attainment. Therefore, during the urgent actional phase, individuals should show an increased use of selective primary and selective secondary control striving. In addition, compensatory primary control might prove to be an efficient strategy for compensating the lack of remaining time by activating external resources (e.g., help and advice) and using unusual means.

After passing the deadline, individuals are confronted with a radical shift in their opportunities to attain a goal. Future developmental regulation is influenced by post-deadline processes, dependent on whether individuals have or have not attained the goal. On the one hand, individuals who have realized the chosen goal within the normative time frame should profit directly from this. The extended model of action phases assumes processes of capitalization on the attained success for prospective action cycles. Individuals can direct their resources to further goal striving in the same domain or may switch to developmental goals in other life domains. On the other hand, individuals who passed the deadline without attaining the goal should show a radical shift from urgent efforts of goal realization to goal
disengagement processes, and compensatory secondary control in general. The adaptive role of compensatory secondary control in the post-deadline phase, after failing the goal, can be described in two ways (e.g., Wrosch, 1999; Wrosch & Heckhausen, 1999). First, the deactivation of the goal intention may redirect the individual’s internal resources to other life domains with comparatively more favorable opportunity structures. Therefore, the deactivation process prevents a person from perpetuating degenerated intentions and experiencing accumulated failure experiences (H. Heckhausen & Beckmann, 1990; Wrosch et al., in press). Second, the individual’s emotional and motivational resources after passing the deadline without goal attainment need to be protected. Compensatory secondary control strategies (e.g., external attributions or downward comparisons) may protect the individual’s self-esteem and strengthen the primary control potential for prospective actions.

Empirical evidence for different processes of developmental regulation before and after passing a developmental deadline. One line of research that has provided evidence concerning the consequences of missing a deadline investigated age norms for life-course events and transitions (Settersten and Hagestad, 1996a, 1996b). The authors studied the perceived existence of prescriptive age norms, the reasons for age norms, and the consequences of missing them. These phenomena of age-related transitions are labelled by Settersten and Hagestad (1996a, 1996b) as "cultural age deadlines". The authors measured deadlines similarly to the assessment of perceived normative conceptions with respect to a certain life-course transition. For example, they asked, "When should a man be married?" to identify the marriage deadline for males. Despite the fact that Settersten and Hagestad's criteria for defining age deadlines are substantially broader than those used in our own research (e.g., change in opportunity structures, final reference points), the results of their studies provide relevant information concerning the proposed model.

Settersten and Hagestad (1996a, 1996b) could identify age norms for various family-related transitions (e.g., leaving home, marriage, parenthood) and work-related transitions (e.g., settle into a career, peak of work career, retirement). With respect to the reasons for age-related deadlines, sequencing and developmental arguments were reported most frequently. In addition, more relevant to the proposed model, perceived consequences of missing developmental goals within the normative time frame were reported. Although nearly fifty percent of participants perceived no consequences of missing developmental goals within the normative time frame, the most frequently mentioned consequences were developmental consequences, such as a negative impact on personal abilities, needs, and goals. These findings support our general assumption that developmental deadlines are relevant transition points for regulating personal development. The reason that more than half of participants did not mention any consequences of missing age-related deadlines can be partly attributed in the method used by Settersten and Hagestad (1996a, 1996b). The reported data are based on responses concerning generalized other people missing age norms and therefore are not necessarily related to respondents’ internal regulation processes. Moreover, missing the ideal or normative age timing does not typically imply missing the event or life-course transition altogether as would be the case in our presented model of developmental deadlines (particularly for biologically-based deadlines). If mere postponement of critical life-course events is expected to cause serious negative consequences in 50% of the cases, what would the drawbacks be for missing the event altogether? Thus, the findings from Settersten and
Hagestad presumably underestimate the negative consequences of missing developmental deadlines.

Another line of research has explicitly examined the proposed model of developmental regulation (J. Heckhausen, 2000; J. Heckhausen & Tomasik, 2002; J. Heckhausen, Wrosch, & Fleeson, 2001; Schulz, Wrosch, & Heckhausen, in press; Wrosch & Heckhausen, 1999, 2002; Wrosch, Heckhausen, & Lachman, 2000; Wrosch, Schulz, & Heckhausen, 2002). These studies are based on a different methodological approach (e.g., quasi-experimental design), investigating developmental regulation processes in participants who face objective differences in opportunity structures (e.g., different age groups, different types of health problems). For example, recent studies have shown that self-protective secondary control processes become particularly beneficial in older adults who are confronted with managing severe life regrets (Wrosch & Heckhausen, 2002) or high levels of health and financial challenges (Wrosch, Heckhausen, & Lachman, 2000). In addition, active engagements into attaining health goals have been shown to benefit those older adults who face acute physical health problems, but not so much those older adults who confront functional health problems (Wrosch, Schulz, & Heckhausen, 2002). Moreover, the deadline model has been applied to the transition from school to work. In longitudinal research, the use of control strategies has been examined in adolescents who are seeking apprenticeship positions before graduating from high school (J. Heckhausen and Tomasik, 2002). Finally, two studies examined control processes before and after passing a developmental deadline with respect to the attainment of childbearing goals (J. Heckhausen, Wrosch, & Fleeson, 2001) and intimate partnership goals (Wrosch & Heckhausen, 1999). These studies can be considered as an empirical starting point of this research program and are discussed in the remaining part of this chapter.

