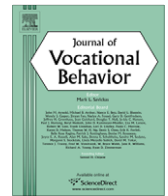




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Career adaptability development in adolescence: Multiple predictors and effect on sense of power and life satisfaction

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ABSTRACT

This longitudinal panel study investigated predictors of career adaptability development and its effect on development of sense of power and experience of life satisfaction among 330 Swiss eighth graders. A multivariate measure of career adaptability consisting of career choice readiness, planning, exploration, and confidence was applied. Based on Motivational Systems Theory four groups of predictors were assessed: positive emotional disposition, goal decidedness, capability beliefs and social context beliefs. Influence of gender, age, immigration background, parental educational level, and college-bound or vocational education plans were also assessed. Perceived social support and positive emotional disposition, non-immigration background, and continuing to vocational education were single significant predictors of more career adaptability development over the school year. Supporting the connection of career adaptability and positive youth development, increase in career adaptability over time predicted increase in sense of power and experience of life satisfaction.

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1. Introduction

Preparing for one's vocational future is generally considered one of the core developmental tasks in adolescence (Erikson, 1968; Super, 1990) and countries throughout the world have recognized the importance of assisting adolescents in successful career preparation (OECD/European Communities, 2004). A central construct in adolescent career preparation and development is career adaptability which can be defined as "...the readiness to cope with the predictable tasks of preparing for and participating in the work role and with the unpredictable adjustments prompted by the changes in work and work conditions" (Savickas, 1997, p. 254). A number of prospective longitudinal studies showed that adolescents higher in career adaptability in terms of decision making, planning, exploration, or confidence beliefs are more successful in mastering vocational transitions (Creed, Muller, & Patton, 2003; Germeijs & Verschueren, 2007; Neuenschwander & Garrett, 2008; Patton, Creed, & Muller, 2002).

Recently, there has been an interest in linking adolescent career development with positive youth development, the emerging interdisciplinary study of antecedents and consequences of well-being and thriving. Existing research has indicated that career adaptability is a sign of thriving in adolescence which directly relates to positive youth development. Specifically, in studies with US high-school students (Gore, Kadish, & Aseltine, 2003; Skorikov, 2007b; Skorikov & Vondracek, 2007), positive career orientation and better career preparation was shown to prevent problem behavior and promoted well-being and decreased distress (see Skorikov, 2007a, for a review).

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Given the potentially important effects of career adaptability on positive youth development and the international attention on promoting positive adolescent career preparation, more research regarding predictors of career adaptability development is important. Numerous studies investigated correlates of career adaptability in college and high-school students and showed that aspects of career adaptability relate to gender, age, or work experience (see Patton & Creed, 2001, for a review). Other studies showed that predictors of more career adaptability include career decision making self-efficacy beliefs, personality traits, or parental behavior and attachment (e.g., Bartley & Robitschek, 2000; Betz & Klein Voyten, 1997; Kracke, 2002). However, very little empirical work was done with students in middle adolescence and most studies relied on cross-sectional data. Also, career adaptability was mostly examined by single aspects such as decisions-making or exploration and few studies are available which applied a more comprehensive multidimensional measure of career adaptability. Finally, most studies investigated only a very specific set of predictors and/or more or less arbitrarily combined several different variables. There seems to be a need for empirical research to investigate career adaptability in a more comprehensive manner and to apply a clearer theoretical rationale of what predictor variables would be important to study and in which combination. For example, only a few studies investigated both contextual and personal variables as possible predictors of career adaptability development.

