

Adolescents' and Parents' Developmental Regulation During the Transition From School To Higher Education

DISSERTATION

zur Erlangung des akademischen Grades
einer Doktorin der Philosophie (Dr. Phil.)

der
Erziehungswissenschaftlichen Fakultät
der Universität Erfurt

vorgelegt von
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Erfurt, 2010

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urn:nbn:de:gbv:547-201100015

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Summary

This thesis focuses on the role of parents for adolescents' development at career transitions within a framework of developmental regulation. In this framework, I assumed that adolescents' career-related activities are complemented by career-specific parental activities. Two main objectives guided my work: First, this thesis aimed at investigating the associations between career-related developmental regulation of adolescents and parents. Second, this thesis asked for the potential benefits of developmental regulation of both adolescents and parents. I integrated several lines of theory concerning adolescents' developmental regulation (referred to as self-regulation) as well as parents' regulation (referred to as other-regulation, Sameroff, 2010) to derive the research questions.

Individuals face various career-related transitions during adolescence that channel their development in many ways (Nurmi, 2004; Salmela-Aro, 2009). These transitions take place within the educational system, e.g., a transition from one school form to another, or concern the entrance into the labor market, e.g., a transition from school to vocational training. Individual initiative is required to successfully master career transitions in adolescence (Nurmi, 2004; Heckhausen, Wrosch, & Schulz, 2010; Savickas, 2005). Previous theory and research on adolescents' developmental regulation have concentrated on what can be called phase-adequate engagement. Phase-adequate engagement encompasses behaviors which are undertaken by an adolescent to accomplish developmental goals related to an upcoming transition (e.g., Kracke & Heckhausen, 2008). Such goals can have different content, but have in common their focus on the transition. Appropriate developmental goals are thus in accordance with age-graded norms and standards (Nurmi, 2001; 2004). Previous research also demonstrated that phase-adequate engagement is beneficial for adolescents. For instance, they are more likely to get an apprenticeship when they actively engage in writing applications (Nagy, Köller, & Heckhausen, 2005). Moreover, youths who are actively engaged are more satisfied with the choices they make (Schindler & Tomasik, 2010), and show higher positive affect after high school graduation (Haase, Heckhausen, & Köller, 2008) than those who are not engaged.

Despite the importance of individual initiative for the successful mastery of career transitions, developmental psychologists have repeatedly stressed the fact that this initiative is embedded in a social context, i.e., the relationships with other people, and is bound to societal and institutional constraints (e.g., Silbereisen, Eyferth, & Rudinger, 1986; Vondracek, Lerner, & Schulenberg, 1986). In adolescence, parents are highly influential in youths' decisions about their future career (e.g., Youniss & Smollar, 1985). However, parents' role for adolescents' phase-adequate engagement has so far only been explored

in a way that yields very broad conclusions. For example, there is increasing evidence which shows that having good relations to parents (in terms of, for example, a warm relationship and few conflicts) is correlated with several indicators of adolescents' career development (Whiston & Keller, 2004). However, theoretical conceptualizations of and empirical research on the actual processes through which parents influence adolescents are rather rare. The present thesis sets out to fill this gap.

Since phase-adequate engagement comprises various behaviors, I focused on one aspect of it which has received a lot of attention in the literature: career exploration. Exploration encompasses the process of seeking and processing information, and of comparing alternatives, which informs an individual's choices about future career (e.g., Patton & Porfeli, 2007). With regard to parents' other-regulation in the domain of career, no systematic work has been carried out so far. I thus worked out a conceptualization and operationalization of parents' career-specific behaviors.

I sought to answer five research questions with multiple studies and with data gathered in different ways. On the one hand, I collected data on two time levels: the macro-level (from year to year) and the micro-level of development (from week to week, cf. Lichtwarck-Aschoff, Kunnen, & van Geert, 2008). On the other hand, I gathered data from adolescents as well as from their mothers and fathers. I conducted five empirical studies, based on four different data sets to tackle the five research questions outlined below. Three data sets pertained the macro-level of development with adolescents facing high school graduation. Furthermore, I conducted a diary study with weekly assessments during the application process to university, which is a new approach in the domain of adolescent career development. The main results can be summarized as follows according to the five research questions.

First, how do actual processes of phase-adequate engagement look like at the transition to college? This question was tackled on a week to week level. The results point to a lot of variability both between youths and within individuals. On the one hand, the results revealed inter-individual differences in how adolescents made a choice concerning their college major which corresponded with the amount of exploration they engaged in. On the other hand, the results showed that exploration is a highly fluctuating behavior which changed from week to week.

Second, given the objective to study parental other-regulation, how is parental career-related-involvement best to be conceptualized? I developed and validated a questionnaire instrument to capture parental other-regulation. This instrument comprised three facets of parents' career-specific involvement: support, interference, and lack of engagement.

Third, how are adolescents' phase-adequate engagement and parents' involvement associated? Taken together, the results of the different studies conducted revealed that parents' support related positively to adolescents' exploration. Moreover, the role of interference was dependent on the type of exploration studied, and on the level of analysis (macro- vs. micro-level). Interference, and to some extent lack of engagement, were positively related to decision-problems in youths.

Fourth, do the intensities of and the associations between adolescents' and parents' developmental regulation depend on temporal and process characteristics related to a transition? Empirical support was found for the assumption that adolescents' exploration would be affected by process features of a transition. Parents' involvement was adapted to the situation of the adolescent and was also affected by process characteristics.

Fifth, what is the payoff of adolescents' phase-adequate engagement for process satisfaction while making the transition from school to college and for later adjustment to college? Are there such benefits of parents' career-related involvement as well? The results of the diary study showed that both youths' exploration and parents' support contributed to higher process satisfaction during the transition to college. Moreover, the results revealed that forming a strong commitment to one college major option, combined with higher levels of exploration, was associated with better adjustment later in college.

In sum, the development of appropriate measures made it possible to test theoretical assumptions concerning adolescents' and parents' developmental regulation at the macro- and the micro-level of development. The empirical results further provide a basis for future research that focuses on possible mechanisms of self- and other-regulation. This thesis concludes with suggestions for future studies rooted in a dynamic view of development (van Geert & Steenbeck, 2005).

Part I. General Introduction

Introduction

Graduation from high school and the transition to college or vocational training is one of the major challenges in adolescence (Seiffge-Krenke & Gelhaar, 2006), particularly because youths are confronted with a vast array of possible choices (Galotti, 1999; Schwartz, Cote, & Arnett, 2005). When approaching high school graduation, adolescents' imminent developmental task is to screen possible options for their future career and make a decision about their next career step.

It is widely acknowledged that the way how individuals cope with developmental tasks or challenges depends on individual and situation-specific characteristics and their interaction (e.g., Brandstädter, 2006; Heckhausen, Wrosch, & Schulz, 2010; Nurmi, 2004; Salmela-Aro & Schoon, 2009). Another point of common scholarly consensus concerns the notion of development as action in context (e.g., Silbereisen, Eyferth, & Rudinger, 1986; Vondracek, Lerner, & Schulenberg, 1986). According to this position, adolescents cope with the developmental task of making an occupational choice not only depending on their individual capacities, but their behavior is intertwined with the activities of others in their social context and bound to societal and institutional constraints.

The present thesis examines adolescents' engagement in the developmental domain of career following the concept of development as action in context (Silbereisen et al., 1986). For this reason, this thesis focuses on the role of parents' engagement regarding their children's career development and its interaction with the adolescents. The past research has mostly focused on the decision of the adolescent alone, while according to the above proposition, the focus must also be on the parents. Briefly said, the main research questions concern those of (a) how adolescent and parent engagement interact, and (b) whether there are benefits of such engagement. In order to tackle these question appropriately, an integration of several theories is warranted as a basis for empirically testable hypotheses. The structure of this introductory chapter is as follows. First, models that are useful in describing adolescents' developmental regulation of the career task are outlined. Second, these theories are complemented by models of parent-adolescent co-development (Nurmi, 2004) and adolescent and parent self- and other-regulation (Sameroff, 2010). The final section of this chapter outlines the research questions and explains the rationale for the empirical studies.

Adolescents' Developmental Regulation

Several lines of theory are useful to describe developmental regulation when adolescents face career transitions. Developmental regulation encompasses those goal-directed behaviors which are undertaken by an individual to accomplish developmental goals (e.g., Kracke & Heckhausen, 2008). Such goals are related to age-graded norms, challenges, and transitions (e.g., Nurmi, 2004). I will first outline and then integrate relevant models

from three fields of psychology: developmental theories of motivation, identity theories, and career theories.

Developmental Theories of Motivation

Heckhausen and colleagues' motivational theory of life-span development. Heckhausen, Wrosch, and Schulz (2010) described action cycles of setting, striving for, and disengagement from developmental goals which recur throughout an individual's life, in their motivational theory of life-span development. The authors described developmental goals as the internal representation of developmental tasks. These developmental tasks are bound to normative transitions, such as graduating from high school or having a child. Heckhausen et al. further assumed that individuals who set and strive for developmental goals which are in accordance with current developmental tasks maximize the chances of goal attainment. If individuals fail to engage in phase-adequate behaviors, they miss the point of highest probability to attain a developmental goal. For example, the chances for getting an apprenticeship in Germany are highest during the final school year. Youths who fail to get an apprenticeship before they graduate from high school have to deal with rapidly decreasing chances to manage the transition to vocational training successfully any time (Heinz, 2000).

The three action phases—goal setting, goal striving, and goal disengagement—are separated by two transitions: (1) The formation of an intention brings the individual from a state of deliberating about possibilities to a volitional state of pursuing the set goal (see Gollwitzer, 1990); (2) The developmental deadline characterizes the point of rapidly decreasing chances for goal attainment. The closer an individual gets to the deadline, the more he or she perceives the imminent loss of opportunities, and the more intense becomes his or her striving to achieve the developmental goal. According to Heckhausen and colleagues (2010), the goal striving phase can thus be divided into a non-urgent and an urgent phase which influence the strategies people use.

For each phase in the cycle of goal setting, goal striving, and goal disengagement adaptive and maladaptive strategies exist. Heckhausen et al. distinguished three strategies of goal engagement and two strategies of goal disengagement. When engaging in goal pursuit, individuals can invest their energy, time, and resources to accomplish the developmental goal (selective primary control). They can also increase their commitment to the chosen option through volitional strategies, such as imagining positive consequences of goal attainment (selective secondary control). Moreover, they can involve external resources, such as help from others (compensatory secondary control). When a developmental deadline is passed, goal disengagement becomes important. This involves that individuals start to distance themselves from the goal, for example through decreasing its importance and increasing the importance of other goals. They can also employ self-defensive strategies, such as self-serving attributions and downward social comparisons. Heckhausen et al. argued that during the goal striving phase individuals increasingly use

external resources with growing urgency, whereas the other goal engagement strategies are used throughout the entire goal striving phase.

Nurmi's life-span model of motivation: Socialization and self-development. Nurmi (2004) described self-development in adolescence in terms of four processes: channeling, selection, adjustment, and reflection. First, the environments in which individuals grow up set age-graded norms and standards that structure adolescents' development (channeling). This notion, again, reflects the idea that adolescent action is bound to developmental tasks and transitions which is similar to Heckhausen's model. Second, like many contemporary developmental psychologists (e.g., Brandstädter, 2006; Lerner, 1983) Nurmi asserted that youths are actively producing their development (selection). Adolescents do so by means of setting and pursuing personal goals in accordance with current developmental tasks, by employing strategies of planning, decision-making, and problem-solving, as well as by exploring identity-relevant information and committing themselves to a future life path. Third, adolescents do not always accomplish all their goals but sometimes face difficulties during goal striving. Hence, they have to adjust their goals and strategies to the new situation (adjustment). This involves employment of coping strategies and self-serving attribution strategies, and the reconstruction of their goals. Fourth, after youths received feedback about the outcomes of their engagement, or when they find themselves in a certain life situation, they integrate the experiences and new information into their self-concept (reflection). Nurmi assumed that adolescents who construct and pursue personal goals in accordance with current developmental tasks are adaptive producers of their development. That pays off, for example, in attainment of developmental goals as well as in higher levels of well-being. In addition, the author proposed that self-development is not solely an individual process, but is embedded in adolescents' relationships to their parents, peers, and teachers. The processes of co-development will be described in a subsequent section of this chapter.

Theories of Identity Development

Identity statuses and styles. In the identity status model, Marcia (1966) described commitment and exploration as the building blocks of identity formation in adolescence. Within the domain of occupation, commitment refers to making choices about future career and engaging in implementation of these choices, exploration encompasses the process of seeking and processing information, and of comparing alternatives, which informs an individual's commitments. Marcia distinguished four identity statuses as combinations of different levels of exploration and commitment. Adolescents with an achieved identity are high on both exploration and commitment. Adolescents who are currently exploring but have not yet made commitments are in the moratorium status, while having made a commitment without having explored is labeled foreclosed status. Adolescents who neither explore nor have made commitments are in the diffused status.

Acknowledging the fact that Marcia's model is merely outcome-oriented, Berzonsky (1992) elaborated on a model which focuses more on the processes of identity formation. The author suggested identity styles to describe the social-cognitive strategies adolescents employ in dealing with identity issues. Identity styles describe individual differences in the processing of identity-relevant information. Youths with an information-oriented style actively explore and evaluate information before they commit to any option, while youths with a normative style form strong and stable commitments based on the normative expectations of significant others. Youths with a diffused style tend to avoid identity decisions as long as possible.

Luyckx and colleagues' dual-cycle model of identity development. Marcia's theory has recently been refined in the dual cycle model of identity formation by Luyckx, Goosens, and Soenens (2006). The authors integrated Marcia's classical paradigm with more recent views on identity formation which argue that individuals continuously reconsider the identity choices they have made (Crocetti, Rubini, & Meeus, 2008; Meeus, Iedema, & Maassen, 2002). Luyckx et al.'s two cycles consist of exploration in-breadth and commitment making on the one hand (commitment formation; Marcia's paradigm) and exploration in-depth and identification with commitments on the other hand (commitment evaluation). Before commitments are made, individuals explore in-breadth in order to look at and compare possible alternatives. After they are committed, individuals explore in-depth which serves the strengthening or re-evaluation of existing commitments. Identity development is hence defined as an iterative process of feedback loops and reciprocal cycles that influence each other (Luyckx et al., 2006).

Career Development Theory: Savickas' Career Construction Theory

In career construction theory, Savickas (2002, 2005) built on and extended the seminal work of Super (1957, 1980). The author described the processes through which individuals make meaning of their vocational behavior and occupational experiences. These processes entail the development and implementation of an individual's vocational self-concept. Similar to Heckhausen et al. (2010) and Nurmi (2004), Savickas (2005) argued that institutions structure the life course of an individual, and career construction processes are triggered by vocational developmental tasks and transitions. The readiness and resources for the successful mastery of current and anticipated career tasks are subsumed under the concept of career adaptability. Career adaptability consists of four facets: first, becoming aware of upcoming developmental tasks and establishing a sense of future orientation (career concern); second, actively and autonomously making decisions (career control); third, exploring the self and the world of work as well as the fit between both (career curiosity), and fourth, establishing self-efficacy and self-esteem regarding the mastery of career tasks (career confidence).

In line with a long history in career development research going back to Super's early

theorizing (1957), Savickas (2002) asserted that during adolescence exploration is the chief coping behavior for the mastery of current career tasks. In adolescence, there are three consecutive vocational tasks that go along with different kinds of exploration (see Gati & Asher, 2001, for a similar idea): (1) During the crystallization of one's self-concept in-breadth, exploration is important to gain tentative ideas about how one could fit to the work role. (2) During specification of occupational choice in-depth, exploration is important for comparisons of alternatives and the declaration of a vocational choice. (3) During actualization, individuals take concrete actions in order to implement their choice.

Synthesis: Adolescents' Developmental Regulation at Career Transitions

When taking a holistic view on adolescents' developmental regulation, an integration of several conceptualizations is useful (Kracke & Heckhausen, 2008; Nurmi, 2004). In some instances, previous research has already established ties between the lines of theory described above. For example, several theorists assumed linkages between the development of intentional self-regulation and identity (e.g., Brandstädter, 2006; Gestsdottir & Lerner, 2008; Schwartz et al., 2005). For instance, individuals need the ability to form abstract representations of the self (i.e., identity representations) in order to set and pursue developmental goals (Brandstädter, 2006). Moreover, exploration and commitment have been framed as means for agentic self-development (e.g., Kracke & Heckhausen, 2008; Nurmi, 2001, 2004) involving the development of one's self-concepts (Savickas, 2005).

With regard to adolescents' developmental regulation at career transitions the described and other models of motivation (e.g., Salmela-Aro, 2009), identity (e.g., Grotevant, 1987; Kunnen & Bosma, 2000; Schwartz et al., 2005), and career development (e.g., Flum & Blustein, 2000; Gati & Asher, 2001; Germeijs & Verschueren, 2007; Hirschi & Läge, 2007) share several commonalities which can be integrated into a comprehensive perspective. This perspective can be summarized in three main propositions.

1. Age-graded career developmental tasks and transitions trigger adolescents' intentional efforts towards accomplishment of these tasks (Heckhausen et al., 2010; Nurmi, 2004; Salmela-Aro, 2009), prompt identity development (Grotevant, 1987; Kunnen & Bosma, 2000), and stimulate vocational behavior (Kracke & Schmidt-Rodermund, 2001; Savickas, 2005).
2. Adolescents' behavior which is directed at the current task—be it through setting and pursuing goals, exploring occupational options, or committing oneself to one of the explored options (Nurmi, 2004)—can be considered phase-adequate engagement (Savickas, 2005). Phase-adequate engagement of either type serves the accomplishment of developmental goals (Heckhausen et al., 2010) related to the upcoming transition or career task.

3. Phase-adequate engagement is beneficial for adolescents. It can pay off in terms of attainment of one's career-related goals, well-being, and satisfaction with a chosen career option (Gati & Asher, 2001; Germeijs & Verschueren, 2007; Heckhausen et al., 2010; Nurmi, 2004; Salmela-Aro, 2009; Savickas, 2005).

A growing body of empirical evidence supports the above assumptions. This evidence suggests that phase-adequate engagement, in terms of transition-related goal engagement, career exploration and commitment, is particularly pronounced and even increases when youths approach educational and career transitions (e.g., Chang, Chen, Greenberger, Dooley, & Heckhausen, 2006; Germeijs & Verschueren, 2006; Haase, Heckhausen, & Köller, 2008; Kalakoski & Nurmi, 1996). Furthermore, higher levels of these kinds of engagement have positive consequences for choice implementation and well-being (e.g., Dietrich, Jokisaari, & Nurmi, 2009; Germeijs & Verschueren, 2007; Grotevant, Cooper, & Kramer, 1986; Haase et al., 2008; Kracke & Schmitt-Rodermund, 2001; Nagy, Köller, & Heckhausen, 2005; Nurmi, Salmela-Aro, & Koivisto, 2002; Schindler & Tomasik, 2010; Vasalampi, Nurmi, & Salmela-Aro, 2009).

Adolescent Self- and Parental Other-Regulation

The focus of previous research, such as the studies cited in the previous section, has been mainly on adolescents' engagement and its outcomes. However, little is known about how this engagement is complemented and affected by the behavior of significant other persons (cf. Heckhausen et al., 2010). In adolescence, parents are the most influential persons for youths' decisions about their future career path (e.g., Fend, 1991; Mortimer, Zimmer-Gembeck, Holmes, & Shanahan, 2002; Tynkkynen, Nurmi, & Salmela-Aro, 2010; Youniss & Smollar, 1985). An increasing body of literature demonstrates that the relations to parents seem influential for adolescents' developmental regulation in general and regulation of career tasks in particular (see, for overviews, Massey, Gebhardt, & Garnefski, 2008; Whiston & Keller, 2004).

In spite of this conclusion, theoretical conceptualizations of and empirical research on the actual processes through which parents influence adolescents are rather rare. Knowledge about processes and mechanisms entails an in-depth understanding of how development comes about (e.g., Lavelli, Pantoja, Hsu, Messinger, & Fogel, 2005; Lichtwarck-Aschoff, Kunnen, & van Geert, 2008). Moreover, knowledge about processes provides a basis for targeted theory-based interventions (Perels, Gürtler, & Schmitz, 2005).

The present thesis sets out to theoretically advance the understanding of the processes of parents' role in adolescents' regulation of the career task. This contribution to the theoretical discussion will be based on general theorizing on self- and other-regulation (Sameroff, 2010), co-development (Nurmi, 2004), and joint projects (Young et al., 2001). The next section gives an overview on these models.

Theories on Self- and Other-Regulation and Co-Development

Sameroff's model on self- and other-regulation. Sameroff (2010) asserted that self-regulation is always action within social contexts¹. This entails that the social contexts too engage actively in regulatory activities, which the author calls other-regulation. Other-regulation can be exerted by parents, peers, caregivers, teachers, or other people in an adolescents' social context. A bidirectional relationship exists between adolescent self-regulation and the regulation through others. Sameroff assumed that the self-regulation capabilities of an adolescent depend largely on the other-regulation he or she has experienced. Further, the author proposed that the regulation activities of others, particularly parents and other adults, are adapted to the developmental stage or situation of the adolescent in a transactional process. This transactional process is conceptually similar to Vygotski's (1978) zone of proximal development. According to Sameroff's (2010) model, it can be assumed that over the course of adolescence youths become more and more able to self-regulate their actions. Thus, the challenges they cope with alone become increasingly complex, and at the same time other-regulation becomes less important.

Nurmi: Self-development and co-development. Nurmi (2001; 2004) elaborated on adolescents' self-development as being embedded in the relationships to others, such as parents. The author labeled the bidirectional relationships between adolescents' and others' behaviors as co-development. Parent-adolescent co-development thus encompasses two directions of influence. First, parents can influence their children in three ways: (1) Parents set and communicate standards for development; (2) parents are tutors and role models for the mastery of developmental tasks, and (3) they are a source of feedback and support. Second, youths can influence their parents in two ways: (1) The adolescents' competencies for mastering tasks elicit certain parental behavior; (2) the adolescents' behaviors induce stress in their parents which, in turn, influences their thoughts, behavior, and well-being.

Young and colleagues' joint action projects. Based on action theory (e.g., Gollwitzer & Bargh, 1996), Young and colleagues (2001; 2008) conceptualized adolescent-parent interactions as joint projects. The authors extended previous goal theory (e.g., Little, 1983) by a relational component. A joint career project encompasses a series of goal directed and intentional actions undertaken by both the adolescents and their parents. It is jointly constructed and pursued within mutual interactions. The joint project is part of the adolescents' and parents' goal hierarchy. For parents, the joint project pertains to

¹Sameroff's (2010) original model addresses self-regulation in children. In contrast to self-regulation as goal-directed behavior towards a given standard or desired state (see Baumeister & Vohs, 2007), self-regulation in infancy and childhood is related to sleep, attention, or emotions (Sameroff, 2010). Here, self-regulation refers to adolescents' developmental regulation as defined earlier in this chapter.

their 'parenting project' (McAdams, Hart, & Maruna, 1998), for adolescents, it pertains to their 'growing-up/identity project' (Cantor & Sanderson, 1998).

Synthesis: Parent-Adolescent Co-Development Related to Career

The referred models can be put together in few propositions. Within my framework for this thesis, I propose other-regulation through parents to be one process which is part of co-development.

1. Parents' activities of other-regulation are adapted to the situation of the adolescent (Sameroff, 2010). Their regulation is influenced by the same institutional and temporal constraints as adolescents' developmental regulation is (Nurmi, 2001).
2. Co-development essentially means bidirectional influences (Sameroff, 2010; Nurmi, 2004; Young et al., 2001). Parents influence adolescents, but also do adolescents influence their parents (Kuczynski, 2003).
3. Processes of co-development are embedded in the relationship and the goal systems of each actor (Young et al., 2001).

However, Young and colleagues' (2001) assumption that generally career goals and projects are shared by adolescents and parents seems unrealistic. It has been found that adolescents and parents do not always share their (developmental) goals or even have diverging goals (Chang, Heckhausen, Greenberger, & Chen, in press; Meegan & Berg, 2001). For instance, the parents of an adolescent in the final year of high school might anticipate the need to think about career choice. Their child, however, might place more importance on friendships and leisure, and thus might not share the developmental goal related to the upcoming transition. Another reason could be that an adolescent might not want to share her developmental goals and plans with her parents because parents too often showed controlling behaviors in the past, and the adolescent wants to make independent decisions.

The previous example makes clear, that a focus on parents' domain-specific behaviors is crucial when investigating self- and other-regulation in a developmental fashion. Domain-specific behaviors have been described as parenting practices (e.g., Darling & Steinberg, 1993; Pomerantz & Eaton, 2001) or involvement (Pomerantz, Moorman, & Litwack, 2007). Practices are undertaken with respect to the particular goals in specific contexts and situations (Pomerantz & Eaton, 2001). For example, parents may want to support their child in making a career choice through offering feedback on the child's strengths and weaknesses, thus offering them an opportunity for career exploration. Parenting practices differ from aggregated views of parents' behaviors and the parent-adolescent relationship over a range of situations and developmental domains, such as parenting styles (e.g., Darling & Steinberg, 1993) and attachment (e.g., Bowlby,

1969). In contrast to parent-adolescent relations and parenting styles in general, specific career-related parental practices may be elicited or affected by the adolescents' own developmental regulation (cf. Pomerantz & Eaton, 2001).

When focusing on the role of parental behaviors for the developmental domain of career choice, little is known empirically about parents' specific behaviors. The vast majority of studies have addressed general aspects of parent-adolescent relationship, such as attachment (Blustein, Walbridge, Friedlander, & Palladino, 1991), parenting styles (Tracey, Lent, Brown, Soresi, & Nota, 2006), and family climate and family dysfunction (Hargrove, Inman, & Crane, 2005; Ryan, Solberg, & Brown, 1996). However, this research strategy does not allow to detect processes of co-development—adolescents' self-regulation being complemented by parents' other-regulation (Sameroff, 2010)—since no specific regulation behaviors of parents were examined.

In order to understand the transactional process underlying career choice of adolescents a theoretical conceptualization and operationalization of parents' career-specific behaviors or practices is needed. This conceptualization should incorporate the propositions summarized in the beginning of this section. Even though Young and colleagues (2001) already started to explore the mechanisms of self- and other-regulation in the career domain, they did not elaborate systematically on parents' behaviors. To fill this gap is one major aim of the present thesis.

Research Questions

Following from the discussion above, there are two major objectives of the present thesis: First, this thesis aims at investigating the associations between career-related developmental regulation of adolescents and parents. Second, this thesis asks for the potential benefits of developmental regulation of both adolescents and parents.

This thesis focuses on the transition from school to higher education as one major career transition in adolescence². The models of developmental regulation imply that focusing on career transitions in youths' lives is a promising approach for addressing the objectives above (see also developmental theories based on the dynamic systems idea, e.g., Granic & Patterson, 2006; Kunnen & Bosma, 2000). A transition has the potential

²There are two possible major career-related transitions for German adolescents. Which transition they make depends on the type of secondary school they attend. Depending on the state, German students pass from primary to secondary school after grade 4, 5, or 6. In Thuringia, where the present studies were conducted, from grade 5 on children follow one of the two educational tracks: Gymnasium (upper track) or Regelschule (lower track). Students who attend lower track schools typically make a transition to vocational training (i.e., apprenticeship) after grade 9 or 10 when they are 15-16 years old (Heinz, 2000). Few of these students continue their education at higher track schools. Students of upper track schools graduate after grade 12 or 13 when they are 18-19 years old. The majority of them make a transition to college, and a minority makes a transition to vocational training (Federal Ministry of Education and Research, 2007).

to trigger adolescents' and parents' developmental regulation. Further, possible benefits of phase-adequate engagement can be assessed during and after the transition.

Moreover, the literature review showed that there are various facets of phase-adequate engagement at career transitions. This thesis focuses principally on one kind of engagement—career exploration behaviors—although other kinds are also tackled. Exploration behaviors have gained much attention in the identity literature (e.g., Grotevant, 1987; Luyckx et al., 2006; Marcia, 1966) as well as in the career literature (e.g., Jordaan, 1963; Patton & Porfeli, 2007; Savickas, 2005; Super, 1980; Taveira & Moreno, 2003). However, there is little research which focused on exploration at career transitions and addressed its possible benefits for coping with these transitions (see Germeijs & Verschueren, 2007). Moreover, to date, situation-specific variations of exploration during transitions remained unexplored. Hence, the investigation of exploration processes is a common feature of all studies in this thesis. In addition, processes of choosing and committing to a college major as well as processes of pursuing transition-related personal goals are examined.

Parents' other-regulation will be mainly focused on in terms of which practices they employ concerning their children's career development. In addition, a minor research question will deal with the role of parents' transition-related beliefs for parent-adolescent co-development³.

To detail the two broad objectives stated earlier, I provide here a list of the main research questions of this thesis⁴.

1. How do actual processes of phase-adequate engagement look like at the transition to college?
2. Given the objective to study parental other-regulation, how is parental career-related involvement best to be conceptualized?
3. How are adolescents' phase-adequate engagement and parents' involvement associated?
4. Do the intensities of and the associations between adolescents' and parents' developmental regulation depend on temporal and process characteristics related to a transition?
5. What is the payoff of adolescents' phase-adequate engagement for (a) process satisfaction while making the transition from school to college and (b) for later adjustment to college? Are there such benefits of parents' career-related involvement as well?

³Since the role of transition-related beliefs is only briefly touched in this thesis, it is not introduced here.

Details on the theoretical background regarding parental beliefs are provided in Part II, Chapter 4.

⁴The exact deduction of hypotheses is provided in the chapters of Part II.

Methodological Approaches in This Thesis

The issue of adolescent and parent developmental regulation is addressed in this thesis with different research designs and methodologies. Below I elaborate on some important design issues that guided the planning of the empirical studies.

Gathering Macro-Level and Micro-Level Data

Apart from the macro-micro distinction, an important feature of the studies in this thesis lies in their multi-informant nature. Previous investigations focusing on family members' ratings of adolescent or parent behaviors usually revealed low to moderate correlations between adolescents and their parents (e.g., Jaccard, Dittus, & Gordon, 1998; Jacob & Windle, 1999; Manders, Janssens, Cook, Oud, Debruyne, & Scholte, 2009; Pelegrina, Garcia-Linares, & Casanova, 2003). This has two implications: First, there is a common reality which accounts for shared variance. Second, there are unique effects of the perceiver that account for perceptual differences. These conclusions are reflected in several theories from different areas of psychology—from social psychology (cf. Bodenhausen, Macrae, & Hugenberg, 2003) to personality psychology (cf. Pincus & Ansell, 2003).

The multi-informant approach hence is useful to answer questions about the associations of adolescent and parental regulation, such as: Which kind of adolescent behavior elicits which kind of parent behavior? Using solely the perceptions of adolescents, for example, yields only a limited amount of information on how parents react, and to what parents react (i.e., the youth's actual behavior vs. parents' perception of it). It has been argued repeatedly that adolescents' interpretations of parents' behaviors are more important for their development than parents' actual behaviors (Schaefer, 1965; Steinberg, Lamborn, Dornbusch, & Darling, 1992; Lamborn, Mounts, Steinberg, & Dornbusch, 1991). The same argument, however, can be applied to parents. This makes clear that a focus on bidirectional relationships implies gathering multi-informant data. To disentangle within-individual effects from cross-rater associations we collected data from every involved family member in studies 2 and 3. Whereas within-rater associations display rather subjective views on the assumed process, cross-rater associations provide stronger evidence for mutual influences because they are less likely caused by method covariance (Kenny & Berman, 1980).

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Overview About This Thesis

The papers in this thesis are based on several cross-sectional and longitudinal datasets collected during the years 2006-2010. Study 1 was conducted to develop and validate a questionnaire instrument on parents' career-specific regulation behaviors—the parental career-related behavior (PCB) scales. Studies 2 and 3 explore associations between adolescents' and parents' developmental regulation with multi-informant data on the developmental macro-level. Study 2 was conducted as a pilot study with youths and their mothers, in which the parent version of the PCB as well as a new measure of career exploration (Kracke & Dietrich, 2008) were tested. Study 3 focuses on process characteristics as moderators of adolescents' exploration and parents' career-related behaviors. Study 4 moves on to the micro-level of development. It is based on diary data collected from youths who went through the transition from high school to college. It investigates situation-specific variation in adolescent exploration and parental career-related involvement as well as associations between regulation by youths and parents. It furthermore examines whether exploration and parent involvement contribute to youths' satisfaction with the progress of the transition. Finally, study 5 examines developmental trajectories of how adolescents make their college major choice, how they explore transition-related

Table 1. Overview About Datasets and Studies Described in Part II of This Thesis

	Study		
	1	2, 3	4, 5
Timing	In secondary school	A few months before graduation from high school	During the application process to college, and at the end of the first semester in college
Sample	N = 351 adolescents aged 15-18 years	N = 38 adolescents and their mothers (study 2); N > 175 adolescents aged 18-19 years and their mothers and fathers (study 3)	N ≤ 33 adolescents aged 18-19 years
Design	Cross-sectional questionnaires	Cross-sectional and longitudinal questionnaires	Standardized weekly diaries and follow-up assessment
Method	Paper-pencil assessment	Paper-pencil assessment	Internet-based assessment

Note. The participants of the diary study (studies 4 and 5) were recruited from the sample of study 3.

information, and whether youths' engagement during the transition pays off later in terms of better college adjustment.

Part II of this thesis contains the empirical studies. Table 1 gives an overview about the studies as well as the datasets on which analyses are based. Part III integrates the research findings of the studies 1 to 5 and discusses their relevance with respect to the lines of theory outlined in this chapter. Finally, implications for future theory and research on adolescents' and parents' developmental regulation are given.

Part II. Empirical Studies

Study 1. Career-Specific Parental Behaviors in Adolescents' Development

Dietrich, J. & Kracke, B. (2009). Career-specific parental behaviors in adolescents' development. *Journal of Vocational Behavior*, 75, 109-119.

Abstract

Parents are major partners in helping adolescents prepare for a career choice. Although several studies have examined links between general aspects of the parent–adolescent relationship and adolescents' career development, little research has addressed the mechanisms involved. This study aimed to validate a three-dimensional instrument for the assessment of parental career-related behaviors and to examine their associations with career exploration and decision-making difficulties. After testing the dimensional structure of the instrument, we examined the relationship between parents' behaviors and adolescents' career development by using data from 359 German adolescents who reported the amount of perceived parental career-related behaviors and their career exploration and decision-making difficulties. The results of structural equation modeling confirmed the hypothesized dimensional structure (support, interference, lack of engagement). While parental support associated positively with career exploration, interference and lack of engagement associated with decision-making difficulties. Furthermore, interference and lack of engagement moderated the relationship between support and exploration. Support moderated the association between interference and decision-making difficulties.