Developmental deadlines for child bearing. One of the most obvious developmental deadlines in the human life course is related to the timing of child bearing for women. Child bearing is assumed to be one of the most universal and relevant developmental tasks (Havighurst, 1953) that individuals are expected to master in adulthood. However, mastering this task is dependent on a life-time schedule determined by biological change. Beyond age forty, fertility rates in women exhibit a radical decline. J. Heckhausen, Wrosch, and Fleeson (2001) addressed this issue by investigating developmental regulation processes (goal setting and cognitive indicators of motivational mindsets) in three groups of women. First, childless women between age 40 and 45 were examined. It was assumed that these women have recently passed the childbearing deadline. Second, women without a child between age 27 and 33 were examined, assuming that these women had entered an urgency phase. Third, women between age 20 and 45 who had born a child in the last year were investigated as a success group. It was expected that women in the urgency group would invest more effort with respect to child bearing. By contrast, women who already passed the deadline should show disengagement from the goal of having their own children. For the group of women with a recently born child, the extended model of action phases would predict that they should capitalize their success in further action cycles (e.g., child rearing, second child). Therefore, the main difference was expected between the group of women that passed the deadline and the two other groups.
The findings of the study (J. Heckhausen, Wrosch, & Fleeson, 2001) generally supported the hypotheses. With respect to goal setting, women who already had passed the deadline reported more frequently goals that were not related to children and fewer goals addressing child bearing and child rearing. Women in the urgency group, by contrast, reported more frequently goals that were related to child bearing. Finally, women with a young child reported high levels of child rearing goals.

In addition, a cognitive indicator of motivational mindsets was measured in terms of incidental memory (J. Heckhausen, Wrosch, & Fleeson, 2001). The underlying procedure involved sentences that had to be recalled after the presentation of a distracter. Women in the urgency group recalled more sentences related to children, independent on the valence (positive, negative) of the sentences. In addition, sentences that were related to compensatory secondary control strategies (e.g., attributional biases) were more frequently recalled by women who had passed the deadline. Moreover, women who had failed the deadline recalled more sentences related to attributions that avoided self blame for childlessness compared with women having an infant child. The finding that women in the urgency phase not only recalled positive but also negative words at a higher frequency may be somewhat surprising. Apparently, the urgency involved in having their own children had a general salience effect on all child-related stimuli.

In a second study, J. Heckhausen, Wrosch, and Fleeson (2001) examined the use and function of specific control strategies in groups of women who had and had not passed the deadline for having their own children. As expected by our model, women who did not pass the deadline reported particularly high levels of selective primary, compensatory primary, and selective secondary control, whereas women who already had passed the deadline reported particularly high levels of compensatory secondary control. In addition, among those women who already had passed the deadline, those who failed to disengage from the goal of having their own children (phase-incongruent control strategy) reported particularly high levels of depressive symptomatology. The latter finding seems to be particularly important, because it points to the conclusion that there are substantial individual differences in the use of opportunity-adjusted control strategies. In addition, these individual differences were reliably associated with indicators of subjective well-being (see also Wrosch & Heckhausen, 1999).

Developmental deadlines for partnership relations. Another study examined developmental regulation processes around partnership deadlines (Wrosch, 1999; Wrosch & Heckhausen, 1999). The theoretical rationale of this study is based on findings concerning different opportunity structures for partnership realization in young and older separated individuals. For example, the objective remarriage expectancy following a divorce is above eighty percent for a 30-year old individual, whereas a 60-year old individual has a probability of less than twenty percent to marry again in his/her remaining life time (e.g., Braun & Proebsting, 1986). The reason for this dramatic age-related change of opportunity structures is mainly based on socio-demographic constraints, that is a greatly reduced marriage market in older ages (Klein, 1990). The proposed extended model of action phases would assume for separated individuals in young adulthood that they are far from passing a partnership deadline, given that they have enough remaining time and favorable opportunity structures to build a new intimate partnership. Therefore, we expected to find substantial efforts to realize a new
partnership. Separated individuals in late midlife, by contrast, often can hardly realize a new partnership, because they face a constrained partnership market. Therefore, we expected that older separated adults would disengage more fully from partnership goals and redirect their resources to other domains with more favorable opportunity structures.

The partnership deadline study (Wrosch, 1999; Wrosch & Heckhausen, 1999) investigated the following developmental regulation processes in recently separated individuals in early adulthood (21-35 years), late midlife (49-59 years): goal setting, partnership-related control striving, and cognitive indicators of motivational mindsets. In addition, recently committed individuals with a similar age range were examined as a comparison group.

The findings strongly supported the predictions (Wrosch & Heckhausen, 1999). Separated individuals in early adulthood reported more gain-oriented partnership goals than separated individuals in late midlife did. In addition, younger as compared to older separated individuals reported a higher control striving aimed at the realization of a new partnership (i.e., selective primary and selective secondary control). In contrast, separated individuals in late midlife reported more compensatory secondary control, especially goal disengagement, as compared to their younger counterparts. Moreover, the findings with respect to the cognitive orientation of recently separated participants, measured in terms of incidental memory (recall of positive and negative aspects of partnerships), indicated that older separated adults showed a more pronounced cognitive orientation towards negativity, whereas younger separated adults turned to a comparably positive cognitive orientation.

Even more importantly, the study demonstrated age-differential effects of compensatory secondary control on emotional adjustment of separated adults, across a longitudinal time span of 15 months. Whereas older participants improved their emotional well-being if they invested high levels of (phase-congruent) compensatory secondary control, younger participants suffered decline in emotional well-being if they disengaged from partnership goals (use of phase-incongruent control strategies). These findings demonstrate the adaptive value of opportunity-adjusted control striving. In addition, they lead to the conclusion that those individuals who do not adjust their control processes to the opportunities for goal attainment might show poor development outcomes.

Conclusion. This chapter addressed adaptive processes of developmental regulation around developmental deadlines. We have proposed that, around developmental deadlines, opportunity structures change and thereby require the individual to increase efforts of goal attainment before approaching the deadline and to disengage from the respective goal after the deadline has passed. The results of the reported studies demonstrated that developmental deadlines organize individuals' developmental regulation processes. Individuals adapt their control-related behaviors to the respective opportunity structures of their developmental goals. Favorable opportunity structures afford motivational processes directed at maximizing primary control. By contrast, situations with severely constrained or absent opportunities call for motivational processes that support emotional stability and facilitate disengagement from unattainable goals. Accordingly, the findings support our assumption that individuals shift their control striving from urgent realization efforts before passing a developmental deadline to goal disengagement and compensatory secondary control after passing a deadline.
In addition, the reported studies have demonstrated the beneficial effects of opportunity-adjusted control striving. Those individuals who adjusted their control-related behaviors to the opportunities for goal attainment improved their subject well-being. In contrast, opportunity-incongruent control striving was shown to be related to low levels of subjective well-being.

The research paradigm of developmental deadlines has demonstrated its usefulness in studying developmental processes. The paradigm should thus be used to study developmental transitions in other life domains and phases of the life span. In particular, control-related behavior around developmental deadlines should be studied longitudinally. A longitudinal approach would allow to investigate micro-sequential processes of adaptive control behavior around developmental and thereby may reveal functional relations between individuals’ use of control strategies, outcomes of behavior, and psychological adjustment. Several such studies are currently underway in domains of work, health, and social relations. Thus, by using the proposed theoretical model, future research may provide relevant information about fundamental processes of action regulation around critical transitions across the human life course.

References


Wrosch, C., Scheier, M. F., Carver, C. S., & Schulz, R. (in press). The importance of goal disengagement in adaptive self-regulation: When giving up is beneficial. *Self and Identity*.


Table 1.
OPS-Model: Optimization in primary and secondary control

Optimization

- adaptive goal selection: long-term and age-appropriate goals
- management of positive and negative trade-offs for other life
domains and future life course
- maintain diversity, avoid dead-ends

<table>
<thead>
<tr>
<th>Selective Primary Control</th>
<th>Selective Secondary Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>- invest effort, ability and time</td>
<td>- enhance goal value</td>
</tr>
<tr>
<td>- learn new skills</td>
<td>- devalue competing goals</td>
</tr>
<tr>
<td>- fight difficulties</td>
<td>- enhance perception of control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compensatory Primary Control</th>
<th>Compensatory Secondary Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>- recruit others' help and advice</td>
<td>- goal disengagement (sour grapes)</td>
</tr>
<tr>
<td>- use of technical aids</td>
<td>- self-protective attributions</td>
</tr>
<tr>
<td>- employ unusual means</td>
<td>- self-protective social and intra-</td>
</tr>
<tr>
<td>- take a detour</td>
<td>individual comparisons</td>
</tr>
</tbody>
</table>
Figure Captions

Figure 1. Hypothetical life-span trajectories of primary control, secondary control, and need for primary control

Figure 2. The extended model of action phases: Rubicon and deadline
Availability/Use of Control

Life-span Timing in Years

Primary Control

Secondary Control

Need for Primary Control

Birth

Death

Life-span Timing in Years