Introduction

Previous research has shown that adolescents speak most frequently about career issues with their parents (Fend, 1991; Otto, 2000) and name parents as being a major influence during educational and career transitions (Mortimer, Zimmer-Gembeck, Holmes, & Shanahan, 2002; Tynkkynen, Nurmi, & Salmela-Aro, 2010), underlining parents' importance in choosing a vocation. Previous research in the field has had several limitations. For example, most studies that examined parental influences in adolescents' career development have relied on measures of parent–adolescent relationship such as parenting style or attachment. It is difficult to deduce implications for interventions and counseling from the broad results these studies yield. Moreover, the majority of the results are based on cross-sectional designs. Although these designs do not allow for conclusions in favor of parental influence, often an influence from parents to adolescents was assumed. Furthermore, only linear effects of parents' behaviors have been examined. No combined (interaction) effects of behavior facets have been studied. Consequently, this study dealt with parents' behaviors which specifically address the career development of their adolescent offspring.

The aims of this study were, first, to develop a questionnaire about parental career-related behaviors for use in survey research; second, to probe its validity; and third, to examine associations with aspects of adolescents' career development. Three facets of parents' career-related behaviors were derived mainly from previous qualitative research (e.g., Kracke & Noack, 2005; Oechsle, Maschetzke, Rosowski, & Knauf, 2002; Young et al., 2001): support, interference, and lack of engagement. Furthermore, the relations between these parental behaviors and two crucial aspects of adolescents' career development, i.e., career exploration and decision-making difficulties, were examined.

Quality of the Parent–Adolescent Relations and Career Development

Exploration, self-efficacy, vocational identity, and decision-making difficulties are central aspects in adolescents' career development. They have been studied frequently as being influenced by the quality of the parent–adolescent relationship. Super (1980) acknowledged career exploration as being a crucial adaptive behavior during adolescence by characterizing the adolescent period as the exploration stage. Planful exploration is widely approved as a means for gathering appropriate knowledge about the self and the world of work (Patton & Creed, 2007; Porfeli, 2008). Self-efficacy has attained particular attention in social cognitive career theory (Lent, Brown, & Hackett, 2002). On the one hand, it has been examined as the extent to what adolescents anticipate success in certain fields of study or jobs. On the other hand, self-efficacy has been studied in relation to career choice itself, and is defined as the belief in one's ability to successfully undertake actions in order to make an occupational decision (Betz & Hackett, 2006). In career construction theory (Savickas, 2005), this latter behavior is referred to as career

confidence. Career decision-making difficulties have been described as a correlate as well as another indicator of career adaptability (Patton & Creed, 2007; Savickas, 2005).

When focusing on the role of parental behaviors for adolescents' career development, the vast majority of studies have addressed general aspects of parent–adolescent relationship, such as attachment (Blustein, Walbridge, Friedlander, & Palladino, 1991), individuation (Grotevant & Cooper, 1988), parenting styles (Tracey, Lent, Brown, Soresi, & Nota, 2006), and family climate and family dysfunction (Hargrove, Inman, & Crane, 2005; Ryan, Solberg, & Brown, 1996). Results of these studies have shown that a secure attachment style, individuation in the parent–adolescent relationship, and authoritative parenting were linked to more career exploration activities (Grotevant & Cooper, 1988; Kracke, 1997; Vignoli, Croity-Belz, Chapeland, de Phillipis, & Garcia, 2005), higher career self-efficacy (Guay, Senecal, Gauthier, & Fernet, 2003; Lim & Loo, 2003; O'Brien, Friedman, Tipton, & Linn, 2000; Ryan et al., 1996), and earlier development of vocational identity (Johnson, Buboltz, & Nichols, 1999; Penick & Jepsen, 1992; Tracey et al., 2006). Family conflict and dysfunction, however, associated negatively with career self-efficacy and vocational identity development (Hargrove, Creagh, & Burgess, 2002; Johnson et al., 1999; Ryan et al., 1996). Studies focusing on career decision-making difficulties yielded heterogeneous findings. Some authors have reported small or no correlations between decision-making difficulties and family variables (Blustein et al., 1991; Guerra & Braungart-Rieker, 1999; Kinnier, Brigman, & Noble, 1990; Santos & Coimbra, 2000), whereas others reported mediated effects of family variables on career indecision via self-efficacy (Guay et al., 2003; Tokar, Withrow, Hall, & Moradi, 2003). Other studies conducted with adolescents in high school (O'Brien, 1996; Santos, 2001) reported somewhat stronger associations between family variables and decision-making difficulties.

Parental Career-Related Behaviors

Although it has been shown that various characteristics of the family of origin and the parent–adolescent relationship were associated with adolescents' career development, there are rather few studies investigating the major mechanisms by which parents impact adolescents' career development. While researchers have started to explore these mechanisms in qualitative investigations with small samples (Schultheiss, Kress, Manzi, & Glasscock, 2001; Young et al., 2001), very few survey studies have addressed the issue of specific parental behaviors in adolescents' career preparation process (Ferry, Fouad, & Smith, 2000; Guay et al., 2003; Keller & Whiston, 2008; Kracke, 1997; Neuenschwander, 2008). Neuenschwander as well as Kracke showed longitudinal associations between specific parental career support and career exploration in samples of Swiss and German secondary students. Similarly, Keller and Whiston showed positive associations between parental support and career decision-making self-efficacy, and to some extent to career maturity. While parental influence was conceptualized as unidirectional in these studies,

Young and colleagues (Young et al., 2006) demonstrated in their research on adolescents' career development as a family project that the relationship should be conceptualized as bidirectional. Moreover, the authors showed that career choice is one developmental goal, which adolescents and their parents strive for while being engaged in other goals at the same time (Young et al., 2001).

Several interview studies further explored parental behaviors which adolescents perceived to be influential in their career development. The results of these studies (Altman, 1997; Kracke & Noack, 2005; Phillips, Blustein, Jobin-Davis, & White, 2002; Phillips, Christopher-Sisk, & Gravino, 2001; Schultheiss et al., 2001; Young et al., 2001) suggest three facets of parental behavior that are specifically directed to their children's career development (cf. Chope, 2005; Oechsle et al., 2002). The majority of adolescents reported parental support which corresponds to the results from survey research. Parents let their offspring make their own choices while offering orientation and instrumental support (e.g., writing applications) if needed (Kracke & Noack, 2005; Phillips et al., 2001). Parents encouraged the adolescent to explore vocational interests and abilities as well as various occupational options, and helped him or her to reflect on career choice relevant experiences (Schultheiss et al., 2001). The adolescents considered these behaviors to highly promote their motivation to engage in the career preparation process (Phillips et al., 2002). Moreover, the more adolescents felt supported by their parents, the more they engaged in career exploration activities (Kracke & Noack, 2005). However, some individuals also reported that their parents were controlling their career actions and choices too much (Schultheiss et al., 2001). Some of these parents may have wanted to implement or enforce their own ideas about their offspring's occupation regardless of the adolescent's wishes (Young et al., 2001). Adolescents in these families were more passive in the process of career preparation (Kracke & Noack, 2005). In addition, some adolescents reported that their parents did not participate in the career development process at all (Altman, 1997; Mortimer et al., 2002; Oechsle et al., 2002). This lack of parental engagement may be due to actual disinterest in or low importance attributed to the issue of career choice, or because parents may be over-challenged with it. Strain in other life domains may also hinder parents from engaging in their children's career development. Such parental behaviors were considered to reduce adolescents' progress in career development, resulting in less stable career paths (Mortimer et al., 2002).

Taken together, in line with previous qualitative research findings (Oechsle et al., 2002) as well as theoretical considerations (Chope, 2005) we assumed three general facets of parental career-related behaviors. We expected that most adolescents feel supported by their parents. We expected further that some individuals experience their parents as exerting pressure or interfering with their career development process (Phillips et al., 2001). Third, we expected that other individuals' career development process is neglected by their parents (Altman, 1997; Oechsle et al., 2002).

When exploring the role of parents in adolescents' development, gender differences should be considered (Collins & Laursen, 2004). Disengagement, for instance, is more

typical of conflicts with sons than of conflicts with daughters. Furthermore, Grotevant and Cooper (1988) reported that parental overcontrol was correlated with greater overall inhibition and lack of exploration, particularly for boys. In the career domain, Vignoli et al. (2005) found that attachment to parents related to girls' but not to boys' career exploration. They concluded that close relationships may play a greater role for girls' development of vocational identity. Blustein and colleagues (Blustein et al., 1991) showed that a lack of conflicts with parents in combination with a warm relationship buffered premature career choices for girls whereas for boys this relationship was absent. In addition, boys' career commitment profited from some attitudinal dependence on fathers, i.e., adopting fathers' beliefs, whereas for girls the reverse was true. However, little is known about career-specific parental behaviors, because gender differences were often not addressed explicitly. Some previous studies addressing specific career-related behaviors have shown mean differences, indicating that girls perceived more career-related autonomy support and received more positive feedback from parents than boys (Guay et al., 2003; Paa & McWhirter, 2000). Mean differences were less clear for parents' interference since girls experienced a little less interference in a study conducted by Guay et al. (2003), whereas Paa and McWhirter found no difference. In contrast to the considerations stated above, Kracke (1997) reported that independent of adolescents' gender, parents' supportive behaviors seemed to have the same effect on career exploration. Likewise, Guay et al. (2003) found no gender differences in the associations of career-related autonomy support and control with career decision-making self-efficacy. Since research concerning gender differences is still scarce, these findings merit further investigation.

Rationale for Studying Career-Related Behaviors

Scholars of adolescent development (e.g., Kerr, Stattin, Biesecker, & Ferrer-Wreder, 2003) have acknowledged that to fully understand how relationships to parents are important for development in specific phases of life, it is necessary to detect phase specific and domain specific mechanisms underlying this association. For instance, Kerr, Stattin, and Pakalniskiene (2003) reported that parents reacted to adolescents' problem behavior with worry and distrust which in turn associated with an increase in subsequent problem behavior. In their sample, parents did not react directly to delinquency but reacted to adolescents' negative behavior in the family. In addition to worrying more, parents also reduced their efforts to monitor the adolescents' activities and company. Likewise, career development is a topic of career-related family communication and actions (Young et al., 2001). Thus, specific parental career-related behaviors may go along with adolescents' progress in career preparation. For example, adolescents who are very active in preparing their career choice may consult their parents to discuss career choice-related issues. Parents may react with support, ideas, and reflections which in turn may enhance adolescents' career exploration. Again, these ideas provide some evidence for the importance of investigating parental behavior in specifically career-related contexts, such as

career-related support, interference, and lack of engagement.

Research Questions

This study had the following objectives. First, to investigate the construct validity and the reliability of an instrument constructed to assess parental career-related behaviors. It consists of three dimensions (support, interference, and lack of engagement). Second, to examine to what extent parents' career-related behaviors associated with adolescents' career development. Two aspects of adolescents' career development were examined: career exploration and career decision-making difficulties. Given that career exploration has been previously shown to be linked to different measures of the parent–adolescent relationship (Kracke, 1997; Vignoli et al., 2005), we hypothesized that it would relate positively to parental career-related support and relate negatively to lack of engagement. Additionally, parental interference was expected to relate to less career exploration (Kracke & Noack, 2005). As previous research conducted with college students indicated that individuals from overly controlling and enmeshed families were more likely to face difficulties with career decision-making (e.g., Guay, Ratelle, Senecal, Larose, & Deschenes, 2006), we expected a positive relation between parental interference and decision-making difficulties. In addition to these linear associations, we examined interactions of the dimensions of parental career-related behaviors in relation to adolescents' career development. Previous research on parenting styles (Aunola & Nurmi, 2004) has shown that not only linear effects emerge when examining associations between parents' and children's behaviors. Also interactions of different aspects of parenting (warmth \times psychological control) affected children's performance in mathematics. In the career domain it is also likely that such interactions exist, but no previous research has addressed this issue. Third, we investigated whether girls and boys differed (1) in their perceptions of parental career-related behaviors and (2) in the associations between parental behaviors and career exploration or decision-making difficulties. We expected that girls would report more parental support, and less lack of engagement and interference than boys.

Method

Participants and Procedure

The participants were 359 (158 female and 201 male) German adolescents aged 15–18 years ($M = 15.9$, $SD = .95$). They attended 8th to 10th grade ($Mdn = 9$) of secondary schools in the higher and lower track in one German state (Thuringia). In Thuringia, tracked education starts in 5th grade. At this point, 43% of children enter schools in the higher track (Gymnasium) which leads to a university bound school degree after eight years of schooling. Fifty-seven percent enter schools in the lower track (Regelschule) (Statistikstelle des Thueringer Kultusministeriums, 2006). After five years of schooling,

students in the lower track obtain a basic non-college bound degree (Hauptschulabschluss). After six years of schooling, students obtain a qualified non-college bound degree (Realschulabschluss). Thereafter, students in the lower track can move on to vocational education. In 2006, 13.9% of the students in Thuringia left school with lower basic degree, 45.8% left with lower qualified degree, and 32.0% left with college bound degree (Statistikstelle des Thueringer Kultusministeriums, 2006). In this study, 13.7% aimed for lower basic degree, 49.5% aimed for lower qualified degree, and 34.1% aimed for college bound degree.

Data was collected at an apprenticeship fair. This event was organized by a company based in an Eastern German city. The departments of the company presented their current apprenticeship offers to the students. The event was announced in the schools of the area. Consequently, 82% of the participants attended the fair with their school class. Furthermore, 9% were accompanied by friends, 7% by their parents, and 2% attended alone. Questionnaires were administered by members of the company. In addition to the instruments relevant for the present study, the questionnaire included instruments for an evaluation of the event. Such events are part of the mandatory curriculum of career preparation programs at Thuringian schools. Thus, it can be assumed that the sample is representative for Thuringian students.

Measures

Perceived parental career-related behaviors. Based on the existing qualitative literature (Altman, 1997; Kracke & Noack, 2005; Oechsle et al., 2002; Phillips et al., 2001, 2002; Schultheiss et al., 2001; Young et al., 2001) we wrote 32 items along the dimensions parental support, interference, and lack of engagement. After pre-testing the item set with an adolescent sample, seventeen items were removed because of insufficient psychometric properties, and six new items for the interference scale were generated (Dietrich, Olyai, & Kracke, 2006). Dietrich et al. also tested the factorial structure of the scales parental support and lack of engagement by means of confirmatory factor analysis. Both scales could be affirmed as distinct constructs. Due to extreme skewness obtained for the revised interference scale we re-revised the items for this scale. Consequently, the final instrument of parental career-related behaviors (PCB: support, interference, lack of engagement) contained 15 items. Table 1 shows item wordings, means, and standard deviations (item wordings in German appear in Appendix A). Participants were asked to rate all items used in this investigation on a 4-point Likert scale (1 = *does not apply*, 4 = *fully applies*). Internal consistency measured with Cronbach's alpha was adequate for each of the scales (support: .93 for girls and .84 for boys; interference: .72 for girls and .78 for boys; lack of engagement: .68 for girls and .75 for boys).

Adolescents' career exploration. Adolescents' career exploration was assessed using a six-item scale developed by Kracke (1997). The measure captured behaviors regarding exploration of the self (e.g., "I try to find out which occupations best fit my strengths and

Table 1. Item Wordings of Parental Career-Related Behaviors, Means (*M*), Standard Deviations (*SD*), and Factor Loadings For Both Genders (λ).

Item	<i>M</i>	<i>SD</i>	λ		
			unstnd ^a (<i>SE</i>)	λ_{female} stnd	λ_{male} stnd
<i>Support</i>					
1. My parents talk to me about my vocational interests and abilities.	3.04	.89	.89 (.07)	.74	.69
2. My parents encourage me to seek information about vocations I am interested in.	2.81	1.00	.91 (.08)	.69	.61
3. My parents support me in getting an apprenticeship.	3.22	.93	.81 (.07)	.66	.60
4. My parents give advice on the choice of careers available.	3.10	.95	1.00 (.00)	.75	.76
5. My parents talk to me about apprenticeship opportunities in various careers.	2.86	.97	1.05 (.07)	.80	.75
<i>Interference</i>					
6. My parents have their own ideas about my future vocation and try to influence me accordingly.	1.74	.93	.54 (.10)	.41	.43
7. My parents interfere too much with my vocational preparation.	1.93	.98	.74 (.10)	.51	.56
8. My parents try to put through their ideas of my future vocation.	2.03	.99	.84 (.09)	.54	.66
9. My parents would talk me out of a vocation they don't like.	1.79	1.00	.86 (.09)	.53	.67
10. My parents try to push me in a certain direction regarding my future vocation.	1.59	.92	1.00 (.00)	.79	.76
<i>Lack of engagement</i>					
11. My parents are not really interested in my future vocation.	1.46	.87	.80 (.09)	.59	.60
12. My parents don't care about my vocational preparation.	1.56	.88	1.00 (.00)	.74	.73
13. My parents cannot support my vocational preparation, because they know too little about different vocations.	1.87	.93	.64 (.10)	.38	.51
14. My parents cannot support my vocational preparation, because they are too busy.	1.70	.86	.90 (.10)	.66	.67
15. My parents cannot support my vocational preparation, as they face difficulties at work themselves.	1.53	.85	.66 (.12)	.48	.51

Note. Stnd = standardized coefficient; unstnd = unstandardized coefficient; *SE* = standard error.

^aUnstandardized factor loadings were held equal across genders.

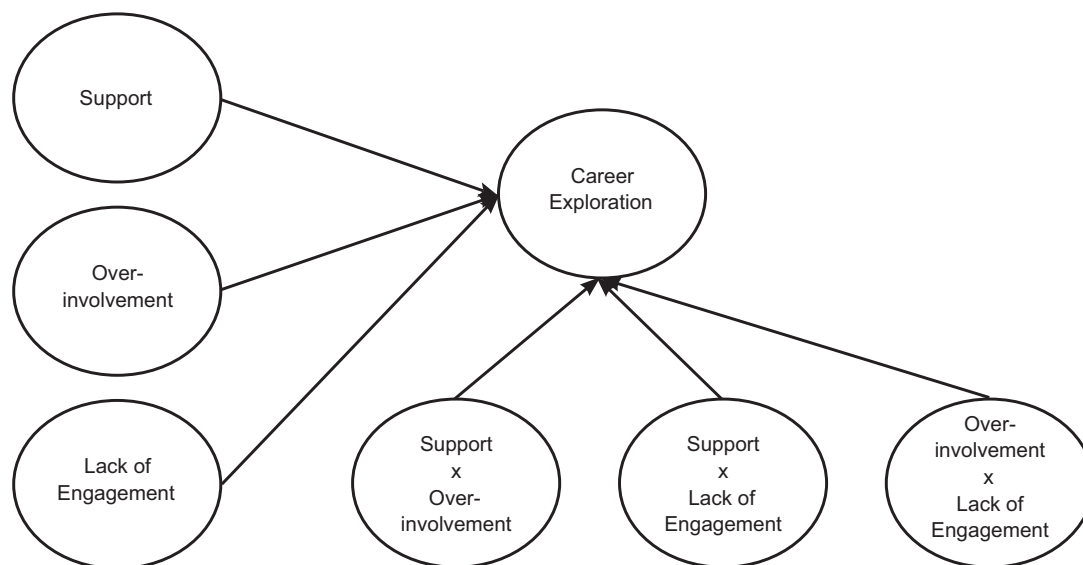


Figure 1. Hypothesized structural model for parental career-related behaviors and career exploration (linear and interaction effects).

weaknesses”) and the environment (e.g., “I talk to as many people as possible about occupations I am interested in”) as well as planfulness of exploration (e.g., “I consider various occupations and try to get extensive information about all alternatives”). Cronbach’s alphas for this scale were .79 for girls and .76 for boys.

Adolescents’ career decision-making difficulties. Career decision-making difficulties were examined by a shortened measure of the scale developed by Seifert (1992). This measure contained seven items about career indecision (e.g., “For me it is very difficult to decide on my future vocation”) and lack of knowledge regarding careers (e.g., “I know too little about possible career paths after school”). Cronbach’s alphas for this scale were .74 for girls and .77 for boys.

Plan of Analysis

The aim of this study was, first, to examine the factorial structure of parental career-related behaviors. Therefore, confirmatory factor analysis (CFA) was carried out to test the assumed three-dimensional structure. Next, structural equation modeling (SEM) was applied to examine the relationships between parental behaviors and adolescents’ career exploration and decision-making difficulties (see Figure 1 for an example of hypothesized structural models). Separate models for career exploration and decision-making difficulties were analyzed to reduce complexity in estimation, particularly in analyzing

interaction effects. As career exploration and decision-making difficulties were unrelated ($r = .05$, n.s.), no accumulation of Type I error resulted from this procedure. To test for gender differences, analyses were carried out as multiple-sample models. This allowed one to fit the same model to both genders simultaneously. Here, factor loadings for the latent variables were held equal across genders whereas means, covariances, and variances were allowed to differ.

Analyses were performed with the Mplus statistical program (Muthen & Muthen, 1998–2006) using the missing data method. This method allows the use of all data available without imputing missing values. Because variables were skewed substantially the parameter estimations were obtained using the MLR (maximum-likelihood robust) estimator implemented in the software (Muthen & Muthen, 1998–2006).

Results

Dimensions of Parental Career-Related Behaviors

Factor structure. Our first research question was to examine the factorial structure of parent's career-related behaviors. We sought to model three dimensions: support, interference, and lack of engagement. For an illustration of the hypothesized factor model see Figure 2. The results of confirmatory factor analysis confirmed the assumed three-dimensional structure of parental career-related behaviors. Our model fitted the data well, $\chi^2(86) = 141.69$, $p < .01$, CFI = .95, TLI = .94, RMSEA = .042, SRMR = .059. The correlation matrix for all variables used in this analysis is shown in Table 2. The results (Figure 2) showed that, whereas support and interference were unrelated, support had a negative association ($r = .59$, $p < .05$) and interference had a positive association ($r = .41$, $p < .05$) with lack of engagement.

Adolescents mainly reported being supported concerning preparation of career choice ($M = 3.01$, $SD = .95$). Parental interference ($M = 1.85$, $SD = .96$) and parental lack of engagement ($M = 1.62$, $SD = .88$) were reported less often.

Gender differences. To examine differences between girls and boys in perceived parents' behaviors we fitted the same model to the data with gender as a grouping variable (multiple-sample method). Although the overall model fit decreased, $\chi^2(196) = 308.66$, $p < .01$, CFI = .91, TLI = .90, RMSEA = .057, SRMR = .075; the assumed three-factor model held for both genders (see Table 1). The results revealed mean differences. Compared to girls, boys reported less support and more interference. Effect sizes for these mean differences were, however, small (support: $d = .20$, interference: $d = .18$). Correlations between the latent variables did not differ for girls and boys (model fit for multiple-sample model with equal correlations for both genders: $\chi^2(199) = 322.30$, $p < .01$, CFI = .90, TLI = .90, RMSEA = .059, SRMR = .092; scaled difference χ^2 test: $\chi^2(3) = .93$, n.s.).

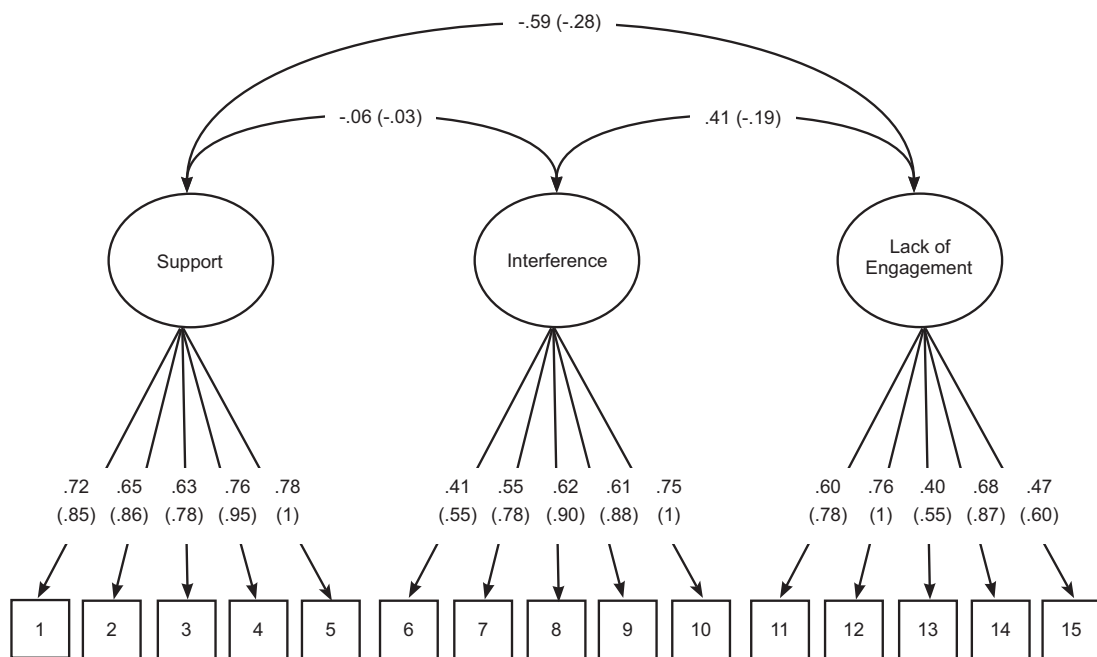


Figure 2. Measurement model for parental career-related behaviors with standardized and unstandardized estimates (in parentheses).

Table 2. Sample Correlation Matrix of Manifest Variables

Scale Item	Support					Interference					Lack of engagement				
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.	–														
2.	.54*	–													
3.	.42*	.37*	–												
4.	.51*	.48*	.49*	–											
5.	.56*	.49*	.49*	.60*	–										
6.	-.08	-.10	-.08	-.03	-.13*	–									
7.	.07	.02	.09	.01	.05	.24*	–								
8.	.04	.06	.08	.00	-.01	.22*	.42*	–							
9.	-.03	-.03	-.08	.00	-.01	.25*	.29*	.36*	–						
10.	-.08	-.11*	-.10	-.10	-.03	.29*	.41*	.47*	.48*	–					
11.	-.24*	-.18*	-.24*	-.22*	-.23*	.10*	.07	.09	.17*	.15*	–				
12.	-.33*	-.26*	-.38*	-.40*	-.34*	.23*	.04	.11*	.21*	.21*	.49*	–			
13.	-.13*	-.02	-.14*	-.08	-.04	.16*	.06	.21*	.26*	.26*	.28*	.26*	–		
14.	-.28*	-.22*	-.28*	-.34*	-.34*	.28*	.08	.11*	.17*	.20*	.41*	.49*	.30*	–	
15.	-.13*	-.16*	-.24*	-.18*	-.17*	.23*	.13*	.21*	.28*	.34*	.24*	.32*	.40*	.32*	–

Note. * $p < .05$.

Associations Between Parental Career-Related Behaviors and Adolescents' Career Exploration and Career Decision-Making Difficulties

Linear associations. Because we did not hypothesize a unidirectional influence from parents to adolescents, the associations between career-related parental behaviors, and adolescents' career exploration and decision-making difficulties were examined in two kinds of structural equation models. First, associations were modeled as bivariate correlations between constructs. Second, parental career-related behaviors were used as simultaneous predictors of exploration and decision-making problems in a regression model (see Figure 1). Associations did not differ between girls and boys. Therefore, we will report results for the entire sample. All coefficients are depicted in Table 3.

The results showed that parental support associated positively with career exploration whereas interference and lack of engagement were not (model fit for correlation model: $\chi^2(182) = 275.52$, $p < .01$, CFI = .94, TLI = .93, RMSEA = .038, SRMR = .054). Likewise, support predicted career exploration in the regression model. However, lower levels of interference and higher levels of lack of engagement predicted lower levels of career exploration. This occurred due to a suppression effect. The model accounted for 36% of the variance in career exploration (model fit for regression model equals correlation model). Furthermore, parental interference and lack of engagement were positively associated with career decision-making difficulties (model fit for correlation model: $\chi^2(182) = 234.73$, $p < .01$, CFI = .97, TLI = .96, RMSEA = .029, SRMR = .054). There was no association with parental support. In the regression model, interference stayed as only significant predictor of decision-making difficulties (model fit for regression model equals correlation model). The model explained 7% of the variance in decision-making difficulties.

Interaction effects. In the next step, the interaction terms of the three dimensions of parental career-related behaviors were added to both previous regression models (Klein & Moosbrugger, 2000). In predicting career exploration, two statistically significant interaction effects were found: the interaction term for support \times interference (*unstandardized estimate* = .20, $p < .05$ [no standardized estimates are available for this kind of model]) and the interaction term for support \times lack of engagement (*unstandardized estimate* = .25, $p < .05$). All linear effects stayed the same as in the regression model without interaction terms. A model difference test (likelihood ratio test) confirmed the significance of the interactions beyond the linear effects, $\chi^2(2) = 17.68$, $p < .05$. High levels of parental support in combination with high levels of interference associated with higher levels of career exploration. Furthermore, high levels of support in combination with low levels of lack of engagement went along with higher levels of exploration. However, the positive linear association between support and exploration held regardless of the levels of interference and lack of engagement. In predicting career decision-making difficulties, one statistically significant interaction emerged: the interaction term for support \times interference (*unstandardized estimate* = .25, $p < .05$). The linear association

Table 3. Correlations of Career Exploration and Decision-Making Difficulties With and Regressions On Parental Career-Related Behaviors (Linear Effects)

	Career exploration		Career decision-making difficulties	
	<i>r</i>	β	<i>r</i>	β
Support	.52* (.22)	.74* (.59)	-.08 (-.04)	.00 (.00)
Interference	-.10 (.04)	-.22* (-.18)	.25* (.13)	.20* (.21)
Lack of engagement	-.09 (-.04)	.41* (.35)	.19* (.09)	.11 (.12)

Note. Unstandardized estimates in parentheses.

* $p < .05$.

between interference and decision-making problems stayed the same as in the regression model without the interaction term. The respective model difference test confirmed the significance of the interaction beyond the linear effect, $\chi^2(2) = 4.63, p < .05$. High levels of parental support in combination with high levels of interference associated with higher levels of career decision-making difficulties.

Discussion

The results provide first evidence that the PCB is a reliable and valid measure of parental career-related behaviors. The results corroborated the assumed three-factor structure (support, interference, and lack of engagement). The results also showed good reliabilities for the three scales. Although support and lack of engagement seem to capture substantively similar aspects of parental career-related activities, which manifested in a relatively high negative correlation between these variables, both dimensions appeared as distinct constructs. This corresponds with the results of an earlier study on parental career-related behaviors (Dietrich et al., 2006). Chope (2005) also distinguished between “a ‘hands-off’ but supportive approach to the client’s decision-making in contrast to a disinterested one” (p. 404). It is likely that adolescents who are very autonomous in career decision-making do not report parents’ career-related support (because they manage career preparation alone) nor their lack of engagement (because parents are not disinterested or over-challenged; cf. Phillips et al., 2001). In addition, we found that lack of parental engagement related moderately to interference. This association may have appeared because participants appraised parents’ behavior only on a good–bad dimension. Adolescents might not have distinguished between lack of engagement and interference, especially when they felt supported. Apart from this rather technical interpretation the relation may as well indicate aspects of less child-centered behavior. If adolescents perceive their parents as putting through their own wishes for the child’s future career

rather than collaborating with the child in preparing for a career this may be interpreted as disinterest in the child's plans and thus lack of 'real' engagement. This pattern is reminiscent of authoritarian parenting as described by Baumrind (1991) and Lamborn and colleagues (Lamborn, Mounts, Steinberg, & Dornbusch, 1991). With respect to mean differences results showed that most adolescents felt supported by their parents while preparing their career choice, only a few individuals reported parental interference or parental lack of engagement (cf. Phillips et al., 2001; Schultheiss et al., 2001).

The results also showed that parental career-related behaviors associated with adolescents' exploration and problems with decision-making. For example, the more adolescents experienced parental career-related support, the more they engaged in career exploration activities. This finding is in line with the results of previous studies that examined the effects of general parent-adolescent relationship (Vignoli et al., 2005) as well as specific career-related parental support (Kracke, 1997; Neuenschwander, 2008). It provides further support for the theoretical proposition of Blustein and colleagues (Blustein, Prezioso, & Schultheiss, 1995) that felt security in the parent-adolescent relationship facilitates career exploration. However, it cannot be inferred from the current cross-sectional data that parental support in fact promotes exploration. Adolescents who engage very actively in career exploration may also elicit their parents' support. They may turn for advice to their parents (Phillips et al., 2001), resulting in augmented parental interest in the child's preparation of career choice. This notion is supported by the results of a short-term longitudinal study (Dietrich, 2008) in which the direction of impact appeared in both directions. In Dietrich's study, higher parental career-related support at the first measurement was associated with more career exploration two months later, and vice versa. The results of Young and colleagues (2001) also point to the reciprocity of career-related activities. One could expect a positive cycle over time – adolescents' intense exploration leading to increased parental support which in turn fosters intensified exploration activities – as well as a negative cycle with diminishing parental support as both antecedent and consequence of low engagement in the career exploration of the adolescent. In contrast to our expectations, we did not find linear associations between parental lack of engagement or interference and adolescents' career exploration. Significant coefficients in the regression model emerged due to a suppression effect as the bivariate correlations were small and non-significant. Thus, although it has been hypothesized that parents' pressure may result in a foreclosed stop of exploration activities and a premature career decision according to the parents' wishes (Savickas, 2002), there was no evidence indicating this in the data.

Whereas linear associations were not found, the results yielded two significant interactions of interference and career-related support, and of lack of engagement and support. The positive linear relationship between parents' career-related support and adolescents' exploration increased with higher interference. This pattern could indicate that higher levels of parents' pressure (which was generally low), when combined with support, functions rather as a motivator for engaging in career exploration than as negative in-

terference (Phillips et al., 2001). In contrast, the positive linear relationship between parents' career-related support and adolescents' exploration decreased with less parents' engagement. That pattern could mean that career-related support is less beneficial when adolescents perceive their parents as being over-challenged with or little interested in career choice preparation at the same time. On the other hand, when adolescents increase their efforts of exploring career options, this engagement may lead to a parallel increase in parents' support and a decrease of parents' lack of engagement.

Concerning career decision-making difficulties, the results showed associations with parental interference and lack of engagement, though interference stayed as only significant variable when predicting decision problems simultaneously. The findings support the assumption that adolescents from overly controlling and enmeshed families are more likely to encounter difficulties in decision-making (Guerra & Braungart-Rieker, 1999; Lopez & Andrews, 1987). It is also likely that parental interference is a reaction to either adolescents' passivity in career preparation or inability to commit to a career goal. Parents may observe their children's decision problems and may start to intervene. The adolescents, in turn, may experience this probably well-intentioned behavior as pressure (i.e., too much involvement) resulting in passivity as a reactant behavior or due to lowered decision-making self-efficacy as suggested by Guay and colleagues (2003). The association between a delay in career decision-making and parental lack of engagement may be explained in two ways. First, indifference from parents may coincide with indifference among the adolescents (Chope, 2005). Second, adolescents, and parents may both attribute little importance to preparing the career choice earlier than just before the transition. Adolescents who show little interest in the process of career preparation probably commit rather late to one career option. Thus, the transmission of (dis-)interest is a possible mediator between parents' lack of engagement and adolescents' career decision-making difficulties. This would explain the rather weak association. Additional to the linear associations found, the results revealed an interaction effect of parental interference and support on decision-making difficulties. Decision problems were associated with simultaneously high levels of interference and support. These behaviors of parents may reflect an increased engagement when they observe decision-making problems in their children rather than the opposite direction of effect, namely (over-)supportive parents causing decision problems.

In the present data we also found some gender differences. In line with our hypothesis girls reported more parental support, whereas boys reported more parental interference. These results are in accordance with previous research (Guay et al., 2003; Kracke & Noack, 2005). The finding that girls experience more parental career-related support may be due to more frequent and deeper communication between girls and parents, especially mothers. Gender differences were, however, small.

Limitations and Directions for Future Research

This investigation has at least five limitations. First, the study relied only on adolescents' perceptions of their parents' behaviors. To ensure they really reflect parents' reactions, data on parents' reports are needed. Studies with multiple sources of information could answer the question whether parents' career-related behaviors are experienced in the same manner by all family members.

Second, the measurement did not distinguish between mothers and fathers. It is known that there are differences in the relationships according to child's and parent's gender (Collins & Laursen, 2004). This study may not have reached such differential effects. The distinctive roles of fathers as a source of information and mothers as confidantes as described by Grotevant and Cooper (1988) could be part of the focus of future investigations.

Third, the data was cross-sectional and did not allow for conclusions regarding whether or not parents affect children or vice versa. In future studies a bidirectional view on the process of preparing the career choice should be adopted as is the case already in some qualitative research programs (Young et al., 2001). This requires longitudinal studies (Dietrich, 2008). In order to examine direction of effects, one could think of microgenetic designs, i.e., longitudinal diary studies with multiple points of measurement. Studies of this kind are particularly valuable around critical transitions in career development during adolescence (e.g., high school to university).

Fourth, when examining the context of preparing career choice in adolescence one has to consider that the context includes many relational, cultural and structural influences that may interact with the role parents play (Vondracek, Lerner, & Schulenberg, 1986). Kracke (2002), for example, found in her longitudinal study that child-centered parenting was associated with peers' career support, and that both parent and peer support were predictive of adolescents' subsequent career exploration. More studies are needed that examine the combined effects of different contexts.

Fifth, although the participants in this study stem from a population of diverse socio-economic backgrounds, they were homogeneous in terms of ethnicity and cultural background (i.e., Eastern German). Consequently, obtained results need to be replicated with culturally diverse samples. First attempts were undertaken by Kracke, Gure, and Dietrich (2008) who tested the scales on parental career-related behaviors in a sample of Turkish adolescents.

Conclusion

This study provides first evidence that adolescents' perceptions of parents' career-related behaviors can be reliably assessed on three dimensions by applying the PCB. Meaningful linear associations and combined effects were found between the dimensions of the PCB and two central aspects of adolescents' career development. Assessing specific career-related parental behaviors can help researchers to understand the mechanisms of parental

influences. Knowing about these mechanisms can serve as a theoretically and empirically sound basis for counseling and the development of interventions.

Study 2. Cross-Informant Ratings of Self- and Other-Regulation at Career Transitions in Adolescence

Dietrich, J. & Kracke, B. (in press). Brief report: Cross-informant ratings of self- and other-regulation at career transitions in adolescence. *Journal of Adolescence*.

Abstract

Individual initiative is required to successfully master career transitions in adolescence, and also parents play an important role in this process. Past research largely omitted co-agency in transition-related activities between adolescents and their parents, which could be described in terms of self- and other-regulation. The present pilot study examined adolescents' and mothers' career-specific regulatory behaviors as perceived from both agents' perspectives. 38 German adolescents rated importance and engagement in one transition-related personal goal and reported on intensity of career exploration activities. Furthermore, they reported on their perceptions of mothers' career-related behaviors and confidence in their offspring's transition management. All measures were also assessed from the mothers' point of view. Results revealed associations within and across family members' ratings that showed similarities as well as differences in perceptions of how behaviors associate. Partial correlation analyses showed that specific maternal behavior not contingent upon her general warmth associated with child behavior.

Introduction

Individuals face various transitions during adolescence that channel development in many ways (Nurmi, 2004). Two lines of research have contributed to our understanding of coping with career transitions. On the one hand, self-regulation theories describe the motivational factors to manage transitions in terms of goal-directed behaviors (Heckhausen, 1999; Nurmi, 2004; Salmela-Aro, 2009): setting and pursuing phase-adequate goals have proven beneficial for attainment of these goals (Nurmi, Salmela-Aro, & Koivisto, 2002). On the other hand, career theories examine various choice relevant behaviors (Savickas, 2005). Among them, exploration behaviors are crucial in youths' development (Porfeli, 2008).

Although relational aspects of goal pursuit have been acknowledged in self-regulation theories (e.g., Meegan & Berg, 2001; Nurmi, 2004; Salmela-Aro, 2009) little is known about how significant others in youths' lives, such as parents, impact their goals. Most previous research focused on parents' impact on aspirations (Massey, Gebhardt, & Garnefski, 2008) while studies on parental influence in the actual process of striving for short-term personal goals are scarce (Nurmi, 2004). Scholars of career development have pointed to the importance of the quality of parent-adolescent relationships in career choice (Whiston & Keller, 2004), and thus many studies regarding parental influence addressed general aspects of the relationship. However, this research strategy does not allow detecting processes of co-development—self-regulation being complemented by other-regulation (Sameroff, 2010)—since no specific regulation behaviors of parents were examined.

Some qualitative investigations have started to explore the specific mechanisms involved (e.g., Young and colleagues, 2001), and recently, parental actions towards their offspring's career development have been examined by using a quantitative approach as well (Dietrich & Kracke, 2009). Going beyond general relationship measures, a focus on career-specific parental behaviors allows studying youths and parents as active agents in shaping own and others' behaviors (Young et al., 2001).

The present pilot study is part of a larger program addressing mutual influences of youths and parents at the transition from high school to either university or vocational training. It provides the first empirical example with multi-informant data (adolescents and their mothers) with the aim of comparing two perspectives of adolescents' self-regulation—i.e., importance and engagement in transition-related goals, and career exploration—and other-regulation—i.e., maternal support and confidence in adolescents' transition management. Specifically, the objectives of this study were, first, to examine to what extent the views of both family members on regulation behaviors were shared. This question is not trivial because subjective views can differ greatly (Tein, Roosa, & Michaels, 1994).

Our second aim was to examine associations between adolescent and mother behaviors within as well as across respondents. Addressing cross-rater effects, also called

partner effects (Kenny & Cook, 1999), allows analyzing associations not only on the individual level, but also on a dyad level. We hypothesized that maternal support related positively to adolescent exploration and goal appraisals (Dietrich & Kracke, 2009). Mothers' confidence in their children's transition management was expected to be high when adolescents show interest and engagement in transition-related activities (Malmberg, Ehrman, & Lithen, 2005). Associations were expected within the reports of both adolescents and mothers as well as across family members. Still, it was predicted that both maternal and youth behaviors were related to maternal warmth as one aspect of relationship quality. Thus, warmth was included as control variable in the analyses.

Method

Participants and Procedure

Questionnaires were administered to 123 German adolescents during regular lessons at school. Adolescents were assessed at the end of their final school year (grade 12). After finishing the higher track of the German educational system, about 60% directly continue their education, typically at university (40% of students) or vocational education (20%; Federal Ministry of Education and Research, 2007). Adolescents' mean age was 18.8 years ($SD = .77$). Mothers were also invited to participate, and 38 mothers eventually took part in the study. Mothers were between 39 and 53 years old ($M = 45.4$, $SD = 4.12$). Of the mothers who provided information on their education ($n = 34$), 21 had reached university degree and 13 had finished vocational education. This is typical for the German school system which is rather selective with respect to educational background (OECD, 2008). Analyses were performed with the subsample ($n = 38$, 19 female, 19 male) for which maternal data were available. Adolescents in the subsample did not differ on the variables of interest from those not included.

Measures

All measures were assessed from the adolescents' and mothers' point of view. Participants were asked to rate all items on 6-point Likert scales (1 = *does not apply, not at all important, invested no effort*, 6 = *fully applies, very important, invested much effort*). Mean scores were computed to be utilized in the analyses.

Adolescents' transition-related goals. Participants filled in the revised Personal Projects Analysis Inventory (Little, 1983). Adolescents were asked, first, to name one current transition-related personal goal. Most respondents named goals related to exploratory activities (e.g., "find out what I want to study"), getting enrolled or getting started in their studies or vocational training (e.g., "have a good start in vocational training"), and doing something else (e.g., "work and travel"). Second, adolescents were

requested to rate the importance of and the engagement with their personal goal. Mothers were asked to report their perceptions of how important transition goals in general were to their child and how much their child engaged in pursuing these goals.

Adolescents' career exploration. Participants reported on three facets (5 items each) of adolescents' exploration (cf. Kracke, 1997; Porfeli, 2008): in-breadth ("I [my child] tried to find out about my [her] strengths and weaknesses in general"), in-depth exploration ("I [my child] talked to people who work in the vocation I am [she is] interested in"), and planfulness of exploration ("I [my child] compare[s] different sources of information").

Mothers' career-related support. Support was measured with the respective subscale (5 items) of the PCB instrument (Dietrich & Kracke, 2009) that was adapted for mothers' questionnaires ("My mother [I] encouraged me [my child] to seek information about vocations I am [she is] interested in").

Mothers' confidence in adolescents' transition management. Confidence was assessed by a newly constructed scale (4 items). For item wordings see Appendix B.

Maternal warmth. Warmth was assessed with the scale by Reitzle and colleagues (2001) (8 items, "My mother is [I am] there for me [my child] when I need her [she needs me]").

Results

Shared Views and Mean Differences

Pearson correlations were computed to examine to what extent the views of adolescents and mothers were interrelated. As Table 1 shows, except for goal importance the results revealed moderate to high associations between the views of dyad members (Cohen, 1988). Mean differences were analyzed with paired *t* tests (Table 1). While adolescents attributed more importance to transition-related goals than mothers perceived, mothers perceived their children as being more engaged than they actually were. Furthermore, mothers perceived themselves as being more supportive than adolescents did.

Associations Between Adolescents' and Mothers' Activities

To examine within person and cross-rater associations of adolescents' and mothers' behaviors we computed three different correlation tables (see Table 2): correlations within adolescents, within mothers, and correlations between dyad member's views on their own behavior. Next, we checked by using partial correlations whether zero-order correlations

Table 1. Cronbach's Alphas (α) and Agreement (Correlations and Mean Differences) Between Adolescents and Mothers On Both Agents' Activities

	α		r	$M(SD)$				
	Ad ^a	Mo ^b		Ad ^a	Mo ^b	t	df	p
<i>Adolescents' behaviors</i>								
Goal importance	–	–	.11	5.24 (1.02)	4.68 (1.12)	2.39	37	.05
Goal engagement	–	–	.30 ⁺	3.61 (1.50)	4.97 (.94)	-5.39	35	.001
In-breadth exploration	.68	.87	.47*	4.04 (.92)	4.12 (1.05)	-0.5	36	<i>ns</i>
In-depth exploration	.71	.89	.54*	3.36 (1.11)	3.47 (1.28)	-0.51	32	<i>ns</i>
Planful exploration	.68	.88	.66*	4.28 (.90)	4.01 (1.17)	1.90	36	.06
<i>Mothers' behaviors</i>								
Support	.83	.73	.67*	4.04 (1.21)	4.66 (.80)	-4.08	35	.001
Confidence in adolescents' transition management	.73	.77	.43*	4.40 (1.08)	4.70 (.94)	-1.68	35	<i>ns</i>

Note. Two-tailed tests were employed for non-directional hypotheses.

^aAd = Adolescents. ^bMo = Mothers.

* $p < .05$. ⁺ $p < .10$. *ns* = non-significant.

Table 2. Zero-Order and Partial Correlations Between Adolescents' and Mothers' Behaviors Within Individuals and Across Family Members (Cross-Rater Associations)

	Goal importance	Goal engagement	In-breadth exploration	In-depth exploration	Planful exploration
<i>Within adolescents</i>					
Support (zero-order)	.10	-.09	.11	.05	.00
Support (partial)	-.09	-.27 ⁺	.13	-.01	-.09
Confidence (zero-order)	.35*	.35*	-.11	.10	.18
Confidence (partial)	.07	.15	-.11	-.02	.06
Warmth (zero-order)	.50*	.40*	-.03	.18	.23 ⁺
<i>Within mothers</i>					
Support (zero-order)	.13	.01	.22 ⁺	.43*	.16
Support (partial)	.00	-.29 ⁺	.12	.27 ⁺	-.04
Confidence (zero-order)	.22	.01	.56*	.52*	.49*
Confidence (partial)	.14	-.20	.55*	.42*	.43*
Warmth (zero-order)	.19	.33*	.20	.35*	.28 ⁺
<i>Across family members^a</i>					
Support (zero-order)	.09	.00	.09	.20	.00
Support (partial)	-.18	-.25 ⁺	.09	.09	-.06
Confidence (zero-order)	.38*	.44*	.25 ⁺	.48*	.48*
Confidence (partial)	.16	.28*	.32*	.44*	.42*
Warmth (zero-order)	.44*	.38*	.01	.23	.26

Note. One-tailed tests were employed for directional hypotheses.

^aAssociations between self-reports of adolescents and mothers on their own behavior. The mean of adolescent and mother ratings in maternal warmth was used as a covariate for computing the partial correlations.

* $p < .05$. ⁺ $p < .10$.

would change when controlling for maternal warmth. Due to the small sample size, relative more importance in interpreting the results was given to effect sizes as compared to significance levels (Kramer & Rosenthal, 1999).

Associations within adolescents. The results showed that mothers' confidence in transition management associated positively with goal appraisals. These associations decreased in size when controlling for maternal warmth, although for goal engagement a small correlation stayed. Moreover, the results showed a negative partial correlation between goal engagement and support.

Associations within mothers. Within mothers, confidence in transition management correlated positively with all adolescent variables (except with goal engagement), even after controlling for maternal warmth. Furthermore, we found positive relationships between support and both in-breadth and in-depth exploration. Additionally, the results showed negative partial correlations between goal engagement and both support and confidence.

Cross-rater associations. Cross-rater associations were found between mothers' confidence in transition management and all adolescent variables, which stayed after controlling for maternal warmth. Moreover, the results showed negative partial correlations between goal appraisals and support.

Discussion

This study compared the views of adolescents and their mothers on both respondents' career-related regulation behaviors. The results revealed relatively high levels of similarity in perceptions of adolescents and mothers for most behaviors, which points to a shared view on the behaviors under study. Furthermore, we found some mean differences in perceptions which, for parent behavior, resembled previous findings (Purdie, Carroll, & Roche, 2004). We also explored within-rater and cross-rater associations between youth and mother behaviors and found similarities as well as differences. In line with expectation, the results consistently showed positive associations between goal importance and confidence (Malmberg et al., 2005), and between in-breadth exploration and support (Dietrich & Kracke, 2009), albeit of small size. Contrary to expectation, when the effect of maternal warmth on the association between support and goal engagement was partialled out the results consistently showed negative correlations. At the same time, in dyads characterized by higher levels of warmth, both adolescents and parents were generally more engaged in dealing with the transition. This could indicate that the more adolescents are able to self-regulate their transition-related behavior, the less support they actually need, and the less support might be given.

We also found differences in the reports on how mother and youth behaviors were correlated: within mothers and also across raters more intensive and planful exploration went along with higher levels of maternal confidence. By contrast, no associations were found within adolescents. This result points to substantial differences in how the relationship between behaviors was perceived by the respondents. That we found robust cross-respondent associations between maternal confidence and adolescent self-regulation suggests that mothers' confidence beliefs, on the one hand, may have a positive effect on adolescent self-regulation. On the other hand, maternal confidence may accurately be formed on the basis of their child's behavior (cf. Jussim, 1991). Why this is not reflected in the youth reports remains to be explored in future research.

Because this research is a first attempt to study adolescent and parent co-regulation quantitatively it has several limitations. Since the sample was very small and self-selection has likely occurred, the results need to be replicated with larger samples, and extended to fathers. Future studies will also need to employ longitudinal designs to test for direction of effects. How self- and other-regulation occur within the overall relationship also deserves further study. It may also be possible that relationship quality moderates the effects of parent behavior on adolescent outcomes (Maisel & Gable, 2009). Moreover, some results may have been influenced by shortcomings in measurement: adolescents reported on one self-articulated goal while mothers rated their perceptions of importance and engagement in their offspring's goals in general. In future studies goal appraisals should be obtained with regard to the same goal in order to obtain more precise interpretations.

Study 3. Transition Phase and Decisional Status as Modifiers of Adolescents' and Parents' Career-Related Behaviors

Dietrich, J., Kracke, B., Noack, P., & Diener, K. (in preparation). Transition phase and decisional status as modifiers of adolescents' and parents' career-related behaviors.

Abstract

Previous research suggests that adolescents' phase-adequate engagement and parents' positive involvement are beneficial for the successful mastery of career-related transitions. The current study focused on adolescents' career exploration and on parents' career-specific support and interference. Moreover, the role of transition-related confidence beliefs for youth and parent behaviors was explored. Questionnaires were administered to German adolescents, their mothers and their fathers. Results revealed differences in adolescents' and parents' career-related behaviors in the final year of high school depending on the temporal phase of the upcoming transition (urgent vs. non-urgent) and on the adolescents' decisional status (decided vs. undecided). Path modeling results further showed that associations between adolescents' and parents' career-related behaviors also differed by transition phase and decisional status. Our findings indicate that not only is adolescents' engagement timed according to the demands of an upcoming transition. Also parents' involvement is sensitive to situation-specific changes when their children approach career-related transitions.

Introduction

During adolescence and young adulthood young people face various transitions within the educational system or from education to working life (cf. Nurmi, 2004). When approaching high school graduation, youths need to screen possible options for their future career and make a decision about the next career step. In this vein, scholars of career development have put great emphasis on the investigation of antecedents and consequences of career exploration, i.e., thinking about one's interests and examining the world of work (e.g., Patton & Porfeli, 2007). Among the antecedents of exploration, the quality of relations to parents turned out to be influential (cf. Whiston & Keller, 2004), but little is known about how parents' specific activities relate to their child's occupational exploration (but see Dietrich & Kracke, 2009; Kracke & Schmitt-Rodermund, 2001). The current longitudinal study adds to existing knowledge in three ways. First, we extend previous research by using the reports from both youths and parents in a multi-dimensional conceptualization of both adolescent exploration and parent career-related involvement. Second, as suggested by research in the academic achievement domain (Pomerantz, Grolnick, & Price, 2005), we investigated the role of transition-related confidence beliefs for youths' and parents' behaviors. Third, the effects of temporal features of a transition on the mutual actions of youths and parents has not yet been addressed. Drawing on Heckhausen, Wrosch, and Schulz' (2010) motivational theory of life-span development we examine differences in adolescents' and parents' career-related engagement as a function of their distance from the transition and their decisional status concerning their future career path.

Adolescent Behaviors: Career Exploration

Exploration behaviors are widely recognized as being particularly adaptive when facing career transitions (cf. Patton & Porfeli, 2007). Different aspects of career exploration can be distinguished. First, individuals can either explore their interests, abilities, career goals or values internally via self-appraisal (*exploration of the self*), or they can externally explore the opportunities in the world of work or various educational and career options (*exploration of the environment*) (e.g., Germeijs & Verschueren, 2006; Kracke & Schmitt-Rodermund, 2001; Rowold & Staufenbiel, 2010). Second, individuals can research very broad information, for instance, about many different occupations (*exploration in-breadth*); or they can explore in greater detail the characteristics of one particular occupation and think about whether they are suited for this kind of work (*exploration in-depth*) (e.g., Gati & Asher, 2001; Germeijs & Verschueren, 2006; Porfeli & Skorikov, 2010; Taveira & Moreno, 2003). The self-environment distinction dominated the career exploration research in the past (Rowold & Staufenbiel, 2010; Stumpf, Colarelli, & Hartman, 1983), but recently received criticism (see Porfeli & Skorikov, 2010, for a discussion). Similar to theoretical developments in identity research (Luy-

ckx, Goossens, Soenens, & Beyers, 2006), the distinction in exploration in-breadth vs. in-depth has received increasing attention in the career literature (e.g., Germeijs & Verschueren, 2006; Porfeli & Skorikov, 2010). Third, the aforementioned types of exploration can be considered as being goal-directed and planful actions (Taveira & Moreno, 2003), which differ from fortuitous exploratory experiences not undertaken with the respective motivation (Jordaan, 1963; Rowold & Staufienbiel, 2010). Individuals thus also differ in the extent to which they employ systematic and planful strategies when exploring their future career (*planfulness of exploration*).

Parent Behaviors: Career-Related Involvement

In line with other developmental domains, scholars of career development have identified family processes as one major context in adolescents' development (Whiston & Keller, 2004). The majority of studies addressed general aspects of the parent–adolescent relationship on an aggregate level (e.g., Blustein, Prezioso, & Schultheiss, 1995). Using information which aggregates across situations and developmental domains, however, does not allow to detect processes of co-development in career choice (Nurmi, 2004), that is, adolescents and parents acting and reacting on each others' behaviors. To overcome this conceptual shortcoming, Dietrich and Kracke (2009) introduced the concept of parental career-related behaviors. Comparable to practices of parental involvement in children's school-related activities (cf. Pomerantz, Moorman, & Litwack, 2007), parents' activities towards their children's career development are addressed in this concept. Such activities include, for example, support (e.g., granting freedom of choice while offering support if needed) and interference (e.g., controlling of adolescents' career-related actions and choices).

Dietrich and Kracke (2009), among others, suggested that parents' support fosters the development of exploration within mutual interactions. Adolescents who are very active in preparing their career choice may consult their parents to discuss career choice-related issues or seek their help (Heckhausen et al., 2010; Phillips, Christopher-Sisk, & Gravino, 2001). Parents, in turn, may react with support, ideas, and reflections which, again, may enhance adolescents' exploration (Phillips, Blustein, Jobin-Davis, & White, 2002). In line with this hypothesis, higher levels of parental support have been found to be associated with more frequent career exploration (Dietrich & Kracke, 2009; Dietrich, Kracke, & Nurmi, 2010; Kracke & Noack, 2005). Some longitudinal evidence further confirmed the importance of support for changes in exploration over time (Kracke, 1997, 2002; Kracke & Schmitt-Rodermund, 2001; Neuenschwander, 2008).

The relationship between parental interference and exploration has been hypothesized to depend on the type of exploration behavior (Luyckx, Soenens, Vansteenkiste, Goossens, & Berzonsky, 2007). On the one hand, it has been suggested that adolescents experience anxiety and indecision as a consequence of parental pressure, which might contribute to more ruminative forms of exploration, that is, in-breadth exploration (Luy-

ckx et al., 2007). At the same time, adolescents' inability to commit to a certain option might elicit parental over-controlling. On the other hand, parental interference has been assumed to be unrelated to the more conscientious type of in-depth exploration—or to be even counterproductive—since in-depth exploration pertains to already existing commitments (Luyckx et al., 2007). Similarly, planfulness of exploration can be expected to be non-significantly or negatively related to parental interference. Empirical research on the relationship between interference and in-breadth and in-depth exploration in the career domain is rare. The only study which discriminated different dimensions of career exploration (Dietrich et al., 2010) provided some support for the hypothesis that in families in which parents engaged in interfering behaviors, youths explored more in-breadth but less in-depth. However, when adolescents were studied within different situations, it turned out that their in-depth exploration was also higher in situations in which they experienced higher levels of parental interference.

The research designs reported so far have some important limitations. First, although the theoretical basis often adopted a bidirectional view on parental influence, data were typically analyzed and interpreted unidirectionally, that is, parents influencing adolescents. This interpretation is particularly common in cross-sectional investigations, which constitute the majority of studies. Second, adolescents were usually investigated as sole source of information. Third, associations between parent and adolescent behaviors have rarely been embedded in the broader context of educational and career transitions and related decision-making processes. However, to understand the processes of parent-adolescent co-development (Nurmi, 2004) it is crucial to incorporate parents' views and to examine the ways of impact in both directions of influence. Moreover, exploring the role of beliefs can help to understand how career-related co-development comes about.

The Role of Beliefs in Career-Related Co-Development

Many scholars in developmental and other fields of psychology (e.g., Eccles, 1994) emphasized the role that perceptions of others' behaviors and beliefs about them play in shaping one's own actions. To date, the role of perceptions and beliefs in understanding parental influence in adolescent career development has not yet been systematically explored. The present study sets out to examine the role of transition-related beliefs in predicting career-related activities. Research in the academic domain has shown that parental beliefs about or confidence in their children's abilities are important factors in students' motivation (e.g., Aunola, Nurmi, Niemi, Lerkkanen, & Rasku-Puttonen, 2002; Galper, Wigfield, & Seefeldt, 1997; Pomerantz et al., 2005). Transferred to the career domain, this implies that parental beliefs about their child's transition management could turn out to be relevant in predicting adolescents' career-related activities. In this study, we included parents' beliefs of being confident that the child will engage in career preparation and that he or she will eventually choose an occupation that fits him/her

(Dietrich & Kracke, in press). Drawing on the findings from the academic achievement domain (Pomerantz et al., 2007) it can be expected that higher confidence beliefs relate to higher levels of exploration in youths. Moreover, confidence beliefs held by parents also shape their own type of career-related involvement (Pomerantz et al., 2007). Hence, it can be assumed that parents who hold more positive beliefs about their child's transition management engage less in interfering behavior (see Pomerantz & Eaton, 2001, for a similar idea).

Transition Phase and Decisional Status as Moderators of Career-Related Behaviors

It is widely acknowledged that how individuals cope with developmental tasks or challenges depends on individual and situation-specific characteristics and how they interact (e.g., Salmela-Aro & Schoon, 2009). The present study applies this idea to adolescent and parent co-development at career transitions. We examined the role of two process features which were assumed to impact the amount of adolescents' and parents' career-related engagement as well as the associations between family members' behaviors: the timing of the upcoming transition, i.e., being in a non-urgent vs. urgent transition phase, and adolescents' decisional status, i.e., being undecided vs. decided about one's future career path. Transition phase and decisional status are likely correlated, but constitute different process features of the situation of facing high school graduation. Facing an immediate transition does not necessarily imply having decided on one's next career step.

Regarding the role of transition phase, it has been suggested that individuals increase their engagement when they approach a transition (Heckhausen et al., 2010). The youths in the present study were in their final year of high school and about to make the transition to college or vocational education. They differed with respect to the temporal constraints of the upcoming transition. Some of the youths were about to move on to further education directly after high school (urgent transition phase), whereas others would have a year off, for example due to military service (non-urgent phase).

Given that the timing of the transition likely influences the level of youths' exploration, we examined whether it also augments parental involvement, and whether it moderates the associations between parents' and youths' activities. According to Heckhausen and colleagues (2010), adolescents who face an immediate deadline (i.e., adolescents in the urgent transition phase) increasingly use external resources such as seeking help from others. The proposed link between support and exploration can thus be assumed to be stronger among those who directly move on to the next step of education or work. The same was expected for interference, since adolescent passivity likely provokes interference particularly in the urgent transition phase. Moreover, it can be assumed that parents, like adolescents, also anticipate the urgency for action due to the upcoming transition (Heckhausen et al., 2010). Hence, if parents do not feel confident that their child will

make a successful transition (i.e., hold a negative belief) they can be expected to increase their engagement in interfering behaviors in times of urgency.

Regarding the role of decisional status, it has been suggested in the career development literature that exploration varies depending on how far adolescents have progressed in making their career decision (Hirschi & Laege, 2007; Porfeli & Skorikov, 2010). Similarly, Heckhausen and colleagues as well as others (e.g., Gollwitzer, 1990) proposed that being decided on and committed to one (occupational) option implies different motivational and cognitive states. While undecided adolescents still ponder about different options for their future career path and are open-minded for various kinds of informational input (Fujita, Gollwitzer, & Oettingen, 2007; Luyckx et al., 2006), decided adolescents favor information supporting the decision they have made (e.g., Kunda, 1990) and engage more in planning the implementation of their choices (Gollwitzer, 1990). It can thus be assumed that undecided youths show higher levels of in-breadth exploration while decided youths engage more in in-depth exploration (cf. Luyckx et al., 2006) and employ more planful strategies when exploring occupational options.

Moreover, since being decided is also associated with being more optimistic (Gollwitzer, 1990), we expected decided youths to attribute higher confidence levels to their parents. Furthermore, it can be assumed that the role of parental activities in adolescent exploration also differs depending on the child's decisional status. Being undecided about one's future when approaching high school graduation could reflect a greater need for external regulation as compared to being certain about one's future career path (cf. Sameroff, 2010, for a similar argument). We hypothesized this to be reflected in higher levels of parental support. Such support could be particularly beneficial for undecided youths, while their decided counterparts may explore independently of the level of parental involvement. Moreover, the assumed positive link between interference and in-breadth exploration can be expected to be stronger in undecided youths who have not made final commitments (Luyckx et al., 2006) and who might therefore be affected more strongly by parental pressure.

Aims of the Present Study

In this study we collected data from every involved family member to disentangle within-individual effects from cross-rater associations in the replication of previous findings on adolescents' and parents' career-related behaviors. Moreover, the role of transition-related confidence beliefs was explored. Finally, and most importantly, we examined whether the levels of and the associations between adolescents' and parents' behaviors depended on temporal conditions of the upcoming transition and youths' decisional status which allowed for conclusions regarding the role of parental behaviors in different phases of the assumed process.

Our analyses were based on a longitudinal design with two measurement points two years apart. At the second measurement point, adolescents were facing graduation from

high school. Here, we assessed the career-related behaviors of both adolescents and parents. In addition, the first measurement point contained assessments of adolescents' previous career exploration activities as well as mothers' and fathers' parenting (warmth and psychological control). Even though these measures were not identical to the career-related behaviors assessed at time 2, the time 1 measures could be used as proxies for previous behaviors in longitudinal analyses. Our design thus enabled us to roughly estimate the stabilities of adolescent and parent behaviors over time, and hence allowed approximating cross-lagged analyses. Based on these data we sought to answer the following research questions:

First, to what extent are ratings of adolescent exploration and parental behaviors associated within adolescents, within mothers and fathers, and across raters? Whereas within-rater associations would display rather subjective views on the assumed process, cross-rater associations would provide stronger evidence for mutual influences. We expected positive associations between adolescent exploration and parental support (hypothesis 1a). Moreover, we assumed a positive association between interference and in-breadth exploration (1b), and negative or no associations with in-depth exploration and planfulness (1c).

Second, to what extent do subjective beliefs predict adolescents' and parents' behaviors? We hypothesized higher confidence beliefs to predict higher levels of exploration in youths (2a) and lower levels of interference in parents (2b).

Third, are the levels of and the relationships between adolescents' and parents' activities more pronounced according to different phases in the process (i.e., transition phase and decisional status)? We expected both youths and parents to show more career-related engagement in the urgent vs. non-urgent transition phase (3a). Youths' in-breadth exploration and parental involvement were assumed to be more pronounced in undecided youths whereas in-depth exploration and confidence beliefs were assumed to be higher in decided youths (3b). Moreover, we hypothesized the associations between adolescents' and parents' behaviors to be more pronounced in youths who were about to make an immediate transition to further education or work (3c), and in undecided vs. decided youths (3d).

Method

Sample and Procedure

The sample was drawn from an ongoing longitudinal study and comprised of German adolescents attending upper track schools (Gymnasium) and their parents. The data used in the present analyses stem from data collections in 10th (time 1) and 12th grade (time 2). Questionnaires were sent out to the schools and handed out to students by the teachers. Adolescents and parents completed the questionnaires at home and sent them back to the investigators via mail.

A total of 473 adolescents (58% female, $M_{age} = 15.9$ years), 332 mothers and 289 fathers were included in data collection at time 1. At time 2, data of 232 adolescents (66% female, $M_{age} = 17.8$ years), 191 mothers, and 177 fathers were available. For $n = 175$ adolescents, data at both time points were available¹. Parents' data at both time points were available for $n = 138$ mothers and $n = 127$ fathers. Mothers' mean age at time 1 was 41.9 ($SD = 4.43$) years and fathers' mean age was 44.5 years ($SD = 5.18$). 63% of the mothers and 60% of the fathers had completed lower track education, 11% and 13%, respectively, had higher track education without university degree, and 27%/26% of parents were college educated. The over-representation of parents with college education is typical for the higher track of the German educational system which is rather selective with respect to educational background (OECD, 2008).

Measures

Except for adolescents' exploration at time 1, every family member reported on all youth and parent behaviors.

Adolescents' career exploration at time 1. Adolescents' overall career exploration in grade 10 was assessed on with six items on a 4-point Likert scale (1 = *does not apply*, 4 = *fully applies*) (e.g., "I try to find out which occupations best fit my strengths and weaknesses", Kracke, 1997). Cronbach's alpha for this scale was .76.

Parenting styles at time 1 and 2. Parental warmth and psychological control were assessed on a 4-point Likert scale (1 = *does not apply*, 4 = *fully applies*) with three items each from the instrument by Reitzle and colleagues (2001). Cronbach's alphas for maternal/paternal warmth (sample item, "My mother/father is always around when I need her/him") were .77/.84 for adolescents and .67/.62 for mothers/fathers. For psychological control (sample item, "My mother/father always wants to change me to fit her/his standards") alphas were .71/.74 for adolescents and .71/.73 for mothers/fathers.

Adolescents' career exploration at time 2. Participants reported on three facets of adolescents' exploration (cf. Dietrich & Kracke, in press; Kracke, 1997; Porfeli & Skorikov, 2010): in-breadth exploration (6 items, e.g., "I [my child] tried to find out about my [her] strengths and weaknesses in general"), in-depth exploration (6 items, e.g., "I [my child] talked to people who work in the vocation I am [she is] interested in"), and

¹Attrition analyses were performed with adolescents who took part in data collection at both measurement points vs. those who took part at time 1 only. Youths who completed both waves were more likely to be female, $\chi^2(1) = 3.90, p < .05$. Adolescents did not differ in career exploration ($t(443) = -1.42, n.s.$) nor their perceptions of parenting styles, i.e., warmth (mothers $t(457) = .76, n.s.$; fathers $t(443) = .17, n.s.$) and psychological control (mothers $t(456) = -1.77, n.s.$; fathers $t(443) = -.62, n.s.$).

planfulness of exploration (5 items, e.g., “I [my child] compare[s] different sources of information”). With respect to planfulness, participants rated each item on a 6-point Likert scale ranging from 1 = *does not apply* to 6 = *fully applies*. With respect to broad and in-depth exploration, participants were requested to report how frequently (1 = *never* to 5 = *very often*) they had engaged in the respective activities within the last six months. Parents in turn reported perceived engagement. In addition, participants could indicate when they had engaged in that specific activity earlier, but not during the last six months (0 = *not during the last six months but before*). This category was collapsed with category 1, since both indicate that a person had not engaged in that activity during the last six months. For in-breadth exploration, this procedure resulted in bimodal item distributions with peaks on both ends of the scale. The data for both in-breadth exploration and in-depth were thus recoded again. The result was a 4-point scale in which the original categories 0, 1 and 2 were collapsed to indicate infrequent engagement. The categories 3 to 5 were retained. After recoding, the in-breadth exploration items were evenly distributed². Cronbach’s alphas for the planfulness/in-breadth/in-depth exploration scales were .72/.77/.75 for adolescents, .87/.83/.83 for mothers and .83/.82/.87 for fathers.

Parents’ career-related involvement at time 2. Career-related behaviors were measured with the respective subscales of the PCB instrument (Dietrich & Kracke, 2009) that were adapted for parents’ questionnaires (support, 5 items, e.g., “My mother/father [I] encouraged me [my child] to seek information about vocations I am [she is] interested in”; interference, 4 items, e.g. “My mother/father [I] would talk me [my child] out of a vocation they [I] don’t like”; for item wordings see Appendix A). Cronbach’s alphas for maternal/paternal support were .83/.91 for adolescents and .79/.82 for mothers/fathers, and for interference .80 for adolescents and .70/.75 for mothers/fathers.

Parents’ confidence in adolescents’ transition management at time 2. Confidence beliefs were assessed with 4 items (Dietrich & Kracke, in press, e.g., “My mother/father is [I am] confident that I [my child] will cope with the entry into university or vocational training”). Cronbach’s alphas for adolescents’ beliefs about maternal/paternal confidence were .66/.67, .71 for mothers’ beliefs and .72 for fathers’ beliefs.

Transition phase at time 2. Adolescents reported on their plans for the year following high school graduation. Those who indicated that they would definitely make a transition to college or vocational training were coded as 1 (being in the urgent phase). Others were coded as 0 (being in the non-urgent phase). Their moratorium activities included

²Correlations between in-breadth exploration and other time 2 variables did not substantially differ by type of recoding (recoding as described above vs. original coding with leaving out the cases who fell into the zero category).

military or civil service, au pair, voluntary year of social service, and travelling. $N = 134$ participants (58.3%) were in the urgent group, $n = 87$ (37.8%) were in the non-urgent group. Nine (3.9%) participants had missing data on the grouping variable.

Adolescents' decisional status at time 2. Adolescents' decisional status was assessed with one item (adapted from Nurmi, Seginer, & Poole, 1995). Adolescents were requested to tick one out of five statements that best described their current situation. The statements ranged from 1 = *I have no idea which occupations are suitable for me* (undecided) to 5 = *I have decided on my future occupation or study majors* (decided). To be utilized in moderation analyses, the item was recoded into two categories to distinguish decided and undecided youths. Values 1 to 4 were coded as undecided; value 5 was coded as decided. After recoding, $n = 128$ participants (55.7%) were in the undecided group, $n = 95$ (41.3%) were in the decided group. Seven (3.0%) participants had missing data on the grouping variable.

Analysis Strategy

Path analyses served to examine the associations between parent behaviors, adolescent exploration, and beliefs within and across individuals. Separate models were run for mothers and fathers. To arrive at testable and not too complex path models, we tested each assumed direction of influence in separate models (see Figures 1 and 2). That is, when predicting adolescent exploration, their self-ratings of exploration were used as the criterion variables. Both adolescents' and parents' ratings of parental involvement as well as adolescents' ratings of parental confidence beliefs were used as the predictor variables. In the same vein, when predicting parental involvement, parents' ratings of it were used as the criterion variables. Adolescents' and parents' ratings of exploration as well as parents' ratings of confidence beliefs were used as the predictor variables. Note that testing directions separately does not allow for causal inferences since the aforementioned behaviors were assessed at one time point (i.e., time 2).

In the next step, the time 1 variables were included in the models. In predicting youths' exploration, we controlled for previous exploration activities in grade 10. In predicting parents' involvement, we controlled for previous parenting style in grade 10.

Multi-sample analyses were carried out for each of the moderators (transition phase and decisional status). Path analyses were performed with the Mplus statistical program (Muthen & Muthen, 1998-2006) by using full information maximum likelihood estimation. Due to skewness of the parent behavior variables and the non-normality of the in-breadth exploration scale, we used the maximum-likelihood robust estimator which yields robust model estimations even when normality assumptions are not met (Muthen & Muthen, 1998-2006).

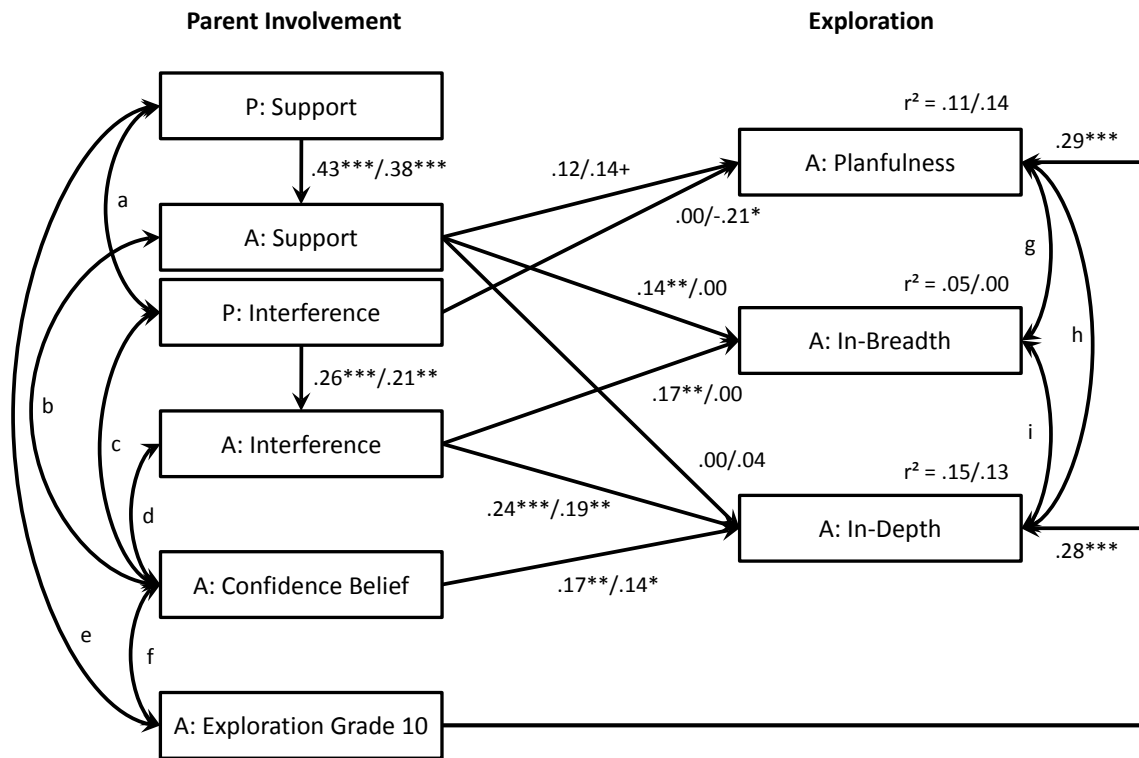


Figure 1. Final path model for the regression of exploration on maternal/paternal involvement. Completely standardized robust maximum likelihood parameter estimates. Correlation estimates are $a = .21^{***}/.27^{***}$, $b = .18^{**}/.28^{***}$, $c = -.24^{***}/.00$, $d = -.30^{***}/-.24^{***}$, $e = .19^{**}/.00$, $f = .17^*/.14^*$.
 $^{***} p < .001$. $^{**} p < .01$. $^* p < .05$. $^+ p < .10$.

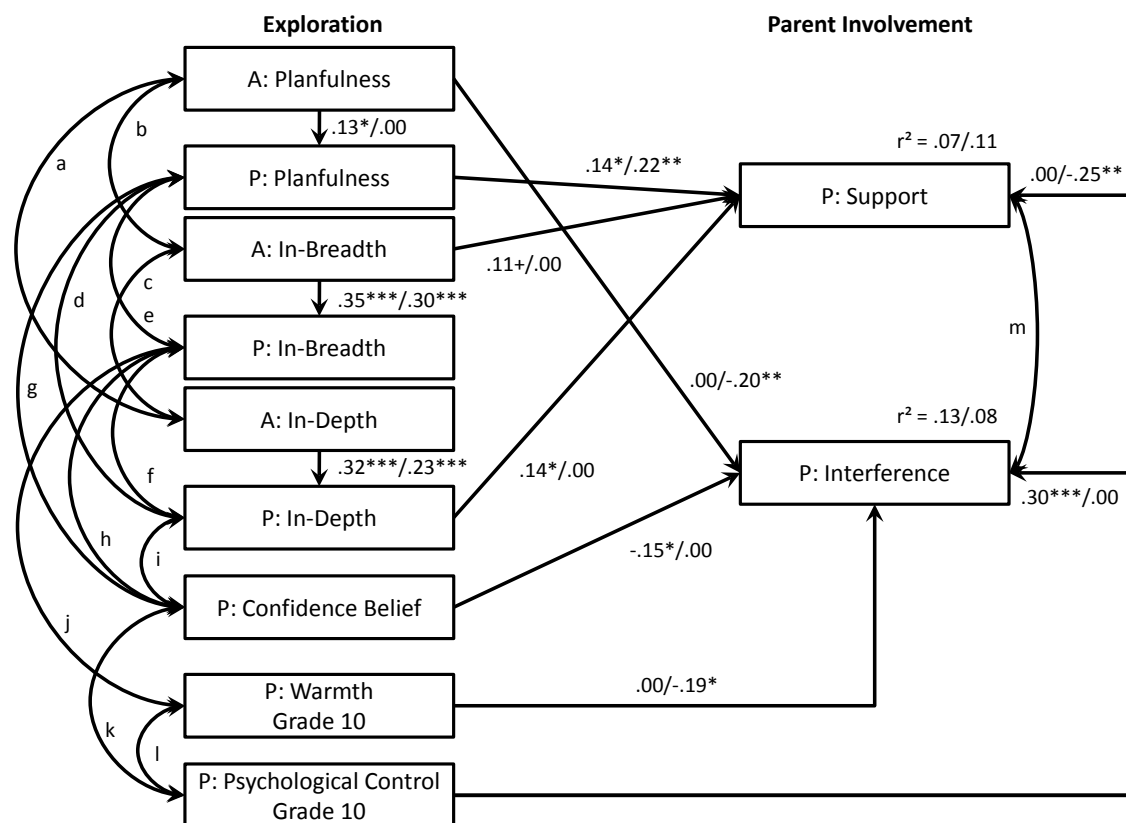


Figure 2. Final path model for the regression of maternal/paternal involvement on exploration. Completely standardized robust maximum likelihood parameter estimates. Correlation estimates are $a = .29^{***}$, $b = .17^*$, $c = .44^{***}$, $d = .47^{***}/.36^{***}$, $e = .36^{***}/.30^{***}$, $f = .38^{***}/.52^{***}$, $g = .31^{***}/.50^{***}$, $h = -.12^*/.23^{**}$, $i = .22^{***}/.38^{***}$, $j = .00/-0.18^*$, $k = -.18^*/.00$, $l = .00/-0.26^{**}$, $m = .24^{***}/.32^{***}$.
 $*** p < .001$. $** p < .01$. $* p < .05$. $+ p < .10$.

Results

Descriptive Statistics

As shown in Table 1, there was considerable agreement among family members on youths' in-breadth exploration and in-depth as well as on parents' career-related support and confidence. Agreement was low for planfulness of exploration and interference. Moreover, adolescents' ratings of their mothers' and fathers' career-related involvement were highly correlated, as were both parents' ratings on their perceptions of the child's exploration and their own involvement. In addition, family members generally reported high mean levels of planfulness in exploration and medium levels of in-breadth exploration and in-depth as well as high levels of parental support and confidence but low levels of interference (see Table 2).

Adolescents' decisional status was associated with the transition phase they were in. Being in the urgent transition phase corresponded with being decided about future career, $\chi^2(1) = 15.53, p < .001$. While in the urgent phase decided and undecided youths were equally frequent, in the non-urgent phase there were more undecided than decided youths.

Path Models: Total Sample Results

Two kinds of path models were set up to predict adolescent exploration and parent involvement, respectively. First, all possible regression paths from the predictors to the criteria as well as correlations among the predictors and among the criteria at time 2 were estimated. This procedure resulted in saturated models. Next, non-significant paths were set to zero and only significant paths were retained. In the final step, the time 1 variables were added to the model. Again, non-significant paths between time 1 variables and criteria as well as between time 1 variables and other predictors were set to zero to obtain the final models³. In predicting mothers' involvement, their warmth in grade 10 did not add to the explained variance.

Figures 1 and 2 show the final path models for predicting youths' exploration and parents' involvement (see Table 1 and Appendix C for bivariate correlations between the variables). The final models showed good fit to the data: predicting exploration by maternal/paternal involvement, $\chi^2(18/20) = 19.70/24.08, p = .350/.239, CFI = .99/.97, TLI = .98/.96, RMSEA = .02/.03$; predicting maternal/paternal involvement by exploration, $\chi^2(26/37) = 24.28/44.78, p = .560/.177, CFI = 1.00/.96, TLI = 1.00/.95, RMSEA = .00/.03$.

³When predicting exploration, we also included perceived parenting styles at time 2 as control variables. This was done to obtain the unique contribution of parents' career-related involvement to adolescent exploration. However, perceived parenting did not add a significant proportion of explained variance and was thus omitted from the final models (see Appendix C).

Table 1. Correlations Among Time 2 Variables

Scale Item	Career exploration							Support							Interference							Confidence						
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.							
1. Planful (A)	—																											
2. Planful (M)	.21**	—																										
3. Planful (F)	.14	.47**	—																									
4. In-breadth (A)	.17*	-.02	.08	—																								
5. In-breadth (M)	.17*	.35**	.26**	.34**	—																							
6. In-breadth (F)	.05	.13	.31**	.31**	.58**	—																						
7. In-depth (A)	.29**	.14*	.18*	.43**	.21**	.13	—																					
8. In-depth (M)	.20**	.40**	.26**	.18**	.49**	.34**	.38**	—																				
9. In-depth (F)	.14	.33**	.39**	.07	.33**	.50**	.29**	.54**	—																			
10. Mo support (A)	.18**	-.03	.12	.16*	.11	.05	.12	.15*	.05	—																		
11. Mo support (M)	.00	.20**	.20**	.13	.13	.11	.13	.23**	.15*	.42**	—																	
12. Fa support (A)	.18**	.10	.20**	.05	.06	-.00	.15*	.12	.00	.61**	.22**	—																
13. Fa support (F)	-.02	.13	.28**	-.03	.02	.09	.00	.08	.16*	.13	.26**	.38**	—															
14. Mo interference (A)	-.06	-.05	-.13	.16*	.11	.06	.17**	.13	.00	.00	.04	-.09	.02	—														
15. Mo interference (M)	-.12	-.06	-.05	.05	-.05	.04	.06	-.01	.03	-.00	.22**	-.17*	.06	.26**	—													
16. Fa interference (A)	-.06	.05	-.12	.03	.10	-.01	.15*	.12	.01	-.05	-.03	.04	.12	.67**	.15*	—												
17. Fa interference (F)	-.20**	-.08	.05	.07	-.08	-.01	.05	-.06	-.04	-.07	.01	-.00	.26**	.13	.52**	.23**	—											
18. Mo confidence (A)	.11	.16*	.28**	-.08	.00	.08	.11	.12	.24**	.20**	-.02	.34**	.10	-.35**	-.23**	-.17*	—											
19. Mo confidence (M)	.05	.36**	.33**	-.09	.02	-.07	.11	.26**	.24**	.07	.19**	.00	-.04	-.21**	-.02	-.17*	.37**	—										
20. Fa confidence (A)	.13*	.10	.26**	-.07	-.03	.10	.11	.13	.27**	.21**	-.03	.28**	.03	-.22**	-.23**	-.14	.85**	.38**	—									
21. Fa confidence (F)	.06	.32**	.49**	-.08	.09	.19*	.13	.17*	.40**	.19*	.14	.11	.05	-.05	-.07	-.11	-.12	.36**	.47**	.42**	—							

Note. A = adolescent report. M = maternal report. F = paternal report. Mo = mother. Fa = father.

*p < .05. **p < .01. ***p < .001.

Table 2. Means and Standard Deviations (in Parentheses) for the Variables at Time 2

Variable	Total sample						Transition phase						Decisional status					
	Non-urgent			Urgent			Undecided			Decided			Undecided			Decided		
	Child	Mother	Father	Child	Mother	Father	Child	Mother	Father	Child	Mother	Father	Child	Mother	Father	Child	Mother	Father
<i>Adolescent exploration</i>																		
Planfulness	4.69 (.77)	4.65 (1.05)	4.72 (.91)	4.66 (.71)	4.55 (1.07)	4.56 (1.04)	4.69 (.82)	4.74 (1.05)	4.84 (.83)	4.60 (.80)	4.50 (1.04)	4.67 (.97)	4.80 (.74)	4.84 (1.05)	4.84 (.84)	4.80 (.74)	4.84 (1.05)	4.84 (.84)
In-breadth	2.51 (.76)	2.62 (.82)	2.62 (.78)	2.43 (.67)	2.66 (.79)	2.62 (.76)	2.54 (.80)	2.61 (.85)	2.64 (.81)	2.55 (.70)	2.64 (.78)	2.63 (.78)	2.45 (.83)	2.59 (.86)	2.64 (.81)	2.45 (.83)	2.59 (.86)	2.64 (.81)
In-depth	2.67 (.70)	2.59 (.81)	2.65 (.81)	2.51 (.68)	2.40 (.82)	2.50 (.91)	2.79 (.69)	2.73 (.79)	2.74 (.74)	2.53 (.66)	2.42 (.77)	2.47 (.81)	2.90 (.70)	2.84 (.82)	2.91 (.74)	2.90 (.70)	2.84 (.82)	2.91 (.74)
<i>Parent involvement</i>																		
Support	4.41 (1.02)	4.84 (.96)	4.84 (.96)	4.22 (.96)	4.69 (.96)	4.69 (.96)	4.52 (1.05)	4.94 (.94)	4.94 (.94)	4.37 (1.01)	4.91 (.92)	4.44 (1.04)	4.49 (1.04)	4.78 (.99)	4.47 (1.07)	4.49 (1.04)	4.78 (.99)	4.47 (1.07)
Support	3.90 (1.20)	4.47 (1.05)	4.47 (1.05)	3.80 (1.09)	4.42 (1.06)	4.42 (1.06)	3.93 (1.42)	4.49 (1.05)	4.49 (1.05)	3.81 (1.23)	4.49 (1.05)	4.44 (1.04)	4.01 (1.37)	4.47 (1.07)	4.47 (1.07)	4.01 (1.37)	4.47 (1.07)	4.47 (1.07)
Interference	2.21 (1.13)	2.85 (1.20)	2.85 (1.20)	2.30 (1.09)	2.78 (1.17)	2.78 (1.17)	2.18 (1.18)	2.90 (1.21)	2.90 (1.21)	2.26 (1.13)	2.90 (1.18)	2.26 (1.13)	2.18 (1.14)	2.83 (1.19)	2.90 (1.21)	2.18 (1.14)	2.83 (1.19)	2.90 (1.21)
Interference	2.02 (1.03)	3.07 (1.22)	3.07 (1.22)	2.17 (1.04)	3.06 (1.17)	3.06 (1.17)	1.94 (1.01)	3.09 (1.27)	3.09 (1.27)	2.04 (.97)	3.09 (1.27)	3.20 (1.23)	1.99 (1.10)	2.90 (1.21)	2.90 (1.21)	1.99 (1.10)	2.90 (1.21)	2.90 (1.21)
Confidence	4.61 (.89)	5.21 (.83)	5.21 (.83)	4.40 (.95)	5.12 (.85)	5.12 (.85)	4.77 (.83)	5.30 (.79)	5.30 (.79)	4.49 (.90)	5.11 (.84)	4.99 (.88)	4.79 (.87)	5.36 (.81)	5.33 (.74)	4.79 (.87)	5.36 (.81)	5.33 (.74)
Confidence	4.72 (.87)	5.14 (.84)	5.14 (.84)	4.53 (.96)	5.03 (.99)	5.03 (.99)	4.85 (.83)	5.20 (.74)	5.20 (.74)	4.58 (.87)	5.20 (.74)	4.99 (.88)	4.91 (.88)	5.33 (.74)	4.91 (.88)	4.99 (.88)	5.33 (.74)	5.33 (.74)

Note. Scale range for planfulness of exploration, support, and interference: 1 = low, 6 = high. Scale range for exploration in-breadth and in-depth: 1 = never, 4 = very often.

As Figure 1 shows, perceived maternal support predicted higher levels of in-breadth exploration while paternal support marginally predicted planful exploration, which was in line with our expectation. The support-planfulness path for mothers decreased to non-significance after controlling for exploration in grade 10. Similarly, a path between perceived paternal support and in-depth exploration decreased to non-significance after controlling for previous exploration. Moreover, higher levels of perceived maternal interference predicted more in-breadth exploration, while higher levels of father-reported interference predicted less planful exploration. This was also in line with our hypotheses. In contrast to our expectations, higher perceived levels of both parents' interference also predicted higher levels of in-depth exploration. And, for both parents, higher levels of attributed confidence predicted higher levels of in-depth exploration.

As Figure 2 shows, higher levels of perceived planful exploration predicted higher levels of support among both mothers and fathers. Moreover, adolescent-reported in-breadth exploration and mother-reported in-depth exploration predicted higher levels of mothers' support. Lower levels of adolescent planfulness predicted higher levels of fathers' interference. For mothers, less positive confidence beliefs predicted higher levels of interference.

Moderator Analyses: Transition Phase and Decisional Status

Next, two kinds of moderator analyses were conducted. First, a series of *t* tests was carried out to test mean differences on the career-related behaviors as a function of the transition phase and adolescents' decisional status. Second, multi-sample path models were carried out for both moderating variables on the basis of the total sample final path models.

Mean differences. The results (Table 2) showed that youths in the urgent phase engaged more in in-depth exploration, which was evident in all respondents' reports, youths $t(218) = 2.90, p = .004, d = .40$, mothers $t(191) = 2.78, p = .006, d = .41$, and fathers $t(160) = 1.77, p = .077, d = .28$. And, fathers perceived youths in the urgent phase as employing more planful exploration strategies, $t(161) = 1.92, p = .056, d = .30$. Moreover, youths in the urgent phase received more support from their mothers, youths $t(213) = 2.14, p = .033, d = .31$, mothers $t(194) = 1.75, p = .081, d = .26$. Adolescents in the urgent phase also perceived their parents as being more confident in their transition management, youths about mothers $t(213) = 3.03, p = .003, d = .42$, youths about fathers $t(201) = 2.48, p = .014, d = .35$.

The results showed further that decided adolescents explored more in-depth, youths $t(220) = 3.90, p < .001, d = .53$, mothers $t(193) = 3.62, p < .001, d = .52$, fathers $t(162) = 3.60, p < .001, d = .57$. Decided youths also employed more planful exploration strategies which was evident in youths' and mothers' reports, youths $t(221) = 1.96, p = .051, d = .27$, mothers $t(193) = 2.26, p = .025, d = .33$. Last, parents of decided youths

were more confident in their child's transition management, youths about mothers $t(215) = 2.45$, $p = .015$, $d = .34$, youths about fathers $t(203) = 2.62$, $p = .009$, $d = .37$, mothers $t(197) = 2.12$, $p = .035$, $d = .31$, fathers $t(161) = 2.65$, $p = .009$, $d = .42$.

Differences in associations between adolescent and parent behaviors. We estimated initial models in which all parameters were allowed to vary across groups. The fit of these models was excellent: initial model for transition phase, model 1a/1b (see Table 3) $\chi^2(36/40) = 36.35/35.79$, $p = .452/.660$, CFI = .99/1.00, TLI = .99/1.00, RMSEA = .01/.00; model 2a/2b, $\chi^2(52/74) = 47.94/74.10$, $p = .634/.475$, CFI/TLI = 1.00/1.00, RMSEA = .00/.00; initial model for decisional status, model 1a/1b, $\chi^2(36/40) = 39.53/42.42$, $p = .315/.367$, CFI = .98/.98, TLI = .97/.98, RMSEA = .03/.02, SRMR = .06/.07; model 2a/2b, $\chi^2(52/74) = 58.15/71.54$, $p = .259/.559$, CFI = .97/1.00, TLI = .96/1.00; RMSEA = .03/.00. The path coefficients from these models are summarized in Table 3. To test whether paths significantly differed between the groups we compared two kinds of models. A restricted model with all paths held equal across groups was estimated as the comparison model. For each path that showed different coefficients in the initial models we estimated a model in which this path was allowed to vary across groups. Satorra-Bentler (SB) scaled χ^2 difference tests were used to determine whether the coefficient significantly differed across groups⁴. Regarding the prediction of exploration the multi-sample results showed that perceived maternal support predicted planful exploration in adolescents in the urgent phase, but not in the non-urgent phase ($SB\chi^2 = 2.93$). Moreover, while the link between maternal interference and in-breadth exploration was more pronounced in the urgent phase ($SB\chi^2 = 4.58$), the link with in-depth exploration was stronger in the non-urgent phase ($SB\chi^2 = 3.93$). Perceived maternal support predicted planful exploration in undecided adolescents but not in decided ones ($SB\chi^2 = 2.93$). Perceived paternal support related positively to in-depth exploration in undecided youths, whereas this association was slightly negative in decided youths ($SB\chi^2 = 9.15$). Associations between maternal interference and in-depth exploration ($SB\chi^2 = 8.28$) as well as between paternal interference and planful exploration ($SB\chi^2 = 3.37$) were more pronounced in decided youths. Regarding the prediction of parental involvement the multi-sample results showed that mothers' perceptions of in-depth exploration predicted their support in the urgent phase only ($SB\chi^2 = 3.25$). Adolescents' less planful exploration strategies related to more paternal interference, in the urgent phase but not in the non-urgent phase ($SB\chi^2 = 6.19$). Furthermore, maternal confidence related to

⁴The $SB\chi^2$ is reported for those coefficients which statistically differed across groups, with $SB\chi^2 > 3.84$ being significant at $p < .05$, and $SB\chi^2 > 2.71$ being marginally significant at $p < .10$. Marginally significant group differences are reported in cases in which r^2 considerably differed across groups (by at least .05). This was the case for the following criteria: planful exploration, non-urgent/urgent phase: $r^2 = .000/.053$ for mothers, undecided/decided $r^2 = .055/.003$ for mothers, undecided/decided $r^2 = .081/.122$ for fathers; support, non-urgent/urgent phase: $r^2 = .026/.127$ for mothers, undecided/decided $r^2 = .024/.219$ for fathers; interference, undecided/decided $r^2 = .007/.097$ for fathers.

their interference in the non-urgent phase only ($SB\chi^2 = 8.59$). Fathers' perceptions of planful exploration predicted their support more strongly in decided youths ($SB\chi^2 = 3.14$). Similarly, the negative link between adolescents' planful exploration and paternal interference existed only in decided youths ($SB\chi^2 = 2.86$). Finally, maternal confidence related to their interference only when adolescents were undecided ($SB\chi^2 = 3.84$).

Discussion

The current study on adolescents' and parents' career-related behaviors had three aims: First, to examine associations between adolescent career exploration and parent career-related involvement. Second, to explore the role of transition-related confidence beliefs in predicting family members' behaviors. And third, to compare different groups of youths with respect to the transition phase they were in and their decisional status.

Results revealed significant associations between adolescent and parent behaviors. As predicted, the higher adolescents' exploration was, the higher was parents' support. This reflects earlier findings obtained with adolescents' self-reports (Dietrich & Kracke, 2009; Neuenschwander, 2008) and extends them by mothers' and fathers' views as well as a differentiated perspective on different facets of career exploration (cf. Dietrich & Kracke, *in press*). Since predictions could be made on youths' exploration and parents' support, the results provide tentative evidence to suggest both directions of influence. That is, parental support leading to and being elicited by adolescents' engagement in exploration.

Regarding interference, some results were in line with our expectations whereas others were not. As expected, the higher fathers' interference was, the less planful and systematic were the exploration strategies the adolescents employed. Similar results have been obtained by Smits and colleagues (2010). These authors found that youths who employed an information-oriented identity exploration style, which is characterized by actively searching information in order to make well-informed choices, perceived their parents as being less controlling. Furthermore, our results showed that the more youths perceived their mothers as interfering, the higher was their in-breadth exploration. This finding corroborated Luyckx and colleagues' (2007) propositions about a positive relationship between controlling parenting and in-breadth identity exploration. However, we also found that the more youths, again, perceived their parents as interfering, the higher was their in-depth exploration. This was in contrast to Luyckx and colleagues' assumptions stating no or even a negative relationship between controlling parenting and in-depth exploration. The unexpected positive association we and others (Crocetti, Rubini, & Meeus, 2008) found was perhaps caused by youths who employed a normative identity exploration style (Berzonsky, 1992), which has been shown to be related to controlling parenting (Smits et al., 2010). That is, youths who experienced parental pressure to consider their favorite alternative might indeed have explored those options in order to comply with parents' wishes. On the other hand, youths might have sought

Table 3. Standardized Beta Coefficients by Transition Phase and Decisional Status Obtained from Multi-Sample Path Analyses)

Path	Transition phase		Decisional status	
	Non-urgent	Urgent	Undecided	Decided
<i>Predicting exploration (model 1a): Model for mothers</i>				
Exploration Grade 10 → Planful exploration	.10	.37***	.29**	.31**
Exploration Grade 10 → In-depth exploration	.21 ⁺	.28***	.32**	.22**
Support (A) → Planful exploration	-.01	.23*	.22*	-.02
Support (A) → In-breadth exploration	.22**	.06	.19**	.10
Interference (A) → In-breadth exploration	.07	.25***	.12	.27**
Interference (A) → In-depth exploration	.32**	.25*	.13 ⁺	.41***
Confidence (A) → In-depth exploration	.17	.18*	.16*	.09
<i>Predicting exploration (model 1b): Model for fathers</i>				
Exploration Grade 10 → Planful exploration	.09	.36***	.28**	.31**
Exploration Grade 10 → In-depth exploration	.21 ⁺	.29***	.37**	.26***
Support (A) → Planful exploration	.05	.16 ⁺	.23*	.01
Support (A) → In-depth exploration	.12	.00	.23*	-.17 ⁺
Interference (F) → Planful exploration	-.05	-.27***	-.07	-.36***
Interference (A) → In-depth exploration	.30*	.16*	.12	.28***
Confidence (A) → In-depth exploration	.11	.15 ⁺	.13 ⁺	.13
<i>Predicting parent involvement (model 2a): Model for mothers</i>				
PsyCon Grade 10 → Interference	.15	.37***	.34**	.24*
Planful exploration (M) → Support	.13	.18*	-.03	.30***
In-breadth exploration (A) → Support	.09	.12	.13	.08
In-depth exploration (M) → Support	-.01	.21*	.32***	.07
Confidence (M) → Interference	-.39***	-.04	-.24**	-.03
<i>Predicting parent involvement (model 2b): Model for fathers</i>				
PsyCon Grade 10 → Support	-.03	-.36***	-.16	-.31**
Warmth Grade 10 → Interference	-.12	-.25*	-.20	-.15
Planful exploration (A) → Support	.25 ⁺	.24**	.14	.39***
Planful exploration (F) → Interference	.03	-.31***	-.09	-.30**

Note. . A = adolescent report. M = maternal report. F = paternal report. PsyCon = psychological control. Coefficients which significantly differed between groups are printed in *italics*.

*** $p < .001$. ** $p < .01$. * $p < .05$. ⁺ $p < .10$.

more information on their own preferred alternative in order to convince their parents of their choice when parents were too controlling. Or, parental interference might, in general, keep youths focused on the developmental task of occupational choice and might push them to explore either way, in-breadth and in-depth.

To shed more light on the findings on interference and exploration future research would benefit from examining the motivation behind youths' exploration. According to self-determination theory (Ryan & Deci, 2000), autonomously motivated youths might engage in career exploration because they are intrinsically motivated and value the search of career information as a means to progress in their career development, whereas youths with controlled motivation might experience pressure to think and explore in particular ways.

The current results further showed that subjective confidence beliefs related to youths' and mothers' behaviors. That is, when adolescents believed their mothers and fathers to be confident that they will successfully manage the upcoming transition they engaged more in in-depth exploration. On the one hand, this result corroborated our assumption that positive perceptions of parental beliefs indeed might lead to more exploratory action, mirroring the results obtained in the academic achievement domain (Pomerantz et al., 2007). On the other hand, particularly those adolescents who explore in-depth might feel most competent and might make highest confidence attributions. The results also revealed that, as predicted, mothers' negative beliefs about their child related to higher levels of interference. This provides tentative evidence to suggest that beliefs indeed might play some role in shaping mothers' behaviors (Pomerantz et al., 2007), which has been hypothesized but rarely been investigated empirically.

With respect to transition phase and youths' decisional status the results showed mean level differences in adolescent and parent activities as well as differential relationship patterns. Regarding mean level differences we found that adolescents in the urgent transition phase explored more in-depth and received more support from their mothers. This finding corroborates Heckhausen and colleagues' (2010) assumptions on intensified engagement in an urgent transition phase and extends previous theory by showing likewise increases in mothers' engagement. Although expected, an increase of in-breadth exploration in the urgent phase was not found, perhaps indicating that in-depth exploration is the core adaptive behavior in this phase when a decision has to be made (Gati & Asher, 2001).

Furthermore, in line with Gollwitzer's (1990) notions, decided youths employed more planful exploration strategies which are indicative of the hypothesized implementation intentions. Likewise, decided youths explored more in-depth information (cf. Gati & Asher, 2001). According to Luyckx and colleagues (2006), in-depth exploration particularly occurs after youths have made commitments, whereas adolescents explore broadly while in the cycle of commitment making. The latter proposition, however, was not confirmed in our data, perhaps because when facing high school graduation, most adolescents might have formed initial commitments already.

Moreover, parents of youths who were decided about the next career step held higher confidence beliefs about their child's transition management. From the adolescents' perspective, this can be explained with greater optimism in decided youths (Gollwitzer, 1990). Yet, being decided also decreases uncertainty, which in turn could inform higher confidence levels among parents.

Another important issue was to test whether transition phase and decisional status moderate the strength of associations between youths' and parents' behaviors. In line with our predictions, links between support and exploration were more pronounced when adolescents were in the urgent transition phase. Likewise, links of interference with in-breadth exploration and planful exploration strategies were stronger in times of urgency. These results lend support to our assumptions derived from Heckhausen et al.'s (2010) model. Together with the mean level results they suggest that indeed, parents' involvement seems to be timed in accord with the upcoming transition. Mothers' beliefs, on the other hand, predicted their interference in the non-urgent phase only, contradicting our expectations. Perhaps mothers rather believe in the non-urgent than in the urgent phase that it is possible to influence their child when, in mothers' opinion, things go wrong. In times of urgency, however, they might feel more helpless in the face of their child's non-optimal transition management.

The results further revealed that the positive link between parents' interference and youths' in-depth exploration remained significant in both groups, but was more pronounced in youths in the non-urgent phase. This result is not in line with our assumption that associations would be stronger in the urgent phase and indicates that the interference-in-depth exploration link is possibly driven by other mechanisms. As discussed above, these mechanisms should be in the focus of future research that includes adolescents' motivation behind the exploration of specific occupational options.

Third, with respect to decisional status the results showed that when exploration was the criterion to be predicted, links with support were stronger in adolescents who had not yet made a final decision on their future career path. This finding corroborated our assumption that parental support could be beneficial in particular for not yet decided youths. In contrast, when (paternal) support was the criterion to be predicted, the link with planful exploration strategies was stronger in decided adolescents. Although unexpected, this finding makes sense because decided youths might consult their fathers with specific questions (Phillips et al., 2001), thus eliciting fathers support. Especially fathers are known to be a source of informational support for adolescents (Grotevant & Cooper, 1988).

The results further showed that, in contrast to our expectations, the associations between parents' interference and adolescents' career exploration were more pronounced in adolescents who had committed themselves to one occupational option. This result further informs the hypothesis that links between exploration and parental controlling could be driven by adolescents with a normative identity style who adopt commitments from external sources, for instance from their parents (Berzonsky, 1992). Although

youths who experience parental pressure might explore in-depth information about these adopted commitments when facing a transition, our results also indicate that they do not do so in a systematic and critical way. On the other hand, parents might become aware of that their child has uncritically adopted an occupational commitment. An unreflected occupational choice, in turn, might lead parents to start interfering.

Last, when youths were undecided about career issues and at the same time their mothers were little confident in their transition management, mothers engaged more in interfering behaviors. In line with our expectation, this indicates that mothers' controlling is particularly associated with negative beliefs under uncertainty about the child's future. To summarize the results on the role of transition phase and decision status for adolescents' and parents' career-related activities, we can state that generally, the proposed mean level differences between the phases and decision statuses were confirmed. The results on differential relationship patterns between youth and parent behaviors, on the other hand, were mixed and merit further investigation. However, the present findings underscore parents' role in adolescents' successful mastery of transitions and suggest avenues for future research (cf. Salmela-Aro & Schoon, 2009).

Limitations and Directions for Future Research

First, our longitudinal design allowed only for the approximation of cross-lagged analyses. For final conclusions regarding directions of influence research designs with repeated measurement of the same constructs with identical measures are warranted. Still, to our knowledge, this study is the first of its kind. Because we could control for time 1 proxies of the behaviors to be predicted at time 2, the final predictions entail genuine effects of parental career-related involvement in predicting career exploration, and of exploration in predicting parent involvement. To go beyond, a research strategy that tracks short-time fluctuations of adolescent exploration and parent involvement (for example, by using diary methods; Burk, Denissen, Van Doorn, Branje, & Laursen, 2009) would enable researchers to examine the assumed processes on the developmental micro-level (Dietrich, Kracke, & Nurmi, 2010).

Second, in order to keep our path models testable, we only analyzed linear relationships between adolescent and parent activities. However, the results of previous research point to possible interaction effects of support and interference in predicting exploration (Dietrich & Kracke, 2009). Moreover, in order to further examine the mechanisms behind the links of parent involvement and adolescent exploration, it seems useful to analyze configurations of the exploration dimensions. For example, our results revealed linear relationships of interference with both in-depth exploration (positive) and planful exploration strategies (negative). To arrive at even more conclusive results, future research would benefit from adopting a person-oriented view which allows, for example, to examine relationships between different configurations of youths' exploration and parents' career-related behaviors (von Eye, Mun, & Bogat, 2008).

Third, due to restrictions in sample size we were not able to examine interaction effects of transition phase and decisional status. This, however, would be an interesting avenue for future research. One could test assumptions as, for example, whether parental interference is especially likely when adolescents face an immediate transition but have not yet decided on their next career step. Moreover, it seems warranted to examine the different phases of the transition process in longitudinal investigations.

Last, the generalizability of our results is limited to college-bound German youths. A focus on other groups of adolescents from different age groups, educational levels, geographical regions, and on other career-related transitions will advance knowledge to develop a general theory on adolescent and parent behavior at transitions.

Conclusion

Despite its limitations, this study provided a valuable insight into the activities of youths and their parents at the edge of graduation from high school. Since this is a major transition in the lives of young people, knowledge about what facilitates adolescents' coping with this task will turn out to be useful in fostering smooth transitions, for example, through targeted interventions.

Study 4. Parents' Role in Adolescents' Decision on a College Major: A Weekly Diary Study

Dietrich, J., Kracke, B., & Nurmi, J.-E. (in press). Parents' role in adolescents' decision on a college major: A weekly diary study. *Journal of Vocational Behavior*.

Abstract

This study examined 39 adolescents during their transition to university. In standardized weekly diaries over several weeks ($M = 8.13$) adolescents reported on engagement in career exploration (in-breadth and in-depth self and environmental exploration), their parents' transition-related involvement (frequency of conversations, support, and interference), and their satisfaction with how the transition progressed. The results showed that exploration largely fluctuated across weeks, whereas parent involvement was more stable. Family members' engagement varied according to the phase of the application process the adolescent was involved in. The more adolescents explored during a given week, the more they talked to their parents, and the more supportive parents were. Associations between interference and exploration differed by type of exploration. Both exploration and support contributed to higher satisfaction.

Introduction

At career transitions, individuals can engage in a variety of adaptive behaviors (Heckhausen, Wrosch, & Schulz, 2010; Nurmi, 2004; Savickas, 2005). For example, when adolescents invest effort in finding a job or apprenticeship after finishing school, or when they emphasize transition-related goals, they are more successful in finding a suitable position (Haase, Heckhausen, & Koeller, 2008; Nurmi, Salmela-Aro, & Koivisto, 2002). In the same vein, when adolescents engage in career exploration, that is, think about their occupational interests and examine the world of work, they are subsequently better adjusted in their university studies or vocational training (Germeijs & Verschueren, 2007; Kracke & Schmitt-Rodermund, 2001). Moreover, the more engagement youths show during educational or career transitions, the more satisfied they are with their choices (Schindler & Tomasik, 2010), and the higher is their well-being (Haase et al., 2008).

As the focus of previous research has been mainly on adolescents' engagement and its outcomes, less is known about how this engagement is complemented and affected by what significant others do (cf. Heckhausen et al., 2010). In adolescence, parents are youths' main partners when it comes to deciding on their future career path (Tynkkynen, Nurmi, & Salmela-Aro, 2010). Whereas some evidence has demonstrated that parents influence the kinds of goals youths set and engage in, the evidence on parents' role for adolescent exploration is comparably scarce (Nurmi, 2004). Regarding the design of existing studies, only cross-sectional and longitudinal studies with rather long time intervals between measurement points have been conducted on the topic. While exploration has been conceptualized as a highly fluid behavior (Gati & Asher, 2001), there is a lack of research demonstrating this situational variability. In this study, we examined how youths' engagement in terms of career exploration fluctuated in the transition period between the end of school and the beginning of university studies and how the adolescents perceived their parents being involved in this process. We employed a weekly diary intensive longitudinal design with adolescents making the transition from high school to college in Germany. First, we examined the extent to which adolescent and parent engagement fluctuated from week to week. Second, we studied how adolescent engagement was complemented by parent involvement on a general level, as well as on the level of specific situations. And third, we investigated whether youths' engagement paid off in terms of higher satisfaction with the choice process, and whether parents' involvement also contributed to it.

Career Exploration and Its Consequences

Career exploration in adolescence has been described as deliberate and purposeful actions of seeking and processing information that people engage in to enhance their knowledge of the self and the outer world with respect to future career (Blustein, 1992; Taveira

& Moreno, 2003). This implies that individuals can engage in several forms of career exploratory activities (e.g., Gati & Asher, 2001; Germeijs & Verschueren, 2006; Porfeli & Skorikov, 2010; Taveira & Moreno, 2003). First, individuals can engage in *self-exploration* and reflect on their interests, abilities, career goals or values. Second, they can explore the opportunities in the labor market or various educational and career options (*environmental exploration*). Third, they can collect very broad information either towards the self or towards the world of work (*in-breadth exploration*). And fourth, they can look for detailed information on particular occupational options and think thoroughly about how well they would fit in that occupation (*in-depth exploration*).

In accordance with the career theory by Super (1990), career exploration increases during the high school years (Creed, Patton, & Prideaux, 2007) and particularly before making a career transition (Germeijs & Verschueren, 2006). Furthermore, past longitudinal research revealed differential associations between the above mentioned facets of career exploration and several indicators of positive career development. In line with theories on identity formation (Luyckx, Goosens, Soenens, & Beyers, 2006), in-depth exploration has been shown to be associated with positive outcomes, such as decreases in career indecision and increases in career confidence, planning, and commitment (Germeijs & Verschueren, 2006; Porfeli & Skorikov, 2010). In-breadth exploration, on the other hand, has been described as less adaptive (Luyckx et al., 2006). However, there are ambiguous findings in the career domain: in line with Luyckx et al.'s theorizing, Porfeli and Skorikov (2010) found a less favorable relationship pattern between exploration in-breadth and indecision, confidence and planning. By contrast, Germeijs and Verschueren (2006) found positive relationships between broad environmental exploration during the last high school year and positive career development.

In accordance with developmental theories of motivation (Heckhausen et al., 2010; Nurmi, 2004; Salmela-Aro, 2009), which propose that individuals profit from phase-adequate engagement, career exploration has been found to predict adjustment after the transition from high school to university, such as commitment to university studies and academic motivation (Germeijs & Verschueren, 2007). Developmental motivation theories also propose that individuals profit from phase-adequate engagement in terms of well-being and satisfaction. Whilst this relationship has been demonstrated for goal engagement in general (e.g., Haase et al., 2008; Schindler & Tomasik, 2010), we are not aware of any evidence to suggest such benefits concerning career exploration.

The longitudinal studies described above were based on designs with intervals of at least several months between the measurement points (e.g., Creed et al., 2007; Germeijs & Verschueren, 2006; Porfeli & Skorikov, 2010). Such designs offer valuable insights on the macro-level of development (Lichtwarck-Aschoff, van Geert, Bosma, & Kunnen, 2008) but are not informative about development on the micro-level while making career-related choices, such as college major choice. In fact, Gati and Asher (2001), in their PIC model of career decision-making, have proposed that career exploration could be a highly fluid behavior. To the best of our knowledge, however, no attempt has been undertaken

to track short-term fluctuations of career exploration. Yet studying situational or within-person variation in adolescents' exploration would enable researchers to understand the actual processes of engagement during particular transitions (cf. Mroczek, Spiro III, & Almeida, 2004). In doing so, this within-person variability could also be predicted by specific characteristics of the situations. For example, Heckhausen and colleagues (2010) proposed that goal engagement increases when individuals approach a deadline. One could assume micro-cycles of goal striving consisting of different phases that predict the level of engagement in a specific situation.

The role of significant others, such as parents, in shaping adolescent behavior during transitions can also be understood in more detail when distinguishing interactions in specific situations from variability in the relationships of parents and children living in different families.

The Role of Parents in Adolescents' Career-Related Transitions

The application of Bowlby's (1969) assumptions about the attachment–exploration link in childhood to career development during adolescence has been popular during the last two decades (cf. Blustein, Prezioso, & Schultheiss, 1995; Grotevant & Cooper, 1988). Both cross-sectional and recent longitudinal research has confirmed that attachment to parents indeed seems to foster higher engagement in exploration (Beyers & Goossens, 2008; Germeijs & Verschueren, 2009). Even attachment assessed in early childhood predicted career exploration during the adolescent years (Roisman, Bahadur, & Oster, 2000).

But how does a positive relationship quality translate into specific behaviors? To address this question, Dietrich and Kracke (2009) developed the parental career-related behavior scales which tap several types of parental involvement, such as support (i.e., freedom of choice while offering support if needed) and interference (i.e., parental controlling of adolescents' career-related actions and choices). Focusing on specific parental behaviors particularly allows one to study processes of what has been called co-development (Nurmi, 2004) or co-agency (Salmela-Aro, 2009). In line with general theories on benefits of parental warmth and support for adolescent adjustment (e.g., Barber, Stolz, & Olsen, 2005), a growing number of studies has consistently shown positive concurrent and longitudinal associations between support and exploration (Dietrich & Kracke, 2009; Dietrich, Kracke, Noack, & Diener, 2010; Kracke, 1997, 2002; Kracke & Noack, 2005; Neuenschwander, 2008). It has further been suggested that the relationship between parental interference and exploration could be more specific depending on the type of exploration behavior (Luyckx, Soenens, Vansteenkiste, Goossens, & Berzonsky, 2007). On the one hand, it has been assumed that adolescents experience anxiety and indecision as a consequence of parental pressure, which might contribute to more ruminative, i.e., in-breadth exploration (Luyckx et al., 2007). And, adolescents' inability to commit to a certain option might also elicit parental over-controlling. On the other hand, parental in-

terference might not be effective in stimulating in-depth exploration activities, or might be even counterproductive. Research in the career domain has shown, however, that parents' controlling or interfering behaviors related to higher levels of both in-breadth and in-depth exploration in the final school year (Dietrich et al., 2010).

During career transitions, potential benefits of parental involvement could depend on its timing and on the situation-specific adequacy of the involvement. It is likely that parent involvement fluctuates across situations, such that parents adapt their actions to the situation of their child. This has been theoretically described as parental other-regulation, which complements the child's engagement, i.e., self-regulation (Sameroff, 2010). Moreover, it has been suggested that parents' involvement might also influence the adolescents' satisfaction with their studies, with support and accommodation relating to higher satisfaction, and directing and interference to lower satisfaction (Chang, Heckhausen, Greenberger, & Chen, in press). Thus, parental involvement can be expected not only to interact with youths' engagement, but also to benefit their satisfaction with the progress of the transition. Both questions are addressed in the current study.

The Transition From School to University: The German Context

After finishing high school, about 60% of German students directly continue their education, with 40% of students directly entering university studies, and about 20% entering vocational education (Federal Ministry of Education and Research, 2007). In this study, the focus was on those adolescents who plan to move directly from high school to university. Unlike in the United States, for example, German students apply for getting into a particular subject instead of getting into a particular university. The application process starts when students receive the results of their final school exam (Abitur) in late spring. The application procedure then typically takes place during summer, and studies begin in fall. For applications on subjects with restricted access there is a nationwide deadline in mid July, while applications to free-access subjects might be accepted until two weeks before the semester starts. Generally speaking, the application process could be described in several phases. Initially, people are sending their applications. The number of applications sent may vary from one (for example, to a free-access subject) to several (for popular subjects). After applications are sent, people are waiting for letters of admission or rejection. Eventually, they decide on their favorite option and matriculate.

Aims of the Present Study

This study takes a process perspective in the examination of the role of parental involvement in adolescents' engagement in exploration during their transition to university. In accord with well established theories about career development (Jordaan, 1963) and recent development in the career exploration literature (cf. Germeijs & Verschueren, 2006; Porfeli & Skorikov, 2010), we assessed four different aspects of exploration, that

is, in-breadth and in-depth as well as self and environmental exploration. To capture parental involvement, we assessed the frequency of adolescent-parent interactions tapping transition-related issues, as well as adolescents' perception of parental support and interference during these interactions (Dietrich & Kracke, 2009). Last, we investigated how both youths' and parents' engagement related to youths' satisfaction with their progress in the application procedure.

By using a multilevel data analytic approach, we aimed to disentangle situation-specific (i.e., within-person) variation from inter-individual or inter-family (i.e., between-person/family) variation in the relationships among youth and parent behaviors (cf. Mroczek et al, 2003). It is important to note here that different processes might be at work on different levels of analysis (cf. Lichtwarck-Aschoff et al., 2008). This could imply, for instance, that associations between adolescent engagement and parental involvement might be positive when the focus is on specific situations (i.e., the within-level). On the contrary, when the focus is on inter-individual or family level differences (i.e., the between-level) a different pattern with even negative associations could emerge (see Snijders & Bosker, 1999, p. 28).

We examined the following research questions:

1. To what extent do adolescent exploration and parent involvement vary from week to week, and to what extent are they stable characteristics of the individuals and relationships? In accord with Gati and Asher (2001) we expected exploration to be highly variable. However, given that no previous studies exist which focus on short-term fluctuations of either career exploration or parental career-related involvement we employed an exploratory and descriptive approach to this question.
2. Given the expectation that adolescents' and parents' behaviors are subject to short-term fluctuations, do behaviors vary depending on the phase of the application process? Our aim was not only to demonstrate within-person variability but also to detect its possible sources. We anticipated both youth and parent behaviors to be phase sensitive: more activity was expected when adolescents were either in the phase of sending out applications, or receiving admission letters and making their final decision (hypothesis 2a). Assuming micro-cycles of goal striving (Heckhausen et al., 2010), both the sending of applications as well as the final decision can be considered deadlines which stimulate higher levels of engagement. Additionally, before adolescents send applications, they need to screen alternatives and select their decision criteria (Gati & Asher, 2001), while in the phase of making the final decision at least some youths might reconsider their choice criteria and alternatives before they eventually matriculate. Accordingly, less adolescent activity was expected while youths wait for reply from the colleges they applied to (b). Given that parents' other-regulation should be adaptive to adolescents' situation (Sameroff, 2010), we expected to find the same phase-specific pattern of activity for parental involvement (c).

3. Are adolescents' exploration and parent involvement associated (a) at the level of the relationship (that is, across situations), and (b) are they associated within individuals in particular situations? First, we examined whether the intensity of youths' career exploration associated with the frequency of conversations with their parents. It can be assumed that during weeks, when adolescents explore relatively much, they also reflect the information they gathered with their parents. Second, since past questionnaire research has generally confirmed the link between support and exploration (Dietrich & Kracke, 2009) we expected a positive relationship in particular at the level of situations. Third, based on Luyckx et al.'s (2007) propositions we hypothesized a positive association with exploration in-breadth, and a negative or no association with exploration in-depth.
4. Does adolescent engagement predict higher satisfaction with how the application process progresses (a), and does parental involvement also predict this satisfaction (b)? Drawing upon propositions in the developmental literature on goal pursuit (Heckhausen et al., 2010; Nurmi, 2004; Salmela-Aro, 2009) we expected more adolescent engagement to be reflected in higher satisfaction with how they progress in the application procedure. Moreover, we assumed that whether and how parents are involved in the transition contributes to youths' satisfaction (cf. Chang et al., in press). That is, we assumed that perceived parental support (vs. interference) related positively (negatively) to satisfaction during the transition to university.

Method

Sample and Procedure

The sample consisted of German students attending upper track schools (Gymnasium) who were facing the transition to university. The sample was recruited from an ongoing longitudinal study, in which students had participated in an assessment during their final school year. A total of 46 students agreed to participate in a weekly diary study that would follow them until enrolment into one major. For the current analyses, only those participants were included who had completed at least 2 weeks of data collection. For that reason, 6 cases had to be removed from the final sample. Furthermore, one participant had completed two assessments which were ten weeks apart. This participant was also excluded. The remaining sample consisted of 39 adolescents (31 female, 8 male). Compared to the other potential diary participants (youths who had indicated planning an immediate transition to college, $n = 138$ out of $N = 232$), the actual 39 diary participants did not differ in terms of gender, career exploration nor parental involvement.

The main data collection took place over 21 weeks from June to September 2009. Data of four participants was collected in a pilot data collection in 2008. Participants

completed between 2 and 21 assessments ($Mod = 9$, $M = 8.13$, $SD = 3.74$). In sum, the final dataset contained $N = 317$ weekly assessments done by the 39 participants. Of these, 34 adolescents had eventually enrolled at a university at the end of the study, 2 participants had ended up working or doing a Voluntary Year of Social Service, and 3 had dropped out of the study. Five adolescents in the final sample reported not living with both parents. One person lived only with the father, and four people lived only with their mothers. Moreover, the four participants of the pilot study had reported only about the involvement of their mothers, no data is available on their fathers.

Measures

Adolescents' career exploration. Participants reported on four facets of career exploration: in-breadth and in-depth exploration of the inner and outer world (self vs. environmental exploration). They indicated on a 6-point Likert scale (1 = *not at all*, 6 = *very intensively*) how intensively they had engaged in each of the activities. Appendix D contains item wordings. All analyses were conducted with both a mean score across all items and the single items. We computed Cronbach's alpha for the mean score on the between level by using the aggregate score across time points for each person. Since each item represents a distinct sub-dimension of career exploration, the Cronbach's alpha was low at .53.

Phase in the application process. Participants indicated whether during the last week they had sent at least one application, whether they had received at least one letter of admission, and whether they had finally enrolled at a university. Dummy variables were created to reflect three phases in the application process: a sending phase (until the last application was sent), a waiting phase (between sending and receiving) and a receiving phase (from the receipt of the first letter of admission until matriculation).

Frequency of conversations with parents. Participants indicated on a 5-point Likert scale how often during the previous week they had talked to their parents about transition-related issues (1 = *never*, 2 = *1-2 times*, 3 = *3-4 times*, 4 = *almost daily*, 5 = *daily*).

Perceived parental career-related behaviors. When participants indicated that they had talked to their parents during a particular week, they were requested to report on parental support and interference during the interactions with their mothers and fathers. Each dimension was assessed with two items which were adapted from the PCB instrument (Dietrich & Kracke, 2009). They indicated on a 6-point Likert scale (1 = *does not apply*, 6 = *fully applies*) to what extent they agreed with the statements given

in the Appendix. For each construct, the mean of the two items was computed⁵. The scores for ratings of maternal and paternal behaviors were highly correlated at both the within level and the between level. Mothers' and fathers' support correlated $r(\text{within}) = .69, p < .001$, and $r(\text{between}) = .57, p < .01$, and mothers' and fathers' interference correlated $r(\text{within}) = .55, p < .001$, and $r(\text{between}) = .72, p < .001$. The frequency of talks with mothers and fathers, respectively, correlated $r(\text{within}) = .69, p < .001$, and $r(\text{between}) = .56, p < .01$. The means of parent behaviors are depicted in Table 1.

Satisfaction with the transition progress. Participants indicated on a 6-point Likert scale (1 = *not at all satisfied*, 6 = *very satisfied*) to what extent they were satisfied with how they progressed with their transition during the previous week (1 item).

Analysis Strategy

We used multilevel modeling (time points nested in individuals) to disentangle the associations on the relationship level, i.e., parent-adolescent interactions across the situations (between-level), from the associations on the situation level, i.e., week-to-week fluctuations in parent-adolescent interactions (within-level). The proportions of variation due to either the adolescent-parent relations (between-individual variations) or the situations (within-individual variation) were examined by computing the intraclass correlations. These reflect the proportion of between-individual variance in the total variation that is observed for a given behavior.

To investigate the effect of the phase of application process on the situation-specific variation in youth and parent behaviors we created dummy variables (see Methods section). These variables were used as within-level predictors in regressions with exploration and parent involvement as outcomes. First, separate regression coefficients were obtained for the effect of each dummy (being in that phase) on the outcome variables. Next, we tested whether the differences in parameters were statistically significant. In doing so, two dummy variables at a time were entered as predictors of youth and parent outcomes. Differences between these parameters were tested by computing a new variable reflecting the difference between the unstandardized betas and testing it against zero.

Moreover, the extent to which youth and parent behaviors were linked was also examined on the between-level (that is, across situations) and on the within-level (individuals in particular situations). The same procedure was applied to examine the relations

⁵The correlations between the items were $r(\text{within}) = .29, p < .001$ and $r(\text{between}) = .04, p > .05$, for maternal support; $r(\text{within}) = .25, p < .01$, and $r(\text{between}) = .37, p < .10$ for paternal support; $r(\text{within}) = .18, p < .01$, and $r(\text{between}) = .29, p < .05$, for maternal interference, and $r(\text{within}) = .09, p > .05$, and $r(\text{between}) = .68, p < .001$, for paternal interference. Despite the fact that the correlations between the items of each scale were low to moderate, the results are reported for the scales instead of the single items. The results of analyses with the scales vs. the single items did not differ.

between youth and parent behaviors and youths' satisfaction with how their transition progresses. Because the relatively small sample limited the power on the between-level, we carried out separate analyses for each pair of variables.

We carried out all the analyses with the Mplus program (Muthen & Muthen, 1998-2008). We used the MLR estimator to obtain robust standard errors and applied the program's missing data option. This allowed using all available data for obtaining the model parameters without imputing data. All the models which are reported in the Results section are saturated models. As a result, all χ^2 -based model fit indexes indicate perfect fit and are, thus, not reported.

Results

As a first step, we investigated how many participants had two or more data points in each phase of the transition process. Of the 39 participants, $n = 25$ had at least two measurements in the sending phase, $n = 37$ had at least two measurements in the waiting phase, and $n = 28$ had at least two measurements in the receiving phase. Moreover, $n = 18$ participants had at least two measurements for the sending and the waiting phase, $n = 17$ for sending and receiving phase, and $n = 23$ for waiting and receiving phase. From $n = 15$ participants at least two measurement points were available in each phase of the application process.

Weekly Fluctuations and Variation Between Individuals and Families

Next, we examined the intraclass correlations for the major variables. As Table 1 shows, career exploration largely fluctuated across weeks, being evidenced in low intraclass correlations. Only 7-22% of the variation in exploration was due to the individual adolescents (variation between individuals across situations), the rest was due to situation (within-individual variation). However, variation between individuals was statistically significant for all these variables except in-breadth environmental exploration. By contrast, parental involvement was to a lesser extent subject to weekly fluctuations: 27-73% of the variation in the frequency of conversations, parental support and interference pertained to differences between adolescent-parent relations. Also adolescents' satisfaction with their transition progress fluctuated a lot across weeks. Only 23% of the variation in satisfaction was due to inter-individual differences, the rest, again, was due to situation.

Table 1. Descriptive Statistics and Adolescent and Parent Engagement During Different Phases of the Application Process (Standardized Regression Estimates on the Within-Level)

	Descriptive statistics			Phase in application process		
	ICC	Between-level variance	Mean	Sending	Waiting	Receiving
<i>Career exploration</i>						
Overall exploration	.14	.164**	1.86	.49***	-.16*	-.32***
In-breadth self	.07	.119*	1.62	.23**	-.04	-.18***
In-breadth environmental	.06	.146 ⁺	1.87	.44***	-.18**	-.24***
In-depth self	.22	.542**	1.77	.32***	-.07	-.24***
In-depth environmental	.13	.478**	2.24	.41***	-.19*	-.20**
<i>Frequency of conversations with parents</i>						
With mother ^a	.43	.691***	2.48	.34***	-.45***	.16*
With father ^b	.50	.665***	2.03	.09	-.29***	.24**
<i>Perceived parental career-related behaviors</i>						
Maternal support ^a	.27	.435***	3.15	.22**	-.29***	.07
Paternal support ^c	.51	.831***	2.69	.26**	-.26**	-.03
Maternal interference ^a	.51	.572**	1.74	.19*	-.22**	-.32
Paternal interference ^c	.73	.829*	1.60	.32*	-.16 ⁺	-.17*
Satisfaction	.23	.538***	4.19	–	–	–

Note. ^a*n* = 38. ^b*n* = 34. ^c*n* = 30.

*** *p* < .001. ** *p* < .01. * *p* < .05. ⁺*p* < .10.

Table 2. Concurrent Associations Between Career Exploration and Perceived Parental Involvement (Standardized Estimates)

	Mean	In-breadth exploration						In-depth exploration					
		Self		Environmental		Between		Self		Environmental		Between	
		Within	Between	Within	Between	Within	Between	Within	Between	Within	Between	Within	Between
<i>Frequency of conversations with parents</i>													
Mother	.36***	.12	-.65***	.07	-.03	.29***	-.44	.20*	.28 ⁺	.45***	.22		
Father	.23***	-.65***	-.84***	.05	-.84***	.15 ⁺	-.93 ⁺	.10*	-.39***	.28***	-.15		
<i>Perceived parental support</i>													
Mother	.27**	-.21	-.15	.03	-.13	.22*	-.26	.16*	-.05	.30**	-.28		
Father	.23*	-.15	-.15	.17	-.70*	.12	.04	.04	-.26	.31***	-.47		
<i>Perceived parental interference</i>													
Mother	.25**	.00	-.19	.11*	.14	.13	.76*	.15*	-.14	.28**	-.39*		
Father	.09	-.19	-.19	.03	-.27	-.01	.67**	.16*	-.28*	.16**	-.57**		

Note. *** $p < .001$. ** $p < .01$. * $p < .05$. ⁺ $p < .10$.

The results showed further that the weekly fluctuations in youth and parent behavior were predicted by the phase of the application process which participants were in at a given point in time (see Table 1). Adolescents showed significantly more than average exploration activity while sending applications. By contrast, they showed less than average exploration activity while waiting for and receiving replies. The differences in unstandardized coefficients ranged from $estimates = .482 - 1.558$ ($p = .063 - .001$) for differences between sending and waiting phase, and from $estimates = .751 - 1.705$ (all p 's $< .001$) for differences between sending and receiving phase. There was no significant difference in exploration activity between the waiting and receiving phase ($estimates = .147 - .392$, $p = .595 - .056$).

Moreover, participants had talked more than average to their mothers while sending applications and more to both parents when receiving letters of admission. They received higher than average levels of support and also interference in the sending phase, but not in the receiving phase. Waiting for replies was generally associated with less parental involvement (see Table 1). All differences between the sending and waiting phase were statistically significant ($estimates = .382 - 1.031$, $p = .028 - .001$). For maternal involvement, also the differences between the waiting and receiving phase were significant (marginally significant for interference, $estimates = -.239 - -.741$, $p = .070 - .001$). For paternal involvement, there were only significantly more conversations while adolescents received replies as compared to waiting ($estimate = -.594$, $p < .001$), while the amount of received paternal support and interference did not differ between the waiting and receiving phase ($estimates = .005 - -.300$, $p = .952 - .194$). Unfortunately, some suppression effects occurred for the comparison of parental involvement between the sending and receiving phase. Therefore, the difference scores obtained from these models are not reliable and hence are not reported⁶.

Associations Between Career Exploration and Perceived Parental Involvement

Next, we calculated associations between youth and parent behavior both within situations and within individual adolescents/adolescent-parent relations (see Table 2). The results showed that the more intensely adolescents had explored during a given week (as reflected in their overall score across the dimensions of exploration), the more they had talked to their parents, and the more supportive they perceived their parents in that situation. When taking a closer look at the types of exploration, the within-level results showed that there was no significant association with in-breadth self-exploration. Moreover, paternal support in a given week was only related to in-depth environmental

⁶In these models that included both the dummies for sending and receiving phase as predictors, the parameters for the receiving phase dummies were inflated. That is, they were increased in size as compared to the models in which they were included as single predictors, thus making the difference score unreliable.

exploration during that week. In addition, whereas maternal interference in a certain week significantly related to the overall exploration score, paternal interference did not. However, both parents' interference was associated with higher levels of the dimensions in-depth self- and environmental exploration.

At the between-level the results showed that those adolescents, who had explored more intensely during the transition period (i.e., across situations), had also talked less to their fathers. And, adolescents engaging more in in-breadth self exploration across situations also received less paternal support. This pattern was not found for mothers, with whom adolescents had talked more when they had engaged more in in-depth self exploration. With respect to interference the results showed differential associations differing by type of exploration. While both types of in-depth exploration related negatively to parental interference, there was a positive relationship with in-breadth environmental exploration.

Exploration, Parental Involvement and Satisfaction With the Transition Progress

Finally, we calculated correlations between adolescent and parent engagement and adolescents' satisfaction with how their transition progressed. The results (see Table 3) showed that the more youths had explored in a given week, the more satisfied they were in that situation. Also when parents were involved during a certain week (more frequent conversations, higher levels of support), this was related to elevated levels of situation-specific satisfaction. Finally, those adolescents who generally (across situations) had talked more to their fathers, showed marginal significantly more overall satisfaction while going through the transition.

Discussion

This study used a weekly diary intensive longitudinal design to examine the extent to which adolescent and parent engagement fluctuate from week to week, whether adolescent engagement is complemented by parental involvement, and whether youths' engagement and parents' involvement also contributes higher satisfaction with the choice process. The results showed that exploration largely fluctuated across weeks, whereas parent involvement was more stable. Family members' engagement varied according to the phase of the application process the adolescent was involved in. The more adolescents explored during a given week, the more they talked to their parents, and the more supportive parents were. Both exploration and support contributed to higher satisfaction.

First, we wanted to examine the extent to which adolescents' career exploration and parents' involvement varied from week to week during the transition from school to university. Results of multilevel modeling showed large week-to-week fluctuations in youths' engagement in career exploration. Only about 10-20% of the variance in career

Table 3. Associations Between Career Exploration, Perceived Parental Involvement, and Satisfaction With Transition Progress (Standardized Estimates)

	Satisfaction	
	<i>r</i> (within)	<i>r</i> (between)
<i>Career exploration</i>		
Overall exploration	.20***	-.24
In-breadth self	.11 ⁺	-.47
In-breadth environmental	.14*	-.55
In-depth self	.09*	-.11
In-depth environmental	.20***	.12
<i>Frequency of conversations with parents</i>		
Mother	.33***	.14
Father	.37***	.33 ⁺
<i>Perceived parental support</i>		
Mother	.28***	.26
Father	.30***	.33
<i>Perceived parental interference</i>		
Mother	.05	-.33
Father	.03	-.24

Note. *** $p < .001$. ** $p < .01$. * $p < .05$. ⁺ $p < .10$.

exploration could be explained by inter-individual differences. These results underscore that career exploration is a very situation-specific behavior (Gati & Asher, 2001).

Second, we tested the phase of application process as one possible source of situation-specific variation. The results showed that adolescents' exploration varied according to the phase of application. In line with our expectation, youths searched most information related to future studies in the beginning of the application process. Given the vast number of alternatives for one's college major choice (Galotti, 1999) exploration is needed as means to reduce the number of alternatives (Gati & Asher, 2001). However, in contrast to our expectation, we did not find elevated levels of exploratory activities while youths made their final choices. Even though it could be expected that particularly in-depth information is gathered and contemplated again there was no evidence indicating this in the data. Perhaps youths look for other kinds of information before making their final choice that were not captured by our diary instrument.

There was also considerable situation-specific variation in parental involvement. However, about 30-70% of the variance was due to differences between adolescent-parent dyads which indicates a more stable features of parent-child relations. Even though parental involvement was more stable across situations, it also varied according to the phase in the application process. The results corroborated our assumptions. Similar to adolescents' exploration, parents' involvement was higher during the sending phase, and lower while waiting for replies. Moreover, whereas adolescents reduced their engagement in exploration when receiving replies and making their final choice, the frequency of career-related conversations with parents increased again. These results indicate that parental other-regulation seems to be adapted and timed according to the situation of the adolescent (Sameroff, 2010). In particular when a decision has to be made youths consider their parents as partners, or in more theoretical terms, increase their initiative for involving their parents as supporters when they approach a deadline in a micro-cycle of goal striving (Heckhausen et al., 2010). Also parents may initiate conversations and offer opportunities to reflect and discuss the ongoing choice process more often. Regarding support and interference, we found that youths reported elevated levels of parental support and also interference particularly while sending applications. Parents may engage in these behaviors to motivate their children to engage actively in transition-related activities. By contrast, when adolescents made their final choices, we did not find a rise in perceived support and interference but in the frequency of transition-related conversations. Perhaps in this final phase of the decision-making process, parents rather function as adolescents' partners for reflection in making their final choice (Phillips, Christopher-Sisk, & Gravino, 2001). This was reflected in the increased frequency of transition-related conversations. In the phase of sending applications, however, when—apart from few early decided individuals—alternatives are generated (Gati & Asher, 2001), adolescent engagement might be most important and parental involvement in order to stimulate exploration might be most fruitful.

Third, we examined the links between parental involvement and adolescent exploration

in particular situations and across all situations. The results showed that parental involvement was higher in situations in which adolescents explored more intensely. This was not only true for the frequency of conversations and parental support, but also for interference. First, the within-level results consistently showed that the more youths had talked to their mothers and fathers during a given week, the more they had also engaged in in-breadth environmental and both forms of in-depth exploration during that week. These results, again, can be interpreted in two ways (cf. Nurmi, 2004): on the one hand, this could reflect adolescents seeking help from their parents (Heckhausen et al., 2010) and, for example, discuss with them the information they have gathered about college major options and places for studying. On the other hand, the conversations with parents might, in turn, stimulate the search for information. Second, the more adolescents had engaged in in-breadth environmental and both forms of in-depth exploration, the more support they reported to have received particularly from their mothers in a given situation. Fathers' situation-specific support was only related to in-depth environmental exploration. These results point to a more specific role of fathers' support, whereas mothers' support might be given and/or might be effective in different kinds of situations. Overall, the within-level results on parental support were in line with expectation and in accordance with previous research (e.g., Dietrich & Kracke, 2009; Kracke, 1997, 2002; Neuenschwander, 2008). Third, and partly contradicting our expectation, we also found positive associations between parental interference and exploration. Again, fathers' behavior seemed to be more situation-specific, which was reflected in the non-significant association with the overall exploration score. Taken together, both parents' interference during the interactions in a given week related to higher levels of in-depth exploration. In addition, the higher mothers' interference was in a specific situation, the more adolescents engaged in in-breadth exploration of the self. This latter finding is in line with the theoretical propositions of Luyckx and colleagues (2007) that parental over-controlling could lead to more ruminative forms of exploration. Also, mothers might react to this rather superficial form of exploration with pressuring their child towards more in-depth engagement. However, the assumption that interference would be unrelated or even negatively related to in-depth exploration (Luyckx et al., 2007), could not be confirmed on the within-level. It is possible that parental pressure stimulates exploration activities in certain situations. It has been shown that parents who are over-involved in their children's career choices often want to steer their offspring to pursue a specific career (Phillips et al., 2001). Parental pressure might therefore induce adolescents to explore that favored option or, on the other hand, work harder to find an alternative. This, however, is speculative and needs to be examined more deeply in further research.

Whereas the within-level results pertaining to the role of parental interference for exploration only partly corroborated our hypotheses, the between-level results were in line with expectation. Higher levels of interference in between-level analyses refer to a more stable aspect of the parent-adolescent relationship across situations, i.e., to parents who are in general more or less controlling. As anticipated, in families with higher levels

of parental interference, youths' engaged more in in-breadth environmental exploration, and less in in-depth exploration (Luyckx et al., 2007).

To summarize, whereas short-term pressure exerted by parents might stimulate adolescents to explore more intensely in a given situation, the negative role of interference seems to operate on the level of the relationship. In families characterized by parental pressure, this may go along with less favorable patterns of exploration. Further, when youths show more favorable patterns of exploration, parents might decrease their interfering. To confirm these interpretations, future research would benefit greatly from adopting a pattern- or person-oriented approach (Bergman & Magnusson, 1997) that will provide an option to explore the kinds of parent behavior that go along with different configurations of exploratory behaviors.

The between-level results also showed that in families, in which the adolescents had less frequent conversations with their fathers they explored a lot themselves. By contrast, those who had frequent conversations with their mothers showed higher levels of in-depth exploration related to self. With one exception we did not find that the average support the adolescents received was contingent upon their general level of engagement in exploration. Thus, parental support in fact might operate in specific situations: more support stimulating exploration and/or high support being elicited by adolescent activity.

Finally, we explored the role of youth and parent engagement for adolescents' satisfaction with the transition progress. Our results corroborated the assumption that when individuals are actively engaged in exploration, they reported higher satisfaction with the progress of the transition. This is in line with developmental theories of motivation which claim that goal pursuit contributes to higher well-being and satisfaction (e.g., Heckhausen et al., 2010; Nurmi, 2004; Salmela-Aro, 2009). However, this effect was evident only on the level of specific situations. More intensive exploration during a given week associated with higher levels of satisfaction. Yet being more engaged across situations was not reflected in generally higher levels of satisfaction which, again, underscores the fluctuating nature of exploration (Gati & Asher, 2001). Furthermore, in line with our hypotheses we found that the more adolescents and parents had career-related conversations during a certain week, and the more supportive parents were during these conversations, the higher was the adolescents' satisfaction. One possible explanation why interacting with parents contributes to satisfaction in the decision-making process has been provided by Heath and Gonzales (1995). When individuals who are up to make a decision talk to others about that decision, they are forced to organize and elaborate on their personal view and the pros and cons of certain choice alternatives. This, in turn, increases their confidence about their preferred choice and could also make them more satisfied with the process of decision-making. Similar results pertaining parent involvement and adolescent satisfaction have been obtained with regard to the early college years. For instance, more discussions with parents about university issues contributed to better well-being during the first weeks at college (Wintre & Yaffe, 2000), and parental support went along with satisfaction with one's studies (Chang et al., in press).

Limitations

The most obvious limitation of this study is its small sample size. It ranges around the lower boundary for the recommended number of level two units (Maas & Hox, 2005), thus limiting the power on the between level, and prevented us from analyzing more complex models with regard to inter-individual differences. For example, research in other areas of adolescent development has demonstrated the differential roles of mothers and fathers which might differ as a function of child's gender (Smetana, Campione-Barr, & Metzger, 2006). Such mother-daughter and father-son differences could not be examined with our sample that was comprised of only eight boys. Second, in this study we used adolescents' reports as sole data source and did not include parent ratings of their behavior. Although this research strategy reveals meaningful insights into how youths perceive their parents' role in deciding on a college major, examining joint developmental regulation would in fact require multi-informant data analyses (Dietrich & Kracke, in press). Third, the intensive design of this weekly diary study could have interfered with youths' naturally occurring exploration. That is, adolescents could have explored more because they participated in the study. After the end of the main diary data collection we asked our participants for feedback on how much they thought their participation had influenced their behavior during the transition (1 = *not at all*; 5 = *very much*). The reports of 29 adolescents who responded revealed that their participation had impacted to a small to medium extent how much they had engaged in transition-related activities ($M = 2.45$, $SD = 1.15$) and how much they had given attention to how they cope with the transition to university ($M = 2.17$, $SD = 1.23$). However, we found that the length of participation in this study was unrelated to exploration.

Future Prospects and Conclusions

This study gives rise to a number of questions to be addressed in future investigations which utilize diary methods in the domain of adolescent career development. The strengths of diary methods have been described in detail elsewhere (Bolger, Davis, & Rafaeli, 2003). Among them is the possibility to model intra-individual variability over time and assess situation-specific influences on behavior. This approach seems promising for the case of studying joint adolescent and parent developmental regulation as youths go through educational and career transitions. For example, in future investigations, it might be fruitful to detect individual differences in the trajectories of career exploration (i.e., a person-oriented approach; Bergman & Magnusson, 1997) and relate them to later outcomes. A research strategy including diary methods also enables researchers to examine the micro-level effects of varying contextual properties with regard to transitions within different educational systems. Moreover, even though this study was based on longitudinal data, it still employed a static data analytic approach (Lichtwarck-Aschoff et al., 2008). Going further, researchers can aim at examining nonlinear and dynamic

patterns of exploration and parent involvement, such as testing the existence of exploration cycles with in-breadth exploration preceding in-depth exploration (see also the discussion in Porfeli & Skorikov, 2010) and examining parents' role in this process. Dynamic systems methods (Lichtwarck-Aschoff et al., 2008) offer the statistical tools to answer this kind of research questions.

To conclude, this study demonstrated the potential benefits of taking a process perspective on adolescent career transitions and their related engagement as well as parental involvement. We showed that studying different behavioral levels yields useful pieces of information regarding individuals in specific situations as well as information about inter-individual and inter-family differences (Mroczek et al., 2003). Moreover, examining different facets of adolescent exploration separately revealed a specific relationship pattern that should be further explored in future research. Finally, the results showed that even though youth in their late adolescent years have gained a lot of autonomy (Kenyon & Koerner, 2009), and probably self-regulate most of their actions (Sameroff, 2010), parental involvement in the domain of making career-related choices is still of importance for them.

Study 5. Deciding on a College Major: Choice Trajectories, Exploration, and Later College Adjustment

Dietrich, J., Lichtwarck-Aschoff, A., & Kracke, B. (submitted). Deciding on a college major: Choice trajectories, exploration, and later college adjustment.

Abstract

In this weekly diary study over $M = 10.07$ weeks, we followed 33 adolescents through the transition from school to college and focused on the micro-level processes of commitment and exploration while youths decided on their college major. Later on, youths also reported on their college adjustment. We identified three choice trajectories: decided (youths who had committed themselves to one option early in the process and implemented their choice), narrowing (youths who narrowed down to one favorite option), and diffused (youths with low and changing commitments), and found meaningful differences in exploration and later college adjustment. Adolescents on the diffused trajectory explored particularly little in-depth information about their future studies and showed worse college adjustment than adolescents on the decided and narrowing trajectory.

Introduction

The transition to college imposes a major challenge for adolescents. Given the vast array of possible choices, adolescents must undertake the difficult task of forming commitments for their future career when approaching high school graduation. Starting with Marcia's (1966) work on identity statuses, a number of previous studies has shown that adolescents differ in their ability to make and implement firm commitments (e.g., Berzonsky, 1992). Since students in many European countries have to decide on their college major already before entering college, for them the issue of making occupational commitments becomes urgent right before going through relevant transitions, such as the transition to college. This study followed German students through that transition, from the application process until the end of the first semester. Based on theorizing on adolescent identity development (Kunnen, 2009; Luyckx, Goossens, Soenens, & Beyers, 2006), we supposed to find differences in career exploration and later college adjustment between adolescents depending on their 'choice trajectories' when being in the application process to college. While some youths were expected to have made their choices and commitments very early, others were expected to be in the midst of the decision process when approaching the deadlines for college admission. We classified youths in three choice trajectories which described their choice process during the admission procedure (decided youths, narrowers, and diffused). Adolescents were hypothesized, first, to differ in their engagement in career exploration during the observed period of the transition. Second, they were expected to differ in their subsequent adjustment to college, assessed at the end of the first semester. This study complements the existing literature in two ways. First, we focus on exploration processes on a week to week level, which has rarely been studied. Second, we fill a research gap by relating exploration and commitment in the final decision phase to outcomes after having made the transition to college.

Commitment and Exploration

Marcia (1966) described commitment and exploration as the core elements involved in forming an identity during adolescence. Whereas commitment refers to making relatively firm choices, e.g., about a future career, and engaging in implementation of these choices, exploration encompasses the process of seeking and processing information which informs such commitments. Career theorists have elaborated on these constructs with regard to career choice and have proposed that how adolescents cope with the decisional tasks of commitment and exploration has implications for the implementation of their career-related choices (see Germeijs & Verschueren, 2007, for an overview). For example, higher commitment and exploration have been hypothesized to impact the satisfaction with one's choice and later adjustment in the chosen option. However, as Germeijs and Verschueren already noted, there is a need for empirical studies which longitudinally test this hypothesis.

Most of the previous research on commitment and exploration has been conducted on Marcia's (1966) identity status model. In this model, Marcia distinguished four statuses along strong vs. weak commitment and high vs. low exploration. Youths with an achieved identity are high on both dimensions. Youths who are currently exploring, e.g., occupational options but have not yet committed themselves are in the moratorium status, while commitment without exploration is also possible, labeled foreclosed status. Youths who are neither exploring nor have made commitments are described as being in the diffused status. While researchers have attempted to verify developmental sequences of the four statuses (cf. Al-Owidha, Green, & Kroger, 2009), Marcia's original model focuses on the outcomes rather than the processes of identity work.

Further theorizing has thus been undertaken that puts more emphasis on the developmental trajectories or patterns of commitment and exploration. Marcia himself has elaborated on a trajectory called the MAMA cycle, in which states of achieved identity are followed by a moratorium, and again by an achievement in identity (Stephen, Fraser, & Marcia, 1992). Recently, Kunnen (2009) proposed an information-oriented trajectory (youths actively explore information before they commit to an option), a normative trajectory (youths form commitments based on the normative expectations of significant others instead of exploration), and a diffuse trajectory (youths avoid identity decisions as long as possible) in the process of identity formation (see also the identity style model, Berzonsky, 1992). The information-oriented trajectory is further divided in subtypes: According to the amount of identity conflict youths perceive (as reflected in commitment changes), they belong either to the gradual subtype with few conflict experiences, to the fluctuating subtype that shows a MAMA trajectory, or to the searchers subtype that is characterized by an enduring moratorium.

Another important refinement of Marcia's original theory is the dual cycle model of identity formation by Luyckx and colleagues (2006). The two cycles consist of exploration in-breadth and commitment making on the one hand (Marcia's paradigm), and exploration in-depth and identification with commitments on the other hand. Before commitments are made, exploration in-breadth is important in order to explore possible alternatives. After a commitment is made, exploration in-depth is important because it serves the strengthening or re-evaluation of existing commitments. In this sense the authors define identity formation as an iterative process of feedback loops and reciprocal cycles that influence one another (Luyckx et al., 2006).

Transitions as Triggers for Exploration and Commitment

An increasing body of research aims to examine the development of commitment and exploration within its proximal social and distant societal context (Bosma & Kunnen, 2008). Developmental theories of motivation offer a theoretical basis to describe how normative transitions, such as the transition to college, affect adolescents dealing with identity issues. For example, Heckhausen and colleagues (Heckhausen, Wrosch, & Schulz,

2010) and Nurmi (2004) have elaborated on what we call phase-adequate engagement. The tenor is that upcoming transitions in adolescents' lives trigger respective engagement, and that phase-adequate engagement pays off in terms of successful mastery of transitions and higher well-being (Heckhausen et al., 2010; Nurmi, 2004). In fact, there is evidence suggesting that exploration and commitment significantly increase when youths approach educational and career transitions (e.g., Germeijs & Verschueren, 2006), and that higher levels of these kinds of engagement have positive consequences for choice implementation (e.g., Germeijs & Verschueren, 2007; Kracke & Schmitt-Rodermund, 2001). Furthermore, Dietrich and colleagues (Dietrich, Kracke, & Nurmi, 2010) showed that adolescents who engaged in thorough exploration of the available options during the transition to college were more satisfied with how the transition progressed.

In the tracked German educational system, in which this study was conducted, students who graduate from upper secondary school are eligible to go to college. After finishing high school, about 60 percent of students directly continue their education, of which 40 percent directly enter college studies, and about 20 percent enter vocational education (Federal Ministry of Education and Research, 2007). Unlike in the United States, for example, German students apply for a particular subject instead of a particular college. This requires having made commitments to one's college major before entering college. In this study, the focus was on those youths who plan to move directly from high school to college. Typically, applications are sent during summer, and studies begin in fall.

Choice Trajectories and Their Implications for Exploration and College Adjustment

Despite the fact that Marcia's model has inspired a large body of research within the area of identity development, the field still lacks knowledge about the micro-level processes (i.e., day to day or week to week) that are involved in changes and the development of identity (Lichtwarck-Aschoff, van Geert, Bosma, & Kunnen, 2008). This paucity of knowledge is related to the fact that the vast majority of research addresses identity processes over large periods of time (e.g., several months or years). These research approaches reflect aggregated views on identity formation. Though useful in some respect, they do not provide information on ongoing processes of change at an individual level. This study contributes to the literature by investigating processes of commitment and exploration as they unfold within individuals over short periods of time, that is, from week to week. Using the same data as in this study, Dietrich and colleagues (2010) already demonstrated that career exploration during the transition to college is highly fluctuating from week to week. Adding onto this, we expect to find individual differences in the trajectories of how adolescents come to their decision on a college major when only little time is left until a decision has to be made. Admission deadlines function as a trigger for commitment and exploration. However, adolescents differ in the extent to

which their decision-making for a college major has progressed.

Hirschi and Lage's (2007) six-phase model of career decision-making provides a useful basis for conceptualizing the choice process during the transition to college. The authors proposed that the choice process occurs in a series of six phases: (1) becoming concerned about career choice, (2) generating possible alternatives, (3) reducing the alternatives, (4) deciding among few options, (5) establishing a commitment to the chosen option, and (6) being decided and firmly committed to one's choice. Exploration in-breadth is predominant in the first phases of the process; exploration in-depth is predominant in the later phases (Hirschi & Lage, 2007). Applied to the transition process to college, the six-phase model implies that some youths can be expected to have already made their choices and commitments, while others can be assumed to be in the midst of the decision process when approaching the deadlines for college admission. The undecided adolescents can be further divided into those who have a favorite option in mind, and those who have not. Thus, in line with Hirschi and Lage (2007) there are three possible groups which resemble different choice trajectories in the application process to college: a decided trajectory, a narrowing trajectory, and a diffused trajectory. Adolescents in different trajectory groups were assumed to differ, first, in their overall mean levels of studying-related career exploration in-breadth and in-depth during the admission process to college, second, in the week to week mean changes of their exploration (increase vs. decrease), and third, in the week to week stability vs. variability of exploration. Moreover, we expected to find differences between youths in different choice trajectories in terms of college adjustment after having entered college.

(1) The *decided trajectory* is characterized by strong commitments. Youths in this group have decided on a preferred alternative and eventually implement this choice (Hirschi & Lage, 2007). No alternatives to the preferred subject are prominent in this late phase of decision-making and youths are certain to enter into their preferred subject. Having completed the commitment formation cycle (Luyckx et al., 2006), decided youths were expected to show low and stable levels of exploration in-breadth, i.e., no mean change was expected. Levels and week to week variability of in-depth exploration were expected to be lower than in the other two trajectory groups, but higher than their own level and variability of exploration in-breadth (e.g., Luyckx, Goossens, Soenens, Beyers, & Vansteenkiste, 2005). Moreover, previous research has shown that having made firm commitments associates with active coping and benefits adolescents' well-being, regardless of whether commitments are based on previous explorations or not (e.g., Kunnen, Sappa, van Geert, & Bonica, 2008; Luyckx et al., 2005; Vleioras & Bosma, 2005). Accordingly, decided youths were expected to exhibit a better adjustment to college, as assessed by satisfaction with studies, perceived fit, drop-out intentions, and studying-related self-efficacy, than youths on the diffused trajectory.

(2) The *narrowing trajectory* is characterized by a crystallization process (Hirschi & Lage, 2007) in which one preferred alternative is selected from a pool of several alternatives and is eventually implemented. During the process, the chosen alternative

has always been the favorite option. However, youths on the narrowing trajectory are somewhat delayed in their decision-making as they form a strong commitment to one option just shortly before facing a deadline. The narrowing trajectory describes individuals in the last part of a MAMA cycle from moratorium to achieved (Stephen et al., 1992), or from prescreening and in-depth exploration to choice (Gati & Asher, 2001). It resembles the fluctuating information-oriented trajectory in Kunnen (2009). Accordingly, we expected higher week to week variability in exploration within adolescents of the narrowing group than within adolescents of the decided group. Similar to decided youths, adolescents in the narrowing trajectory group were hypothesized to show lower levels of in-breadth as compared to in-depth exploration (Gati & Asher, 2001). In-depth exploration activities were assumed to be highest in this group which is still involved in active decision-making (Hirschi & Lage, 2007). In addition, whereas exploration in-breadth was anticipated to decrease across time, exploration in-depth was expected to increase (Gati & Asher, 2001). Because of the similarity between the narrowing trajectory and the information-oriented trajectory in terms of their commitment to an alternative (Berzonsky, 1992; Kunnen, 2009), youths in this group were hypothesized to show better adjustment to college than diffused youths (Berzonsky & Kuk, 2000; Kunnen et al., 2008; Nurmi, Berzonsky, Tammi, & Kinney, 1997).

(3) The *diffused trajectory* is characterized by generally weak commitments and a shift in commitment to one favorite option (cf. Kunnen et al., 2008). That is, the favorite option changes during this late phase of decision-making, and an alternative is chosen which has not been the initial favorite. Exploration levels were expected to be low (e.g., Kunnen, 2009). Since diffused youths can be assumed to be most affected by contextual cues (Flum & Blustein, 2000), they were expected to be most strongly deadline oriented. The pressure to make a decision is inevitable at this point. Thus, according to Heckhausen et al. (2010) an increase in mean levels of both exploration in-breadth and in-depth can be assumed. On the other hand, since diffused youths' exploration likely is subject to more or less random contextual cues which trigger the search for study-related information (Flum & Blustein, 2000), it is also possible to find no systematic mean change in exploration over time. In the same vein, adolescents in the diffused trajectory group were hypothesized to show the highest week to week variability in exploration as compared to the other groups. In this group we do not expect to find differences between in-breadth and in-depth exploration. Previous research has shown that diffused adolescents are particularly prone to maladjustment (Berzonsky, 1992; Berzonsky & Kuk, 2000; Kunnen, 2009; Kunnen et al., 2008; Nurmi et al., 1997). Therefore, in terms of college adjustment we anticipated youths on the diffused trajectory to be worst off after the first semester at college.

Method

Sample and Procedure

The sample consisted of German adolescents attending higher track schools who were recruited from an ongoing longitudinal panel study. A total of 46 students agreed to participate in a weekly diary study that would follow them until enrolment into one major (see Dietrich et al., 2010, for more details). For the current analyses, only those participants were included who had not dropped out during the diary assessment period and who had completed at least four weeks of data collection in order to arrive at time lines of reasonable length. For that reason, 13 cases had to be removed from the sample. The final sample consisted of 33 adolescents (27 female, 6 male) aged 17-18 years. Compared to the other potential diary participants in the panel study (youths who had indicated planning an immediate transition to college, $n = 142$ out of $N = 232$), the actual 33 diary participants did not differ in terms of gender, career exploration nor decisional status (i.e., being decided vs. being undecided about one's future career path).

During the application process to college participants filled in standardized weekly diaries in an online assessment procedure. The diary period ended when a person had enrolled at a college, or when he or she had eventually decided not to enter college for the next winter term but instead decided to do something else (e.g., jobbing or traveling). Participants were contacted again at the end of their first semester at college the next spring for the follow up assessment. The length of time lines ranged from 4 to 14 weeks¹ in the diary period ($M = 10.07$, $SD = 2.43$). At the end of the diary period 32 adolescents had eventually enrolled at a college, and one participant had ended up working. Thirty participants completed the follow up.

Measures

Diary Measures

Description of the application process. In each week, students named up to three majors they were currently considering entering. For each major they indicated how certain they were that they would enter this major (range 0-100). Moreover, students reported on the applications they sent, on the admissions they received, and on the subject and the college in which they eventually had enrolled. This information was used to classify youths into trajectory groups.

¹One participant completed 21 weekly assessments. Of this time line, only the last 14 time points were included in the current analyses (see the analysis strategy section for more detail on centering of time lines). A length of 14 time points equals the length of the next longest time line. This was done to be able to include this outlier in the group level analyses in the same way as the other participants.

Career exploration. Participants indicated on a 6-point Likert scale (1 = *not at all*, 6 = *very intensively*) how intensively they had engaged in career exploration in-breadth and in-depth (2 items each covering exploration related to self and to the environment). For item wordings see Dietrich et al. (2010). The mean of the two items at each time point was computed for each exploration dimension.

Follow Up Measures

Participants indicated on a 6-point Likert scale (1 = *does not apply*, 6 = *fully applies*) to what extent the following statements were true of them.

Satisfaction with studies. Participants rated how satisfied they were with their current studies (Nagy, 2007; 3 items, e.g., “All in all I am satisfied with my current studies”). Cronbach’s alpha for this scale was .78.

Perceived fit. Participants rated how congruent their current studies were to their interests and expectations (Bergmann, 1998; 2 items, e.g., “My current studies fully fit my interests”). Cronbach’s alpha was .89.

Drop-out intention. Participants indicated how strong was their intention to quit their current studies (Nagy, 2007; 3 items, e.g., “I have thought about quitting my studies”). Cronbach’s alpha was .83.

Studying-related self-efficacy. Participants rated the extent to which they were confident to successfully progress with their studies and to overcome possible obstacles (Jerusalem & Schwarzer, 1986; 5 items, e.g., “I am confident that I will successfully complete my studies”). Cronbach’s alpha was .82.

Analysis Strategy

Adolescents were classified by the first author in one of the three trajectory groups according to the following criteria in a qualitative procedure. All adolescents could be assigned to one of the groups. Youths were assigned to the decided trajectory, if they named only one option as their preferred college major during the whole diary period of which they were completely certain they would enter it, and if they eventually enrolled into this major. Youths were assigned to the narrowing trajectory, if they named, among several other options, one preferred college major and eventually enrolled into this major. The eventually chosen major was the favorite option throughout the entire diary period, and adolescents had continuously reported the highest certainty levels for it. Last, youths were assigned to the diffused trajectory, if their preferred major changed during the diary period, i.e., if the option with the highest certainty levels was a different major

at different points in time, and if youths eventually chose a major which was not the initially preferred one.

In the following, we describe a few issues concerning our small sample and the interdependence in our data. Simulations and resampling techniques, such as Monte Carlo analyses, are appropriate for small samples. They are parameter free and allow for the testing of any specific null hypotheses (cf. Todman & Dugard, 2001). We applied a non-parametric permutation test (Todman & Dugard, 2001) for testing differences in means, mean changes (linear slopes) and standard deviations (week to week variability) between the trajectory groups as well as for testing the mean changes (linear slopes) themselves against zero (see, for a similar procedure, Steenbeek and van Geert, 2007). We tested against the null hypothesis that no statistical difference exists between adolescents from different trajectory groups and between different time points within one adolescent. Accordingly, this null hypothesis assumed that instead of distinct distributions for each of the trajectory groups only one underlying distribution existed. In other words, according to the null hypothesis, the assignment of a particular adolescent to one of the trajectory groups as well as the order of time points within each adolescent is arbitrary. We tested the null hypothesis by randomly rearranging the adolescents over the three trajectory groups and the time points within each adolescent. For each random rearrangement (permutation), we calculated the desired parameter (e.g., mean difference between the groups). Next, we counted the number of times that the random permutation produced a parameter which was at least as large as the observed parameter. Finally, dividing this number by the number of times the permutation had been carried out (1000 times) yielded an exact p -value.

Results

Classification of the adolescents to one of the three choice trajectories yielded the following distribution of groups. In the decided trajectory group were 17 youths, in the narrowing group were 9 youths, and in the diffused group were 7 youths. In the follow up at the end of the first semester, one adolescent had dropped out in each the decided group and the narrowing group. Naturally, no data on college adjustment was obtained from the participant who had ended up working.

In the following, we describe first the results for the group level with respect to differences between the trajectory groups in exploration during the diary period. The analyses on the group level were based on aggregated data for each time point. Before aggregating data, we assigned each adolescent's last time point (the final decision) as the zero point (see Figure 1). This was done because the final decision is the common temporal marker for all individuals. Next, we computed the means of exploration in-breadth and in-depth for each time point over all adolescents in each trajectory group. From the aggregated data, we computed an overall group mean as well as a least-squares linear slope. After

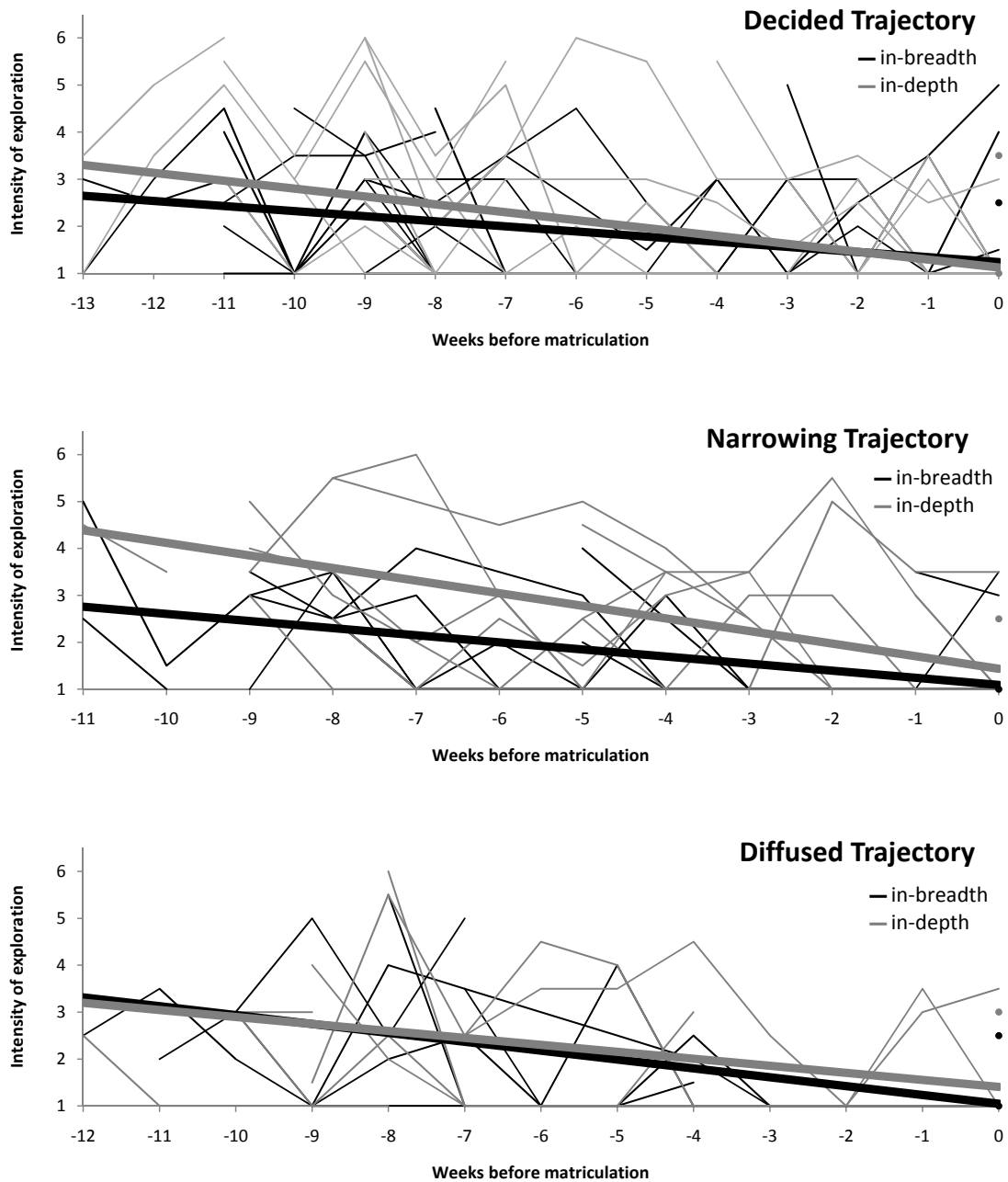


Figure 1. Individual-level week to week changes (observed and least-squares mean linear slope) for the decided trajectory, the narrowing trajectory, and the diffused trajectory. The black lines depict changes in exploration in-breadth; the gray lines depict changes in exploration in-depth. Lines are broken at missing data points. Dots at time 0 represent data points for individuals for whom data at time -1 was missing.

Table 1. Descriptive Group Level and Individual Level Statistics for Exploration In-Breadth and In-Depth (Means, Linear Slopes, and Standard Deviation on the Individual Level)

	Group level		Individual level		
	M	Slope	M	SD	Slope
<i>Decided trajectory (n = 17)</i>					
In-breadth	1.86	-.10***	1.67	.90	-.11***
In-depth	2.29	-.19***	1.79	.92	-.17***
<i>Narrowing trajectory (n = 9)</i>					
In-breadth	1.83	-.17***	1.70	.94	-.15***
In-depth	2.74	-.23***	2.51	1.39	-.27***
<i>Diffused trajectory (n = 7)</i>					
In-breadth	1.88	-.16***	1.80	1.10	-.19***
In-depth	2.04	-.08 ⁺	2.00	1.26	-.15**

Note. Stars indicate whether a slope was significantly different from zero.

*** $p < .001$. ** $p < .01$. * $p < .05$. ⁺ $p < .10$.

presenting the group level results, we report the respective results for the individual level. For these analyses we computed the individual mean, standard deviation, and least-squares linear slope for each person first. Subsequently, we computed the mean from the individual parameters over the adolescents in each trajectory group. Since the length of time lines differed between adolescents, it is possible that the group-level and the individual-level analyses yield different results and, therefore, are both reported. Last, we report the results on differences in later college adjustment by comparing the means between the three trajectory groups.

Group-Level Results on Exploration

The group-level results, as depicted in Table 1, showed that the trajectory groups did not differ from each other in their mean intensity of in-breadth exploration. All three groups showed a significant decline in exploration in-breadth (all $ps < .001$) which was less strong in decided than in narrowing youths ($p = .023$). Concerning in-depth exploration, the means differed by group, such that adolescents on the narrowing trajectory explored significantly more in-depth than adolescents on the decided ($p = .026$) or the diffused trajectory ($p = .004$), while the latter two groups did not differ significantly from each other. Exploration in-depth decreased significantly on the decided trajectory ($p < .001$) and on the narrowing trajectory ($p < .001$), but did not change in the diffused trajectory. Differences in the slopes of exploration in-depth were significant between the

diffused and the decided ($difference = .11, p = .029$) and between the diffused and the narrowing group ($difference = .15, p = .009$) with diffused adolescents showing the flat-test trajectory. Last, the mean level results within groups revealed that both the decided ($p = .004$) and the narrowing youths ($p < .001$) explored more in-depth than in-breadth information. No differences between mean levels of exploration in-breadth and in-depth were observed within the diffused trajectory.

Individual-Level Results on Exploration

The results of the mean comparisons on the individual level generally mirrored the group level results (see Table 1). That is, no differences in exploration in-breadth were found between the groups. And, adolescents on the narrowing trajectory explored significantly more in-depth than adolescents on the decided ($p < .001$) or the diffused trajectory ($p = .026$), while the latter two groups did not differ in their mean levels. Moreover, youths on the narrowing trajectory explored more in-depth than in-breadth ($p < .001$), whereas no such difference was found in the decided or the diffused trajectory. Similar to the group level, exploration in-breadth showed a decline within all trajectory groups (all $ps < .001$). This decline was stronger in the diffused trajectory than in the decided trajectory ($difference = .08, p = .034$)². Exploration in-depth also decreased during the diary period, and on the individual level this decline was found to be significant for the diffused group as well ($p = .002$; decided and narrowing groups $ps < .001$). Adolescents on the narrowing trajectory showed the strongest decrease of in-depth exploration, whilst the slopes of the other two groups did not differ (decided vs. narrowing: $difference = .10, p = .040$; diffused vs. narrowing: $difference = .12, p = .044$). With respect to intraindividual variability the results showed higher variability for adolescents on the narrowing ($p = .001$) and the diffused trajectory ($p = .019$) as compared to adolescents on the decided trajectory. Figure 1 shows the observed individual trajectories and the estimated mean slopes for each trajectory group.

Predicting Differences in College Adjustment

The follow up results showed that adolescents on the decided trajectory and on the narrowing trajectory exhibited high levels of college adjustment, such that they were highly satisfied with their studies and that they perceived a high fit between their studies and their interests and expectations, respectively (see Table 2). Further, adolescents in both the decided and the narrowing trajectory group had weak intentions to quit studies. Youths in the decided and the narrowing trajectory group did not differ significantly in terms of satisfaction with studies, perceived fit and drop-out intentions. In contrast to the first two trajectory groups, the diffused group showed significantly worse adjustment to

²Such a difference was also found descriptively on the group level, but failed to reach statistical significance ($difference = .06, p = .085$).

Table 2. Group Means for the College Adjustment Measures

Trajectory group	Satisfaction	Perceived fit	Drop-out intentions	Self-efficacy
<i>Decided trajectory (n = 15)</i>	5.05 ^a	5.07 ^c	1.48 ^e	3.91 ^g
<i>Narrowing trajectory (n = 8)</i>	5.25 ^a	4.81 ^c	1.88 ^e	3.03 ^h
<i>Diffused trajectory (n = 7)</i>	4.29 ^b	3.21 ^d	3.29 ^f	3.29 ^{g,h}

Note. Means in one column sharing a common subscript are not statistically different.

college. Diffused adolescents were less satisfied with their studies ($p = .015$ vs. decided, $p = .022$ vs. narrowing), perceived less fit ($p = .003$ vs. decided, $p = .001$ vs. narrowing), and had stronger drop-out intentions than adolescents in the decided ($p = .023$) or the narrowing trajectory group ($p = .006$). With respect to studying-related self-efficacy the results revealed a significant difference between the decided and the narrowing group ($p = .035$), such that youths in the decided group had higher levels of self-efficacy than youths in the narrowing group. Diffused adolescents neither differed in their self-efficacy from decided youths nor from narrowing youths.

Discussion

This weekly diary study employed a micro-level perspective on adolescents' commitment and exploration during the application process to college. Based on the course of adolescents' decision process for a college major, we classified them in one of three choice trajectories: decided, narrowing, or diffused. Adolescents were also followed until the end of the first semester, and differences between the choice trajectories in college adjustment were examined.

The results showed, first, that while the majority of adolescents had already committed themselves to one major in the last phase of the decision process (decided trajectory), there was a considerable amount of youths who showed a late crystallization towards one option (narrowing trajectory), and who had weak and changing commitments (diffused trajectory).

We then examined how adolescents in one trajectory group differed from youths in other groups in their mean levels, mean level changes, and week to week variability of studying-related career exploration in-breadth and in-depth. The results revealed great similarities between trajectory groups for exploration in-breadth. First, we found low and decreasing levels of exploration in-breadth in all three choice trajectories. While this finding was in line with expectation for the narrowing and decided trajectory, it contradicted our assumption for diffused youths. Even though diffused adolescents did not have strong commitments at the start of the application process, and despite the

urgency of making a college major decision, they did not seem to explore a range of alternative choices. This finding contradicted our hypothesis that diffused youths in particular would increase their transition-related engagement in times of urgency (Heckhausen et al., 2010). By contrast, diffused youths decreased their in-breadth exploration before matriculation even stronger than decided youths. Second, adolescents on the narrowing and the diffused trajectory did not show higher levels of week to week variability in this type of exploration as decided adolescents, thus also disconfirming our hypotheses. The great similarities between the trajectories can be explained within Gati and Asher's (2001) model of career-decision making which suggests—rather than exploration in-breadth—exploration in-depth to be the core adaptive behavior right before making career-related choices.

Indeed, levels and variability of exploration in-depth differed by group. As expected, adolescents on the narrowing trajectory explored most in-depth information, thus confirming the conceptual closeness of this trajectory to the last part of a MAMA cycle (Stephen et al., 1992) and the fluctuating information-oriented trajectory (Kunnen, 2009). And, exploration in-depth was higher than exploration in-breadth in this group, as reflected in the mean level scores. A similar result was also observed for the decided trajectory, although only on the group level. This, again, corroborated our assumptions that those youths have completed the commitment formation cycle (Luyckx et al., 2006) and engage more in in-depth exploration (Hirschi & Lage, 2007), for example about specific universities, before entering their preferred subject. Even though we found a decline instead of an increase in exploration in-depth for the narrowing trajectory, their course of exploration is still indicative of Gati and Asher's (2001) prescreening–in-depth exploration–choice sequence. It might well be possible that exploration in-depth had its peak before our study started, or during the beginning of data collection. During the course of the study, exploration in-depth then showed the same decline as within decided youths, but on a higher mean level. Furthermore, in line with our expectation we found higher week to week variability in adolescents on the narrowing and the diffused trajectory than on the decided trajectory, although this variability gives rise to different interpretations. In the narrowing trajectory group, high variability of exploration in-depth corresponded with high levels of it, and with a crystallization of a commitment to one favorite option. Youths on the narrowing trajectory can thus be characterized as fluctuating information-oriented (Kunnen, 2009). In the diffused trajectory group, on the other hand, high variability of exploration in-depth corresponded with low levels of it and unstable commitments. Thus, this high variability may resemble more non-systematic (low) exploration activities, probably triggered by more or less random contextual cues (Flum & Blustein, 2000).

To summarize, exploration in-depth showed distinct patterns in the different groups which were in line with our hypotheses, whereas exploration in-breadth was very similar in all choice trajectories. Interestingly, both forms of exploration uniformly showed a decrease over time that was not predicted by theory. Further research would benefit

greatly from examining exploration and commitment over a longer period of time before making the final college major choice. This would also allow disentangling adolescents on an information-oriented trajectory from adolescents on a normative trajectory in the decided group (cf. Kunnen, 2009) which was not possible on the basis of our data.

Last, we examined differences in college adjustment between adolescents in the three trajectory groups after having entered college. As predicted, adolescents on the diffused trajectory showed significantly worse adjustment to college in terms of satisfaction and perceived fit with the chosen major as well as drop-out intentions. These results resemble those on adjustment found in previous research (Berzonsky & Kuk, 2000; Kracke & Schmitt-Rodermund, 2001; Nurmi et al., 1997) and complement them by a micro-level view on individual processes (cf. Kunnen, 2009). Our results demonstrate longitudinally that, when adolescents deal with the task of choosing a college major in a way characterized by low and changing commitments and exploration, they are likely to make non-optimal choices (Germeijs & Verschueren, 2007). On the other hand, when adolescents arrive at firm commitments they are better adjusted to college right after having entered college (e.g., Luyckx et al., 2005). However, it is still possible that those youths who adopted their commitment from external sources (i.e., youths on a normative trajectory; Kunnen, 2009) experience a mismatch with their choice later on. This can be expected because a lack of career exploration has been suggested to result in less congruent career choices (see Kracke & Schmitt-Rodermund, 2001). Since we could not differentiate between normatively oriented and information-oriented adolescents in our data, the above assumption merits further investigation.

In contrast to satisfaction and perceived fit with studies and drop-out intentions, the results on studying-related self-efficacy did not show the above pattern. Whereas adolescents on the decided trajectory had significantly higher levels of self-efficacy than adolescents in the narrowing trajectory, diffused adolescents differed from neither group in this respect. Several possibilities exist that could explain this result. First, self-efficacy could be a trait-like person characteristic (Bandura, 1997) that is not systematically affected by commitment and exploration. For example, the decided trajectory could comprise of individuals with high levels of generalized self-efficacy which applies to both studying-related efficacy and career decision-making efficacy. Thus, the same trait that made those adolescents make early choices (as proposed by social cognitive career theory, Lent, Brown, & Hackett, 1994), made them feel more efficacious regarding their studies. In the same vein, adolescents on the narrowing trajectory could have delayed career decision-making because they had a low decision-making self-efficacy which, later on, was related to low efficacy regarding their studies. Second, the result that adolescents in the diffused trajectory did not differ from adolescents in the other choice trajectories could be due to different groups of diffused individuals. Luyckx and colleagues (2005) unraveled diffused youths with low and high levels of adjustment, labeling the resulting profiles diffused diffusion and carefree diffusion, respectively. Both groups are characterized by low levels of commitment and exploration. But while the diffused diffusion profile

goes along with low levels of adjustment (e.g., high depression and low self-esteem), the carefree diffusion profile exhibits normal levels of adjustment. One could speculate that the results on studying-related self-efficacy were driven by 'carefree' adolescents. That is, those youths possibly did not like their studies very much (which was reflected in the other adjustment scores) but, on the other hand, they did not care. Since adolescents might not have attached high importance to studying, their studies might not have represented a central aspect of their self and therefore did not affect their self-efficacy levels.

Limitations and Directions for Future Research

This study has several limitations that have implications for future research. First, the small sample size of this study limits the statistical generalizability of our results to the population of adolescents at the transition to college. However, our study focused on how individual trajectories develop over time, and resampling techniques allowed for appropriate statistical analyses of this data (see Todman & Dugard, 2001). Small samples and even individual cases can be fruitfully used to test theoretical predictions (e.g., Flyvberg, 2006). The aim of such studies is rather theoretical generalizability than statistical sample-based generalizability. Hence, even though research with intensive longitudinal designs almost automatically results in small sample sizes, such studies help to understand the underlying processes of development.

This study is a first step in the examination of the processes involved in the transition from school to university. A next step would entail studying the mechanisms which drive development during these transition periods. For example, in the diffused trajectory group it could be interesting to investigate what relates to the fluctuations in adolescents' exploration. That is, what are the environmental conditions or cues which trigger exploration (Flum & Blustein, 2000)? Dynamic systems methods (Lichtwarck-Aschoff et al., 2008) offer the methodological tools to answer this kind of research questions.

Second, future research should aim to further differentiate possible trajectory groups. One starting point could be discerning adolescents on an information-oriented trajectory from those on a normative trajectory (Berzonsky, 1992; Kunnen, 2009) in the group of decided individuals. Another point could be distinguishing adolescents with carefree vs. diffused diffusion (Luyckx et al., 2005). Moreover, our sample did not comprise those youths who have low commitments but do not enter college. It would be interesting to focus on the weakly committed adolescents who fail to make a decision in times of urgency or who make a different choice than entering college. Such a differential research strategy would entail in-depth understanding of individual trajectories of commitment and exploration as well as their correlates and consequences in youths facing a career transition.

Third, our results were obtained within one educational system with its peculiarities, e.g., adolescents decided on their major before entering college. To generalize the

theoretical conclusions drawn here it seems warranted to examine trajectories of commitment and exploration in educational systems in which college major choice is made after youths enter college, as is the case in the U.S. educational system.

To summarize, the major gain of this study is that it revealed insights into the developmental processes of commitment and exploration while adolescents go through a major transition in their lives. It further gives hints for the design of future research for the investigation of micro-level processes and mechanisms involved in identity development in adolescence and engagement during transitions.

Part III. General Discussion

During a career intervention session at an Erfurt high school:

Me: "Now let's talk about the people in your social context who could possibly help you with career issues. How can your parents, for example be helpful for your career choice or in the transition from school to apprenticeship or college?"

Student, 10th grade: "They kick my butt and bring me back on track when I delay career issues for too long."

What parents do with respect to their children's career choice, and how youths perceive and appraise that can have various forms. In this thesis, I examined how some particular behaviors of parents interact with their children's engagement related to career. As the example above illustrates, it is possible to get unexpected answers to one's (research) questions.

The final part of this thesis first summarizes the major results of the five studies conducted¹. Following that, I draw some general conclusions with respect to the theories outlined in Part I. After having discussed some limitations of the present studies I elaborate on and provide new hypotheses for future research on the topic of adolescents' and parents' developmental regulation.

Summary of the Present Research Results

The main objectives of this thesis were related to the questions of (1) how adolescents' and parents' developmental regulation interact, and (2) whether there are benefits of their regulation. Adolescents' regulation was captured as career exploration, commitment and decision-making, and goal processes. Parents' regulation was captured as support, interference, and lack of engagement. In this section, I will discuss the main results of the studies 1 to 5 according to the four research questions outlined in the introduction.

Research Question 1: How do actual processes of phase-adequate engagement look like at the transition to college?

Although there is a vast body of literature on exploration and commitment in adolescence, previous research has largely neglected the processes which operate at the micro-level of development (for an exception see Kerpelman, Pittman, & Lamke, 1997). This is particularly the case in the career domain. The results of the diary study are thus special because they are the first findings pertaining career exploration and commitment during a transition. These results demonstrated that career exploration is highly fluctuating

¹To acknowledge the work of my co-authors, I use the editorial "we" in this section.

from week to week (study 4), which had been hypothesized (e.g., Gati & Asher, 2001) but not been tested empirically. Moreover, as predicted by theory (e.g., Kunnen, 2009), the results showed that there are three groups of youths with different developmental trajectories of commitment (study 5): a decided group which had made decisions early and did not need much further exploration, a narrowing group which finalized their decision right at the transition and thus explored a lot in-depth (Hirschi & Lage, 2007), and a diffused group which did not have a clear favorite option but in spite of changing commitments, and in spite of the urgency to make a decision, did not explore (Kunnen, 2009). In sum, the diary results point to a lot of variability both between youths and within individuals. Both kinds of variability can fruitfully be studied in this depth with intensive longitudinal designs.

Research Question 2: How is parental career-related involvement best to be conceptualized?

Study 1 served to examine the psychometric properties of the PCB scales. The results confirmed that the PCB is a valid and reliable instrument for capturing adolescents' perceptions of parents' career-related support, interference, and lack of engagement. We were able to replicate the factorial structure in samples of Turkish (Kracke, Gure, & Dietrich, 2008) and Mexican adolescents (Komes, Dietrich, Kracke, & Hernandez-Guzman, 2010). In these samples, we also found similar correlational patterns among the scales.

In more homogeneous samples of higher track (late) adolescents we found perceived support and lack of engagement to be highly negatively correlated (Dietrich, 2008; study 2 and 3). Correlations obtained with structural equation modeling were up to $r = -.80$. Furthermore, lack of engagement was very infrequent. For these reasons, study 3 and 4 focused on support and interference. However, support and lack of engagement turned out to be distinct in heterogeneous samples with respect to educational track (Dietrich & Kracke, 2009; Kracke et al., 2008; Komes et al., 2010) and in samples with adolescents attending lower track schools (K. Mayhack, personal communication, October 25, 2010).

In Germany, the school track an adolescent attends is highly associated with his or her parents' socioeconomic status (e.g., Gresch, Baumert, Maaz, 2009; Wagner, Helmke, & Schrader, 2009). Research in other areas of development has shown that effects of parenting practices are moderated by parents' socioeconomic status, such that, for example, high levels of autonomy granting and parents' non-involvement in adolescents' lives can be detrimental for low SES youths but beneficial for high SES youths (see Beveridge & Berg, 2007). Thus, examining lack of engagement might be more important to consider in samples of youths in the lower educational track, whereas its importance for adolescents at the transition to college seems limited.

In the parent version of the PCB it was possible to reliably assess parents' views on

their support and interference (study 3)². Correlations between adolescent and parent ratings were medium to high for support but low for interference (study 2 and 3) which resembles previous findings with cross-informant ratings of parent behavior (e.g., Tein, Roosa, & Michaels, 1994). The parent version of the PCB has recently also been applied in a sample of parents of lower track German youths (K. Mayhack, personal communication, October 25, 2010) and proved satisfactory with respect to reliability of the three scales (including lack of engagement).

Moreover, we found meaningful correlations between parental career-related behaviors and parenting styles (according to the model by Barber, Stolz, & Olson, 2005) for both the adolescent and the parent version (study 3). This finding gives further hints on the convergent validity of the PCB. Support and warmth, and interference and psychological control were moderately related, which demonstrated their similarity, but also their uniqueness (cf. Darling & Steinberg, 1993).

In the future, the PCB might be extended by another type of parental involvement. Recently, Berg and her colleagues (Beveridge & Berg, 2007; Meegan & Berg, 2001; Berg, Wiebe, Beveridge, et al., 2007) introduced the concept of parent-adolescent collaboration, that is, adolescents and parents work together on a developmental goal they both share. Collaboration means the frequent participation of adolescent and parent in interactions that are characterized by teamwork, negotiation, brainstorming, or collaborative problem-solving (Beveridge & Berg, 2007). Collaboration is conceptually different from support (Berg et al., 2007). While a goal does not need to be shared for parents' support to occur, collaboration occurs only when parent and adolescent jointly work on the same goal (see Young and colleagues' idea of joint projects, Young et al., 2001).

Research Question 3: How are adolescents' phase-adequate engagement and parents' involvement associated?

Studies 1 to 4 examined associations between adolescents' and parents' career-related engagement. Additionally, studies 2 and 3 explored the role of beliefs for youths' and parents' regulation behaviors. This paragraph is structured around the parent behaviors examined in this thesis.

Support. Positive associations between parents' career support and different aspects of adolescents' exploration of career-related information (overall exploration, in-breadth exploration, in-depth exploration, and planful exploration strategies) were found in all studies included in this thesis. These associations were found on macro-level ("snapshots" of year to year development, study 1-3) as well as on the micro-level (week to week development, study 4), and in the reports of all family members. The results resemble

²In the interference scale, however, one item had to be deleted which was not parallel with the adolescent version and thus needs to be revised, see appendix. In contrast to the adolescent version, the parent version of the lack of engagement scale did not show satisfactory reliability scores.

previous findings (e.g., Kracke, 1997, 2002; Neuenschwander, 2008) and extend them by a differentiated perspective which revealed that support associates with various facets of adolescent exploration. Moreover, we presented first evidence to suggest both directions of influence as hypothesized by several scholars (e.g., Nurmi, 2004; Sameroff, 2010; Young et al., 2001).

The results further showed that also a negative relationship between parental support and adolescent engagement is possible when the way youths pursue transition-related goals is focused (study 2). The more adolescents were engaged in goals regarding the upcoming transition to college or vocational training, the less support they received from their mothers. This could imply that the more youths are able to self-regulate their transition-related engagement, the less support they might need (Sameroff, 2010). But why did support show positive associations with exploration and negative associations with goal engagement? This effect might be due to different levels of abstraction. Whereas exploration pertains to concrete activities of searching information, the transition-related goals participants named were broader and had a longer time perspective (e.g., “get into medical school”). Thus, the better youths cope with these general transition-related goal themselves, the less support they need. Yet, support might be given for specific activities as well as in specific situation (see also the results of study 4). In sum, this finding illustrates that exploration and goal pursuit are similar but different facets of phase-adequate engagement. However, before final conclusions can be drawn regarding goal processes, replication of the findings is needed.

Interference. The results on interference, first of all, underscored the importance of assessing different facets of adolescent career exploration. While we did not find an association between parents’ interference and a composite measure of youths’ exploration (study 1), the results based on a differentiated measure of exploration showed a different picture.

As expected, when interference was higher, youths acted less planful and systematic when exploring career-related information, that is, they were less likely to compare different sources of information or thought less about both the pros and the cons of a given occupational option (study 3). This finding can be explained with the identity style theory (Berzonsky, 1992). Our construct of planful exploration is similar to the information-oriented identity style. Recently, Smits and colleagues (Smits, Soenens, Luyckx, et al., 2010) argued that controlling parenting hinders the development of an information-oriented style, because it does not grant the autonomy needed to explore independently (see also the tenets of self-determination theory, Ryan & Deci, 2000). On the other hand, youths’ non-systematic exploration also predicted interference in our data (study 3). That is, less planful exploration might also cause parents to react with pressure to make their child explore in a more systematic way.

Furthermore, the results revealed positive associations between interference and in-

breadth exploration (study 3 & 4). This is line with Luyckx and colleagues' assumptions (2007). The authors suggested, first, that adolescents might experience anxiety and indecision as a consequence of parental pressure (see also Guerra & Braungart-Rieker, 1999; Lopez & Andrews, 1987). Indeed, the interference-indecision link was confirmed by our results (study 1). Indecision and anxiety, in turn, are assumed to contribute to more ruminative forms of exploration, that is, in-breadth exploration of many possible (occupational) options (Luyckx et al., 2007). This hypothesis received support particularly on the macro-level of development (study 3 & 4). On the other hand, it has been proposed that parental interference is a reaction to either adolescents' passivity in preparing for an upcoming transition or their inability to commit to a career goal (Luyckx et al., 2007). Similar to Luyckx and colleagues, we did not find support for this assumption on the macro level (no respective predictions could be made for interference in study 3). However, this explanation is still possible for the macro-level associations found in the diary data (study 4).

A different situation was hypothesized for the link between interference and in-depth exploration. Unlike in-breadth exploration, in-depth exploration means the thorough search of information which pertains already existing commitments (Luyckx, Goossens, Soenens, & Beyers, 2006; Meeus, Iedema, & Maassen, 2002; Porfeli & Skorikov, 2010). This type of exploration was assumed to be less likely influenced by parental pressure and controlling (Luyckx et al., 2007). However, different and mixed results were obtained in our studies. On the macro-level, the results obtained from a single measurement point unexpectedly revealed a positive association (study 3; see also Crocetti, Rubini, & Meeus, 2008; Smits, Soenens, Luyckx, Duriez, Berzonsky, & Goossens, 2008), whereas the assumed negative relationship was found when the macro-level was defined as an aggregation of behavior over several weekly assessments (study 4). Future research needs to clarify whether these diverging results were due to the different designs of the studies or rather reflect a different role of interference in different phases of a transition (before graduation vs. in the application process to university).

Moreover, a positive association between interference and exploration in-depth was also found on the micro-level (from week to week, study 4). Although unexpected, the positive links between interference and exploration can, again, be explained with Berzonsky's (1992) identity style model. A normative identity exploration style has been found to be related to controlling parenting (Smits et al., 2010). That is, youths in our studies who experienced parental pressure to consider their favorite alternative might indeed have explored those options in order to comply with parents' wishes. On the other hand, youths might have sought more information on their own preferred alternative in order to convince their parents of their choice when parents were too controlling. Or, as in the example of the 10th grader in the beginning of this chapter, parental interference might just keep youths focused on the current career task which manifests in exploration of either kind, in-breadth and in-depth. Since the present studies did not address the motivation behind youths' exploration, the above explanation remains speculative.

Lack of engagement. Although very few scholars had addressed a lack of parental engagement regarding career previously (for exceptions see Chope, 2005; Mortimer, Zimmer-Gembeck, Holmes, & Shanahan, 2002; Oechsle, Maschetzke, Rosowski, & Knauf, 2002), lacking engagement has been considered to reduce adolescents' progress in career development (Mortimer et al., 2002). Accordingly, we found a small association with career indecision (study 1). That is, the less engaged parents were in their children's career issues, the more decision problems youths reported. Similarly, Dietrich and Salmela-Aro (2010) found in a sample of late adolescents that parents' lack of engagement negatively predicted youths' subsequent pursuit of career-related personal goals. The less engaged parents were while youths were still in high school, the less importance adolescents placed on pursuing goals related to career. To sum up, some adolescents and their parents might both attribute little importance to the career task. One could speculate that this constellation produces a diffused identity in the adolescents (Marcia, 1966), and that those youths are particularly prone to make suboptimal career transitions (see the results of study 5). More research on this often neglected aspect is clearly needed.

Transition-related beliefs. Parents' confidence beliefs about youths' transition-management related positively to exploration, even though this was not always reflected in adolescents' views (study 2 & 3). This suggests, first, that parents' beliefs might be accurately built on the basis of adolescents' behavior (Jussim, 1991). Second, beliefs possibly have the potential to influence youths' engagement (e.g., Eccles, 1994; Pomerantz, Moorman, & Litwack, 2007). Moreover, transition-related beliefs also related to interference in mothers. Given the assumption that these beliefs accurately reflect youths' more or less adaptive dealing with a transition, these beliefs could elicit mothers' worries, and, in turn, their interference (see Pomerantz & Eaton, 2001, for a similar idea). Thus, particularly within the views of parents, transition-related beliefs could be a mechanism through which adolescents affect their parents.

Research Question 4: Do the intensities of and the associations between adolescents' and parents' developmental regulation depend on temporal and process characteristics related to a transition?

Two kinds of process characteristics were examined in this thesis: (1) the transition phase, i.e., being in a non-urgent or in an urgent phase of a transition (Heckhausen et al., 2010), and (2) decisional status/degree of commitment, i.e., the degree to which one is decided or committed to a particular option for one's future career path (Heckhausen, Wrosch, & Schulz, 2010; Luyckx et al., 2006). Their impact on adolescent and parent co-development was explored on both developmental levels, i.e., the macro-level and the micro-level. In the following, the results will be discussed sequentially for youths' exploration, parents' career-related involvement, and for the associations between exploration and involvement.

Exploration. Adolescents' career exploration proved to be phase-sensitive to deadlines on the macro- and the micro-level (Heckhausen et al., 2010). While adolescents were still in school, higher levels of exploration in-depth were found when youths' were in the urgent phase of a transition than when they had a moratorium year, for example, due to military service (study 3). During the transition to college, higher weekly levels of all kinds of career exploration were found when adolescents were in a phase of sending their college applications (study 4).

Moreover, at the edge of graduation from high school, adolescents explored more in-depth and more systematically when they were already decided about their next career step (study 3) (Gollwitzer, 1990; Luyckx et al., 2006). Later on, during the application to college, highest levels of exploration in-depth were found in adolescents who were in the process of narrowing down to one favorite option, while decided adolescents had decreased their in-depth exploration again (study 5) (Hirschi & Lage, 2007). Exploration in-depth thus might have a peak around the point when a decision is made (Savickas, 2005). However, individual differences in decision-making also turned out to be important (study 5). Adolescents with low and changing commitments explored particularly little career-related information, even when being confronted with the imminent need to make a decision. Thus, urgency did not affect those adolescents.

Parent involvement. The results further revealed that particularly mothers provided more support in the urgent phase of a transition (study 3). Moreover, during the application process to college, parents' micro-level involvement was generally higher (more transition-related conversations, more support, and more interference) when youths were sending out their applications which mirrored the results for adolescent exploration (study 4). Additionally, there were, again, more transition-related conversations with parents when youths made their final decision about enrolment. These findings point to the adaptivity of parent involvement to the temporal constraints of a transition (Nurmi, 2001; Sameroff, 2010).

Associations between exploration and parent involvement. In line with our expectation, links between support and exploration were generally stronger when adolescents were in an urgent phase of the transition, and when they had not yet committed themselves to one option for future career (study 3). One could argue that these are situations in which support is particularly needed and sought (Heckhausen et al., 2010; Sameroff, 2010). Similarly, the positive association between interference and in-breadth exploration as well as the negative association with planful exploration strategies were stronger in the urgent transition phase (study 3). Both less systematical and rather broad exploration might elicit parental interference particularly in times of urgency, thus leading to higher associations.

On the other hand, process characteristics moderated the relationship between interference and exploration in-depth in a different way than was assumed. That is, the

positive link between interference and in-depth exploration was stronger in a non-urgent transition phase, and in decided adolescents. This finding, again, underscored the interpretation that the positive relationship was driven by youths with a normative identity style (Smits et al., 2010) who commit themselves early to a career goal, possibly even when a transition is not in sight.

The results on how process characteristics moderate the relationship between adolescents' and parents' regulation are, so far, limited to the macro-level of development. Transferring this to the micro-level seems a fruitful approach for detecting mechanisms underlying self- and other-regulation.

Research Question 5: What are the benefits of phase-adequate self-regulation and other-regulation?

Benefits of adolescents' regulation. The diary study revealed benefits of how adolescents re-regulated their decision-making for a college major on a micro-level, which, to my knowledge, has not been reported previously. The results showed, first, that higher levels of all kinds of exploration during the process of applying for college were associated with higher levels of satisfaction with the progress in this process (study 4). Whereas previous research had demonstrated relationships of goal engagement and satisfaction in general (Schindler & Tomasik, 2010), our results provide the first evidence to suggest such benefits concerning career exploration. Second, the results revealed that forming strong commitments for one major, combined with higher levels of exploration, predicted better adjustment later in college (study 5). This finding extends the scarce empirical evidence on benefits of exploration and commitment making (Germeijs & Verschueren, 2007; Kracke & Schmitt-Rodermund, 2001) by a view on the processes possibly underlying the previously found associations.

Benefits of parents' other-regulation. The diary study revealed direct benefits of parental involvement for adolescents' satisfaction with the transition process. That is, the more often adolescents and parents talked about career, and the higher parents' support was, the more satisfied the adolescents were with the progress of their transition (study 4). Interference was unrelated to satisfaction. These findings, again, extend previous results on potential benefits of parents' involvement for adolescents' satisfaction (Chang et al., in press) by a micro-level perspective on the process of college major choice. Additional research is needed which addresses long-term benefits of parents' involvement. For example, Schindler and colleagues (Schindler, Dietrich, & Berg, 2010) found support for the potential benefits of generally involving familiar and knowledgeable close others when making one's college major choice. However, benefits of parents' other-regulation comprise not only the direct effects of parents' involvement on process and transition outcomes. In fact, the facilitating function of parents' other-regulation for adolescents' self-regulation can obviously be seen as a benefit as well.

Limitations

The present studies have several strengths, but also some weaknesses. As the limitations of each study were discussed in detail in each of the chapters in Part II, this section only summarizes some main points and addresses those not discussed previously.

Limitations of the Macro-Level Studies

First, the presented studies predominantly relied on cross-sectional data. Longitudinal studies with identical measurement of the given constructs over time are clearly needed to replicate the findings of our studies. These studies would allow for stronger conclusions regarding the direction of effects. They could also incorporate the process characteristics in the examination of longitudinal trajectories. For example, one could test the assumption that getting into an urgent phase has always the same effect on adolescents' regulation. That means, do youths who have a year off after high school graduation increase their transition-related behaviors later on when they plan to move on to the next step of education?

Second, other types of adolescents' phase-adequate engagement, such as processes of setting and pursuing goals (e.g., Little, 1983), and other types of parent involvement, such as collaboration between parents and adolescents (Meegan & Berg, 2001) deserve further research. This will be useful for generalizing on the general principles of career-related co-development outlined in Part I.

Third, other transitions need to be studied. With the present studies we cannot answer the question of whether the same processes are at work in younger adolescents, or youths in other educational tracks. German youths in the lower track, for example, who are younger when graduating from high school, could need more other-regulation (cf. Sameroff, 2010). Those youths, either because of their age or because of their educational level, might have lower capacities for self-regulating a transition. Accordingly, benefits from supportive other-regulation, or negative effects of lacking engagement, for example, could be more pronounced in those adolescents.

Fourth, assessing the motives behind phase-adequate engagement would help to clarify the mechanisms underlying parents' influence on adolescent' engagement (Smits et al., 2010). In particular, examining the motives behind exploration could help explain the positive link found between interference and exploration in-depth.

Limitations of the Micro-Level (Diary) Studies

First, small sample sizes like ours are common with diary studies, particularly over longer periods of time (cf. Lichtwarck-Aschoff et al., 2010; Schindler & Tomasik, 2010) and are one of the drawbacks of the diary approach. Highly committed participants are needed who stay motivated for keeping diaries. This does not only makes such

studies expensive, but also keeps a certain kind of people involved in data collection by the risk of a selective dropout. Although we did not find differences between diary participants and non-participants in the variables of interest, it is still likely to have a selective sample. Moreover, that participants reported (small) effects of participations onto their perception of the behavior during the transition points to the study as having some characteristics of an intervention (see, for example, Perels, Gurtler, & Schmitz, 2005). That means that frequent assessment of one's behavior likely triggers monitoring processes and higher awareness for one's situation. This, in turn, might have influenced our results to some extent.

Second, only adolescent diary data were analyzed. Even though we tried to get data from the parents, it turned out that motivating them is even more difficult. Thus, we did not get enough parent data ($n = 19$ mothers and $n = 10$ fathers) to conduct multi-informant analyses.

Third, the number of time points was relatively small. This hindered us, for instance, from conducting dynamic data analysis (Lavelli, Pantoja, Hsu, Messinger, & Fogel, 2005).

Fourth, the sample size limited the possibilities to appropriately probe the reliability of the diary measures (Hox & Kleiboer, 2007). Only a rough estimate could be obtained for the career exploration measures. However, the fact that the fluctuations in exploration and parent involvement could be predicted systematically by situational variables is an indication for the reliability of the measures.

Conclusion

The major contribution of this dissertation can be described as follows. First, three facets of parents' career-specific involvement have been established to capture parental other-regulation: support, interference, and lack of engagement. An extension by a fourth facet, collaboration, seems a fruitful avenue for future research. Second, the facets of involvement are similar to the respective dimensions of parenting styles (according to the model by Barber et al., 2005), but proved to be distinct constructs (cf. Darling & Steinberg, 1993). Third, empirical support was found for the assumption that parents' involvement is adapted to the situation of the adolescent (as suggested by Nurmi, 2001, and Sameroff, 2010). This underscores the usefulness of the self- and other-regulation approach for describing and explaining adolescent and parent co-development at career transitions. Fourth, first evidence was presented to suggest both directions of influence—parents influencing adolescents, but also adolescents influencing parents (Nurmi, 2004; Sameroff, 2010; Young et al., 2001)—although replication of the results within longitudinal studies is definitely needed. Fifth, the studies add to the small body of existing literature concerning some scarcely studied features of career exploration and commitment. This thesis demonstrated the situational variability of exploration on a

macro- and a micro-level of development. Moreover, the finding that commitment and exploration benefit the transition process as well as more long-term transition outcomes is a unique empirical contribution to the literature. In this respect, the particular value of the diary data is their potential to provide insights at the individual level as well as the micro-level of development (Lavelli et al., 2005).

To summarize, the development of appropriate measures made it possible to start testing theoretical assumptions and answering research questions concerning adolescent-parent co-development at the macro- and the micro-level of development: Is other-regulation through parents adapted to the situation of the adolescent? Is the relationship between adolescents' self-regulation and parents' other-regulation bidirectional? Is parents' other-regulation meaningfully related to general parenting? This thesis presented empirical evidence to give first positive answers to these questions. Going further, the empirical results provide a basis for future research that focuses on possible mechanisms underlying co-development on the micro-level and further examines the micro-level and macro-level outcomes of developmental regulation. An example of how such research could conceptually look like is elaborated in the final section.

Future Directions: On Processes and Mechanisms

In the final section, I will elaborate on how the results obtained with the present studies could inform future research on adolescents' and parents' developmental regulation. My suggestions will center around two main issues which are rooted in a dynamic view on development (Granic & Patterson, 2003; van Geert & Steenbeck, 2005; Lichtwarck-Aschoff et al., 2008). These main issues concern questions of how the macro-level and the micro-level of development interact, and what could be possible mechanisms on the micro-level that drive macro-level development (and vice versa).

Interactions of the Macro- and the Micro-Level of Development

Developmental goals defined by adolescents' internal reflections of current developmental tasks (Heckhausen et al., 2010) can be described as higher order goals on the macro-level of development (Carver & Scheier, 1990). Developmental goals affect the (micro-level) goals youths (and parents) set and the actions they undertake in their everyday lives (e.g., Cantor, Norem, Langston, et al., 1991). Similarly, general characteristics of the parent-adolescent relationship affect the specific interactions in particular situations (e.g., Darling & Steinberg, 1993; Granic, Dishion, & Hollenstein, 2003). Macro-level entities thus function as a constraint for everyday behaviors (e.g., Granic & Patterson, 2003). That is, for example, having a certain macro-level transition-related goal can be assumed to make those (micro-level) behaviors more likely which are related to an upcoming transition and thus serve the attainment of the developmental goal. This

process, in fact, applies equally to adolescents and parents. It can take place with or without their conscious awareness (Custers & Aarts, 2010; Gestsdottir & Lerner, 2008).

In turn, according to dynamic systems theory (cf. Lichtwarck-Aschoff et al., 2008), self- and other-regulation on the micro-level of development can be assumed to have consequences for the attainment of the macro-level developmental goals (Haken, 1999). Long-term progress with developmental goals thus emerges out of successive short-term interactions. Applied to adolescents during the transition to college, the coupling of exploration and involvement on the micro-level might contribute to long-term progress with the macro-level transition-related goal of becoming clear about one's preferences for a college major.

Combining both time levels in one theoretical model has at least two advantages. First, such a model acknowledges that different processes might be at work on different levels of analyses (Lichtwarck-Aschoff et al., 2008). Second, such a model is able to shed light on the processes and mechanisms which drive development (Lavelli et al., 2005). It explains how developmental outcomes on the macro-level, such as having made a commitment or attaining one's self-set goals, come about.

Micro-Level Processes and Mechanisms in Adolescents' and Parents' Developmental Regulation

This section gives some suggestions on how the micro-level processes involved in career-related co-development could look like. As the focus of this thesis was on exploration as one indicator of adolescents' developmental regulation, the proposed mechanisms will center around associations between exploration and parents' career-related behaviors. Since youths *and* parents are involved as actors, I describe possible mechanisms separately for both of them. The described processes follow an approach related to control theory and test-operate-test-exit cycles (for an overview see Austin & Vancouver, 1996) which has already been applied to identity development by Kerpelman and colleagues (1997). Briefly said, both approaches assert that individuals test for discrepancies between the goals they have (desired states) and their current situation (current states). Action is undertaken, when the test reveals a negative difference between the two (cf. Austin & Vancouver, 1996). How this mechanism might work within parents and within youths is described in detail below.

Mechanisms within parents. According to the approach outlined above, parents might carry out tests which compare their child's behavior to a standard they hold concerning this particular behavior or developmental state (Kerpelman et al., 1997). These standards can be high or low. They are based, for example, on parents' developmental goals for the child (Granic et al., 2003). Depending on the test and its outcome, at least three possible pathways can be anticipated which lead to certain career-specific parental behavior. Certainly other pathways are also possible. (1) The test ends with a positive

evaluation, that is, the parent's developmental standard is met by the adolescent. Therefore, no action is undertaken. (2) The test ends with a negative evaluation indicating a mismatch of the adolescent's current state and the parent's standard. However, parents could observe positive changes in youths' behavior—that is, changes towards approaching parents' standard—such that the adolescent actively engages in transition-related activities. In this scenario, support or collaboration are likely to occur (see Granic et al., 2003, for a similar argumentation). On the other hand, there could be no progress towards parents' standard, or even negative change, for example, because an adolescent engages increasingly less in transition-related activities but rather hangs out with her friends. In this scenario, parents might start to worry and engage in interference (cf. Pomerantz & Eaton, 2001). (3) Last, it is also possible that parents do not carry out a test at all, e.g., because they do not have a career-related developmental goal for their child, or this goal is of negligible importance for parents (Oechsle et al., 2002; Maschetzke, 2009). In this case, parental lack of engagement is likely to occur.

Mechanisms within adolescents. In the following, I first describe possible mechanisms for the occurrence of exploration in-breadth and in-depth, before I elaborate on how exploration could be related to parental behaviors³. Again, the concept of tests and operations is used in the description of the mechanisms.

In line with the exploration in-breadth vs. in-depth distinction (Luyckx et al., 2006), two kinds of tests can be assumed: (1) a *diversity test* in the exploration in-breadth cycle vs. (2) a *specificity test* in the exploration in-depth cycle. Again, various scenarios can be anticipated. (1a) In the first scenario, an adolescent carries out the diversity test which yields a negative evaluation, indicating that screening a variety of different career options is warranted. Consequently, exploration in-breadth is initiated. (1b) The diversity test yields a positive result when the adolescent has collected sufficient in-breadth information. Thus, she forms initial commitments (Luyckx et al., 2006), and possibly moves on to the exploration in-depth cycle by carrying out a specificity test (cf. Gati & Asher, 2001; Savickas, 2005). (2a) Like in the case of the diversity test, a negative specificity test result makes the adolescent start exploring in-depth. (2b) A positive result in the specificity test has several possible consequences. The adolescent might strengthen the identification with a given commitment (Luyckx et al., 2006). Further, she might make a final decision concerning a future career path (Gati & Asher, 2001) and might take action for implementation of her choice (Hirschi & Lage, 2007; Savickas, 2005). Or, she might reconsider a previously made commitment (Crocetti et al., 2008), for example, because the in-depth exploration process yielded new information which signals her a mismatch between a certain option (e.g. college major) and her strengths, weaknesses, and goals. This reconsideration, again, might lead to exploration in-breadth (Crocetti

³It is, of course, possible to elaborate on other types of adolescents' phase-adequate engagement in a similar manner.

et al. 2008).

It is also possible that neither of the tests, or just one of them, is carried out by youths. The former might be the case if youths do not emphasize developmental goals concerning the career task and avoid related choices as long as possible (Berzonsky, 1992; Savickas, 2005). No exploration is carried out and no strong commitments are made, possibly even when adolescents face a career transition (see study 5).

Viewed separately, when adolescents do not carry out the diversity test, it can be assumed that no exploration in-breadth occurs which might lead to a conferred commitment (Marcia, 1966). That is, a commitment is adopted from external sources. However, this does not exclude the possibility that this conferred commitment is explored in-depth (see the results of studies 3 & 4, and Flum & Blustein, 2000). On the other hand, when adolescents do not carry out the specificity test, it can be expected that no in-depth exploration occurs, and superficial commitments are made (Kunnen, 2009; Savickas, 2002).

Finally, based on the empirical results of this thesis, I will now briefly describe how different parental behaviors can trigger the exploration mechanisms described above⁴. First, a lack of parental engagement regarding career might result in adolescent passivity: Neither the diversity test nor the specificity test are carried out (see earlier sections in this chapter). Second, as suggested by the results of study 3 and 4, parents' support might lead to both tests. This effect could be even stronger for parent-adolescent collaboration (see the argumentation of Berg, Meegan, & Deviney, 1998). Third, the role of parental interference might depend on which kind of parental standard is tackled. On the one hand, parents might steer their child in a certain direction regarding future career ("I want you to become a lawyer!"). When youths normatively adopt this commitment, this process might trigger the specificity test. Flum and Blustein (2000) explained that exploration can be triggered by extrinsic motives of, for example, winning the approval of parents. In the case of parents' steering, exploring in-depth—which serves the strengthening of the conferred commitment—might be a good strategy to show compliance with parents' wishes (see also the results of study 3). On the other hand, parents might pressure their child to engage more in the career task ("It's about time that you find out what you want!"). This pressure might make both exploration cycles likely, as reflected in the results of study 3 and 4. As discussed in earlier sections (and echoed in the introductory example at the beginning of this chapter), interference of this kind might keep youths "on track".

Many additional pathways can, of course, be imagined. By integrating the empirical findings of this thesis with a dynamic systems view on development, this final section had the aim of demonstrating the utility of the self- and other-regulation approach for

⁴The main focus here is on how parental behaviors trigger the tests of diversity and specificity. In addition, parental behaviors possibly interact with the exploration process itself.

studying the mechanisms involved in adolescents' and parents' developmental regulation at career transitions. The example made clear that theory which makes specific predictions is needed if one aims to examine the mechanisms of co-development at the micro-level. The major contribution of this thesis is the fact that its results provide a basis to formulate some specific hypotheses on the many open questions to be tested in future research.

Appendix

Appendix A

Original Item Wordings of the Adolescent and the Parent Version of the PCB in German (revised 2009)

Support

1. Meine Mutter/mein Vater ermuntert mich, Informationen ueber Studienfaecher und Berufe zu suchen, die mich interessieren.
Ich ermuntere mein Kind, Informationen ueber Studienfaecher und Berufe zu suchen, fuer die es sich interessiert.
2. Meine Mutter/mein Vater macht mich auf verschiedene Studien- oder Berufsmoeglichkeiten aufmerksam.
Ich mache mein Kind auf verschiedene Studien- oder Berufsmoeglichkeiten aufmerksam.
3. Meine Mutter/mein Vater spricht mit mir ueber die Chancen, in verschiedenen Studienfaechern bzw. Ausbildungsberufen einen Platz zu bekommen.
Ich spreche mit meinem Kind ueber die Chancen, in verschiedenen Studienfaechern bzw. Ausbildungsberufen einen Platz zu bekommen.
4. Meine Mutter/mein Vater spricht mit mir ueber meine Interessen und Faehigkeiten in Bezug auf mein zukuenftiges Studium oder meinen Beruf.
Ich spreche mit meinem Kind ueber seine Interessen und Faehigkeiten in Bezug auf sein zukuenftiges Studium oder seinen Beruf.
5. Meine Mutter/mein Vater hilft mir bei der Suche eines geeigneten Studiums bzw. einer Ausbildung.
Ich helfe meinem Kind bei der Suche eines geeigneten Studiums bzw. einer Ausbildung.

Interference

1. Meine Mutter/mein Vater hat klare Vorstellungen ueber mein zukuenftiges Studium bzw. Beruf und versucht, mich entsprechend zu beeinflussen.
Ich versuche, meinem Kind solche beruflichen Plaene nahezulegen, die ich fuer angemessen halte.
2. Meine Mutter/mein Vater versucht, ihre Wuensche fuer meinen Beruf bzw. mein Studium durchzusetzen.
Ich versuche mein Kind zu ueberreden, die Studienfaecher bzw. Berufe in Betracht zu ziehen, die ich mir fuer ihn/sie wuenschen wuerde.

3. Meine Mutter/mein Vater wuerde mir ein Studienfach oder einen Beruf ausreden, der ihr nicht gefaellt.
Ich wuerde meinem Kind ein Studienfach oder einen Beruf ausreden, den ich fuer ihn/sie nicht gut finde.
4. Meine Mutter/mein Vater versucht, mich in eine bestimmte Richtung zu draengen, was mein zukuenftiges Studium / meinen zukuenftigen Beruf angeht.
Ich versuche mein Kind davon zu ueberzeugen, eine Berufs- oder Studienrichtung einzuschlagen, die ich mir gut fuer ihn/sie vorstellen kann.
5. Meine Mutter/mein Vater mischt sich zu viel in die Wahl meines Studiums/ Berufs ein.
Ich muss meinem Kind manchmal ein bisschen Druck machen, damit es sich mit seiner Berufswahl beschaeftigt.*

* Dieses Item wurde nicht in die Analysen zu Studie 3 einbezogen.

Lack of Engagement

1. Meine Mutter/mein Vater ist kaum in meine Berufswahl involviert.
Ich bin in die Berufswahl meines Kindes kaum involviert.
2. Meine Mutter/mein Vater kann mir bei der Studien- und Berufswahl kaum helfen, weil sie zu viel Stress hat.
Ich kann meinem Kind bei der Studien- und Berufswahl wenig helfen, weil ich beruflich sehr viel Stress habe.
3. Meine Mutter/mein Vater kuemmert sich kaum um meine Studien- und Berufswahl.
Ich mische mich kaum in die Studien- und Berufswahl meines Kindes ein.
4. Meine Mutter/mein Vater kann mir bei der Studien- und Berufswahl kaum helfen, weil sie selbst Schwierigkeiten im Beruf hat.
Ich kann meinem Kind bei der Studien- und Berufswahl meist wenig helfen, weil ich in meinem Beruf stark beansprucht bin.
5. Meine Mutter/mein Vater kann mir bei der Berufswahl kaum helfen, weil sie nur wenig ueber verschiedene Studienfaecher bzw. Berufe weiss.
Ich kann meinem Kind bei der Berufswahl meist wenig helfen, weil ich nur ein begrenztes Wissen ueber verschiedene Studienfaecher bzw. Berufe habe.

Appendix B

Maternal Confidence in Adolescents' Transition Management Scale Items

1. My mother is [I am] confident that I [my child] will choose a career which suits me [her] well.
2. My mother is [I am] confident that I [my child] will cope with the entry into university or vocational training.
3. My mother is [I am] afraid I do [my child does] not place enough importance on managing the final school exams and the upcoming transition. (recoded)
4. My mother is [I am] afraid I [my child] could enter a vocation or a major which wouldn't satisfy me [her/him] in the long run. (recoded)

Appendix C

Correlations Between Previous Exploration (Time 1) and Parenting (Time 1 and 2) and Career-Related Variables (Time 2)

Table 1. Correlations with Exploration (Time 2)

		Career exploration								
		Planfulness			In-breadth			In-depth		
		A	M	F	A	M	F	A	M	F
1.	Exploration grade 10 (A)	.35**	.20*	.19*	.14	.13	.07	.36**	.15	.21*
2.	Maternal warmth grade 10 (M)	-.04	.20*	.05	-.08	.09	-.07	-.02	-.06	-.03
3.	Paternal warmth grade 10 (F)	.03	.05	.23*	-.20*	.03	.05	-.02	-.06	-.03
4.	Maternal PsyCon grade 10 (M)	.01	-.18*	-.04	.04	-.04	-.02	.02	.00	.01
5.	Paternal PsyCon grade 10 (F)	.02	-.05	-.15	.13	.02	.04	.13	.04	.05
6.	Maternal warmth grade 12 (A)	.10	.03	.26**	-.01	.10	.12	-.05	.08	.05
7.	Paternal warmth grade 12 (A)	.13*	-.01	.21**	-.00	.05	.03	.09	.07	.04
8.	Maternal PsyCon grade 12 (A)	.04	.02	-.12	.03	.02	-.12	.12	.04	-.06
9.	Paternal PsyCon grade 12 (A)	.01	.00	-.15*	-.06	.02	-.10	.02	.07	.04

Note. A = adolescent report. M = maternal report. F = paternal report. PsyCon = psychological control.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2. Correlations With Parental Involvement (Time 2)

	Support				Interference				Confidence			
	Mother		Father		Mother		Father		Mother		Father	
	A	M	A	F	A	M	A	F	A	M	A	F
1.	.23**	.18*	.19*	-.12	.06	.05	-.04	-.15	.17*	.11	.20*	.00
2.	-.08	.10	.09	.16	-.15	-.11	-.09	-.05	.23**	.23**	.04	.14
3.	.04	.01	.13	.20*	-.07	.10	-.11	-.15	.10	-.01	-.03	.16
4.	.12	.02	-.12	-.04	.03	.32**	-.04	.14	-.24**	-.20*	-.20*	-.14
5.	.05	-.04	-.07	-.26**	.05	.20*	.07	.16	.00	-.06	-.02	-.05
6.	.35**	.08	.40**	.11	-.23**	-.19**	-.08	-.10	.39**	.08	.29**	.17*
7.	.37**	.08	.56**	.20**	-.10	-.09	-.12	-.08	.31**	.09	.31**	.18*
8.	-.18**	-.01	-.23**	.05	.38**	.18**	.18**	.18*	-.36**	-.06	-.29**	-.14
9.	-.21**	-.15*	-.31**	-.08	.29**	.13	.26**	.18*	-.27**	-.06	-.33**	-.10

Note. Row labels see Table 1.

A = adolescent report. M = maternal report. F = paternal report.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Appendix D

Career Exploration and Parents' Career-Related Involvement Diary Measures

Career Exploration

"How intensely during the last week did you engage in the following activities?"

In-Breadth Exploration Self: During the last week I thought about my strengths, abilities, and interests in general (e.g. what I am good at; which occupations I like).

In-Breadth Exploration Environment: During the last week I collected some general information and/or I talked with someone in general about occupations, majors or universities (e.g., which majors are on offer at XY university; what is a Bachelor's degree; which occupations exist that deal with media).

In-Depth Exploration Self: During the last week I thoroughly thought about whether the occupations/majors I consider entering really suit me (e.g., whether I could actualize my potentials; whether I am up to the requirements; whether or not and how I can reconcile my career plans with other life plans such as family).

In-Depth Exploration Environment: During the last week I collected concrete information about and/or talked with someone about on the occupations/majors/colleges I consider entering it (e.g., what is the numerus clausus for medicine; how are the English studies organized at XY university; what are the possibilities for student housing?).

Parents' Career-Related Involvement

"In our conversations..."

Support

1. ... my parent encouraged me to engage in activities related to the transition.
2. ... my parent was very engaged in helping me (e.g., suggested possible occupational options, helped me with collecting information, helped me connecting with useful social ties).

Interference

1. ... my parent pressured me to engage more in activities related to the transition.
2. ... my parent tried to influence me according to their wishes.

Zusammenfassung

Die vorliegende Arbeit befasst sich unter einer Entwicklungsregulationsperspektive mit der Rolle elterlichen Engagements im Zusammenhang mit berufsbezogenen Übergängen ihrer jugendlichen Kinder. Dieser Perspektive lag der Grundgedanke zugrunde, dass die übergangsbezogenen regulativen Anstrengungen von Jugendlichen durch ebenfalls übergangs- bzw. berufswahlbezogene regulative Anstrengungen der Eltern komplementiert werden. Zwei Hauptziele der Arbeit lassen sich festhalten: Zum einen zielte die Arbeit darauf ab, den Zusammenhang zwischen berufsbezogener Entwicklungsregulation durch Jugendliche und Eltern zu untersuchen. Zum zweiten fragte die Arbeit nach einem möglichen Nutzen der durch Jugendliche wie Eltern. Um die Forschungsfragen für die vorliegende Arbeit zu generieren wurden verschiedene Theorieansätze der Entwicklungsregulation Jugendlicher (hier bezeichnet mit Selbstregulation) wie auch elterlicher Regulation (hier: Fremdregulation, Sameroff, 2010) herangezogen.

Individuen stehen bezogen auf ihren beruflichen Werdegang einer Vielzahl von Übergangsphasen gegenüber, die jeweils die zukünftige Entwicklung auf verschiedene Weise bahnen (Nurmi, 2004; Salmela-Aro, 2009). Diese Übertritte ereignen sich bereits im schulischen Bildungssystem beim Wechsel von einer Schulform in eine weiterführende oder betreffen den Eintritt ins Arbeitsleben mit der Aufnahme einer berufsqualifizierenden Ausbildung nach Abschluss der Schule. Um diese Übergänge zu meistern, ist auf Seiten der Jugendlichen Eigeninitiative vonnöten (Nurmi, 2004; Heckhausen, Wrosch & Schulz, 2010; Savickas, 2005). Bisherige Theorien und Forschung haben sich bereits mit dem Konstrukt des phasenadäquaten Engagements befasst. Es umfasst jenes Verhalten, das von Jugendlichen mit dem Ziel unternommen wird, Entwicklungsziele im Zusammenhang mit bevorstehenden Übergängen zu erreichen (Kracke & Heckhausen, 2008). Diese Ziele können verschiedenen Inhaltes sein, wie etwa "herausfinden, welche Berufe zu meinen Stärken und Schwächen passen" oder "einen Studienplatz für Medizin bekommen". Gemeinsam ist diesen Entwicklungszielen der Fokus auf den Übergang. Sie stehen somit in Übereinstimmung mit altersbezogenen Normen und Standards (Nurmi, 2001; 2004). Zurückliegende Forschung konnte ebenfalls zeigen, dass phasen-adäquates Engagement den Jugendlichen unmittelbar nützt. So finden sie z.B. mit höherer Wahrscheinlichkeit einen Ausbildungsplatz, wenn sie sich aktiv bewerben (Nagy, Köller & Heckhausen, 2005). Darüber hinaus profitieren von Eigenaktivität auch Wohlbefinden und Zufriedenheit der Jugendlichen. Jene, die sich engagiert mit ihrer Berufswahl auseinandersetzen, sind zufriedener mit ihrer Studienentscheidung (Schindler & Tomasik, 2010) und haben ein besseres Wohlbefinden nach ihrem Schulabschluss als jene, die dies nicht tun (Haase, Heckhausen & Köller, 2008).

Neben der Bedeutung der phasenadäquaten Eigeninitiative für die erfolgreiche Bewältigung von Übergängen hat die entwicklungspsychologische Forschung immer wieder den Umstand betont, dass diese Initiative durch die Beziehungen zu anderen Personen sowie gesellschaftliche und institutionelle Rahmenbedingungen in einen sozialen Kontext

eingebunden ist (z.B. Silbereisen, Eyferth & Rudinger, 1986; Vondracek, Lerner & Schulenberg, 1986). Eltern haben in der Adoleszenz einen starken Einfluss auf die Entscheidungen der Jugendlichen deren Werdegang betreffend (Youniss & Smollar, 1985). Zwar hat die Untersuchung der Rolle elterlichen Verhaltens auf das phasenadäquate Engagement Jugendlicher zu einigen allgemeinen Erkenntnissen geführt – so gibt es etwa immer mehr Hinweise darauf, dass gute Beziehungen zu den Eltern (gekennzeichnet, unter anderem, durch Wertschätzung, Wärme und Konfliktarmut) in enger Verbindung mit mehreren Indikatoren der beruflichen Entwicklung Jugendlicher stehen (Whiston & Keller, 2004) – allerdings sind theoretische Konzeptualisierungen und empirische Forschung zu konkreten Prozessen, mit denen Eltern Jugendliche beeinflussen, eher rar. Diese Forschungslücke zu füllen beabsichtigte die vorliegende Arbeit.

Phasenadäquates Engagement kann sich in verschiedenen konkreten Verhaltensweisen zeigen, weshalb ein Fokus auf einen Aspekt angezeigt war. Diese Arbeit befasst sich vor allem mit der beruflichen Exploration, einem Aspekt phasenadäquater Eigeninitiative, der in der Literatur grosse Aufmerksamkeit genießt. Exploration umfasst die Prozesse der Suche und Verarbeitung berufsbezogener Informationen und des Vergleiches von Alternativen, die einer reflektierten Berufsentscheidung vorangehen (Patton & Porfeli, 2007). Elterliche Fremdregulation im beruflichen Kontext wurde in der Forschung bisher nicht systematisch untersucht. In der Arbeit wurde daher eine Konzeptualisierung und Operationalisierung berufswahlbezogenen Elternverhaltens entwickelt.

Unten stehende fünf Forschungsfragen wurden mit verschiedenen empirischen Studien und unterschiedlichen Formen der Datenerhebung zu beantworten versucht. Zum einen wurden Daten in zwei zeitlichen Dimensionen – auf einer Makroentwicklungsebene, was dem klassischen Vorgehen bei querschnittlichen sowie längsschnittlichen Studien in der Entwicklungspsychologie entspricht, und auf einer Mikroebene in wöchentlichem Abstand – gesammelt (Lichtwarck-Aschoff, Kunnen & van Geert, 2008). Zum anderen wurden in einem Mehrinformantendesign nicht nur die Jugendlichen selbst, sondern auch ihre Mütter und Väter befragt. Auf der Basis von vier Datensätzen enthält die vorliegende Arbeit fünf empirische Studien. Drei Datenerhebungen wurden auf der Makroentwicklungsebene noch während der Schulzeit angesiedelt. Komplettiert wurden diese durch eine Tagebuchstudie mit wöchentlichen Erhebungszeitpunkten während der Bewerbungsphase für Hochschulstudiengänge. Die zentralen Ergebnisse sind anhand der fünf Forschungsfragen wie folgt zusammenzufassen:

(1) Worin genau bestehen die eigentlichen Prozesse phasenadäquaten Engagements am Übergang Schule–Studium? Diese Frage wurde auf der Mikroebene angegangen. Die Ergebnisse deuten auf eine grosse Variabilität sowohl zwischen den Jugendlichen als auch innerhalb der einzelnen Jugendlichen hin. Das heisst einerseits, dass sich interindividuelle Unterschiede dahingehend zeigten, wie Jugendliche ihre Entscheidung für eine bestimmte Hochschulausbildung vorantrieben bzw. herbeiführten. Diese Unterschiede im Entscheidungsprozess korrespondierten mit dem Ausmass der gezeigten Exploration. Andererseits kennzeichneten die Befunde Exploration als ein stark fluktuierendes Ver-

halten, das sich von Woche zu Woche ändert.

(2) Wie ist, betrachtet aus dem Ansatz elterlicher Fremdregulation, berufswahlbezogenes Elternverhalten am besten beschreibbar? In dieser Arbeit wurde ein Befragungsinstrument zur Erfassung elterlicher Fremdregulation entwickelt und validiert. Drei Facetten von berufswahlbezogenem Elternverhalten wurden operationalisiert: Unterstützung, steuernde Kontrolle und fehlende Beteiligung.

(3) Wie hängen phasenadäquates Engagement von Jugendlichen und berufswahlbezogenes Elternverhalten zusammen? Die Zusammenschau der Ergebnisse zeigte, dass elterliche Unterstützung positiv mit dem Explorationsverhalten Jugendlicher in Verbindung stand. Darüber hinaus war die Bedeutung steuernder Kontrolle abhängig von der Art der Exploration und abhängig von der zeitlichen Messebene (Makro- ggü. Mikroebene). Steuernde Kontrolle und zu einem gewissen Grad auch fehlende Beteiligung zeigten einen positiven Zusammenhang mit Entscheidungsproblemen.

(4) Hängen die Intensität und der Zusammenhang von jugendlicher und elterlicher Entwicklungsregulation von zeitlichen und prozessualen Charakteristika des Überganges ab? Empirische Untermauerung fand sich für die Annahme, dass die Exploration der Jugendlichen von prozessualen Merkmalen eines Überganges beeinflusst ist. Elterliches Regulationsverhalten zeigte sich anpassungsfähig an die Situation des Jugendlichen und war ebenfalls von prozessualen Merkmalen des Überganges beeinflusst.

(5) Wie zahlt sich phasenadäquates Engagement Jugendlicher aus mit Blick auf die Zufriedenheit mit dem Prozess des Überganges Schule–Studium als auch auf die Anpassung an das spätere Studium? Gibt es auch einen Nutzen von berufswahlbezogenem Elternverhalten? Die Ergebnisse der Tagebuchstudie zeigten, dass sowohl die Exploration der Jugendlichen als auch die Unterstützung der Eltern mit höherer Zufriedenheit der Jugendlichen mit dem Prozess des Überganges einhergingen. Darüber hinaus wiesen die Ergebnisse darauf hin, dass ein Entscheidungsprozess, an dessen Ende eine starke Bindung (Commitment) an das gewählte Studienfach stand, von einem höheren Mass an Exploration gekennzeichnet war und eine bessere Anpassung an das spätere Studium zur Folge hatte.

Zusammenfassend lässt sich festhalten, dass die Entwicklung geeigneter Messinstrumente es ermöglichte, theoretische Annahmen betreffend die Übergangsbezogene Entwicklungsregulation von Jugendlichen und Eltern auf der Makro- und der Mikroebene zu überprüfen. Die Befunde bilden eine Basis für zukünftige Forschung, die sich möglichen Mechanismen der Selbst- und Fremdregulation widmet. Diese Arbeit schliesst mit diesbezüglichen Anregungen unter einer dynamischen Perspektive auf Entwicklung (van Geert & Steenbeck, 2005).

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Information About the Contribution of Other People to This Thesis

Information About Co-Authors

The empirical papers in this thesis emerged out of the collaboration with several co-authors. I was in charge for writing the manuscripts. However, I received feedback of my co-authors several times during the process of writing. Moreover, several colleagues once reviewed a manuscript. I am the sole author of the General Introduction as well as the General Discussion chapters.

Prof. Bärbel Kracke is my advisor at the University of Erfurt. She contributed to the planning of the manuscripts for study 1 to 4. Further, she was the main person to give feedback on all manuscripts during the process of writing.

Prof. Jari-Erik Nurmi is a full professor at the University of Jyväskylä, Finland. He was substantially involved in analyzing the data of study 4 and provided feedback to the manuscript. He once reviewed the manuscript of study 1.

Prof. Peter Noack is a full professor at the Friedrich Schiller University Jena. The data collection for study 3 was included into an ongoing longitudinal project in his research group. He contributed to generating the material for study 3 and provided feedback to the manuscript. He once reviewed the manuscript of study 2.

Dr. Anna Lichtwarck-Aschoff is an assistant professor at the Radboud University Nijmegen, Netherlands. She was substantially involved in analyzing the data of study 5. She wrote small parts and provided feedback to the manuscript.

Katharina Diener is a doctoral researcher at the Friedrich Schiller University Jena. She contributed to the discussions for the material of study 3 and was in charge of the data collection.

Development of Study Material

During the work on this thesis, various measures had to be developed. First, the adolescent and the parent version of the PCB instrument were developed (the main work on the adolescent version of the instrument was done already in my master's thesis, see below). Bärbel Kracke, Peter Noack, and Katharina Diener were involved in discussions for developing and improving the parent version of the PCB. The parent version was tested in study 2 and revised for the use in study 3.

Second, a new exploration measure was developed to capture career exploration in-breadth and in-depth. Bärbel Kracke and I contributed equally in the development of this measure. Peter Noack was involved in improving item wordings. The material was tested in study 2 and revised for the use in study 3.

Third, I designed the measures to be used in the diary study. Bärbel Kracke and I discussed those measures several times. The material was tested in a pilot study with 3 adolescents and their mothers. There was no need to revise the measures used in study 4 and 5. However, I improved other measures not included in this thesis for the main diary data collection.

Planning and Execution of the Diary Study

I was in charge for designing and planning the diary study as well as for acquiring and taking care of participants. Bärbel Kracke and I discussed the study design and issues related to data collection multiple times. Apart from the discussions with Bärbel Kracke, I received feedback on the design of the study as well as on practical issues in collecting diary data from various colleagues.

Additional Information About Study 1

The main work on the adolescent version of the PCB was done as part of my master's thesis, completed in 2007 (advisor: Bärbel Kracke). For study 1 of this dissertation, I re-analyzed the data with a different set of items (some items used previously were excluded in the final version for reasons of content validity). Further, I conducted additional analyses. These included the multi-sample analyses with gender as a moderator as well as the analyses involving the interactions between the latent variables of support, interference, and lack of engagement. The manuscript for study 1 was prepared entirely during the work on this dissertation.

Ehrenwörtliche Erklärung

Ich erkläre hiermit ehrenwörtlich, dass ich die vorliegende Arbeit ohne unzulässige Hilfe Dritter und ohne Benutzung anderer als der angegebenen Hilfsmittel angefertigt habe; die aus fremden Quellen direkt oder indirekt übernommenen Gedanken sind als solche kenntlich gemacht. Bei der Auswahl und Auswertung des Materials sowie bei der Herstellung des Manuskripts habe ich Unterstützungsleistung von folgenden Personen erhalten:

1. Prof. Dr. Barbel Kracke, Universität Erfurt
2. Prof. Dr. Jari-Erik Nurmi, Universität Jyväskylä, Finnland
3. Prof. Dr. Peter Noack, Universität Jena
4. Dr. Anna Lichtwarck-Aschoff, Universität Nijmegen, Niederlande

Weitere Personen waren an der geistigen Herstellung der vorliegenden Arbeit nicht beteiligt. Insbesondere habe ich nicht die Hilfe eines Promotionsberaters in Anspruch genommen. Dritte haben von mir weder unmittelbar noch mittelbar geldwerte Leistungen für Arbeiten erhalten, die im Zusammenhang mit dem Inhalt der vorgelegten Dissertation stehen. Die Arbeit oder Teile davon wurden bisher weder im Inland noch im Ausland in gleicher oder ähnlicher Form einer anderen Prüfungsbehörde als Dissertation vorgelegt. Ferner erkläre ich, dass ich nicht bereits eine gleichartige Doktorprüfung an einer Hochschule endgültig nicht bestanden habe.

Erfurt, den 01.11.2010