1.1. Present study and hypotheses

The present study applied a multidimensional measure of career adaptability which is based on Savickas' (1997, 2002) model which states that career adaptability consists of the four dimensions career decision making, planning, exploration, and confidence (see Hartung, Porfeli, & Vondracek, 2008, for a review). One challenge when applying a multidimensional model is that the nature of the relationships between the single dimensions has to be explicit. Unfortunately, not much attention to this issue regarding career adaptability can be found in the literature since most studies investigated single dimensions separately (Creed & Patton, 2003; Rogers, Creed, & Ian Glendon, 2008). As one notable exception Skorikov (2007b) used measures for career decidedness, career planning, and career confidence combined to represent a latent construct of career preparation. In contrast to this approach, I decided to represent career adaptability not as a latent but as an aggregate construct. The distinction has important theoretical and methodological implications. In a latent construct the theoretical notion is that the construct exists on a higher-order level underlying the single measure indicators. Conversely, an aggregate model is based on the assumption that the construct is formed by the combination of its single measure indicators (Law, Wong, & Mobley, 1998). For example, general intelligence is a latent construct which is expressed by scores of different verbal, numerical, and symbolic intelligence measures. On the other hand, job satisfaction is an aggregate construct which represents the combined levels of satisfaction with, for example, supervisors, co-workers, working conditions, or pay (cf. Law et al.). Methodologically, a latent construct represents the shared variance among different measures while an aggregate construct represents the unique and shared variance of the measures. Regarding career adaptability, it seems to make more sense to argue that high levels on the dimensions of decision making, planning, exploration, and confidence lead to higher career adaptability than to assume that higher career adaptability leads to higher levels in decision making, planning, exploration, and confidence. Therefore, the combined level of the four career adaptability dimensions and not their shared variance seems to be the appropriate way to conceptualize and measure a multidimensional construct of career adaptability. The same argument was also made for the related construct of employability by Fugate, Kinicki, and Ashforth (2004).

The first goal of the present study was to investigate factors which foster development of career adaptability over time in adolescence. A systematic and comprehensive set of multiple predictors of career adaptability based on Ford's Motivational System Theory (MST; Ford, 1992) was applied. MST builds upon the theory of persons as self-constructing living systems (Ford, 1987) and is based on an integrative review of motivational theories. MST proposed that thriving and achievement is facilitated by the interaction of emotions, agency beliefs (capability and context beliefs), and goals (Ford & Smith, 2007). One advantage of investigating predictors of career adaptability based on MST is that this model incorporates the theoretical and empirical knowledge of several motivational theories into a common framework (cf. Ford, 1992). It also accounts for the fact that persons are complex, self-constructing living systems where emotions and cognitions interact to produce achievements and it takes into account both personal and environmental factors which can be considered a cornerstone in current developmental theory and research (e.g., Ford & Lerner, 1992). As such, it provides a more complete picture of possible predictors than if just single components (e.g., self-efficacy beliefs) were examined. Another advantage of MST is that it offers several principles and applications of how to motivate people in order to increase their achievement (cf. Ford, 1992).

Based on MST four sets of predictors were investigated: (1) *Emotions* were accounted for by investigating the influence of a positive emotional disposition that encompasses emotional stability, high energy level, and positive affect. These traits are commonly associated with two of the Big-Five personality traits, namely emotional stability and extraversion (Costa & McCrae, 1997). Research implies that a more favorable emotional disposition in terms of emotional stability and extraversion is related to more career planning and exploration among adolescents (Rogers et al., 2008). *Agency beliefs* were investigated in terms of (2) *capability beliefs* which were analyzed in the presents study in terms of generalized self-efficacy beliefs. It was assumed that higher capability beliefs promote the development of adolescent career adaptability (e.g., Creed, Patton, & Prideaux, 2007); and (3) *context beliefs*, that is how supportive one's environment is perceived to be in terms of available social support and opportunities. This aspect was accounted for by perceived social support in the present study. Research showed that perceived support from the social environment is crucial for successful adolescent vocational preparation

(e.g., Kracke, 2002). (4) *Goals*, in terms of career goal decidedness and specification was included in the assessed model as the fourth variable. Goal clarity was related to more career exploration and planning in other studies with adolescents (Kracke & Schmitt-Rodermund, 2001; Rogers et al., 2008).

The second goal of the study was to investigate the effect of career adaptability development in adolescence on indicators of positive youth development. According to a developmental–contextual view of positive youth development, the adaptive regulation of continuous and dynamic person–context interactions facilitates the development of valued behaviors and beliefs across time and should be related to adjustment and well-being within time (Lerner & Lerner, 2006). In the present study, two indicators of positive youth development and well-being were assessed: (1) A sense of personal power which indicates whether an adolescent feels he or she has control over “Things that happen to me”. Scales and Leffert identified personal power as one developmental asset which promotes positive youth development as a component of a positive identity (Scales, Benson, Leffert, & Blyth, 2000; Scales & Leffert, 1999). (2) Satisfaction with life as one of the most frequently used indicators of subjective well-being, which refers to a judgment regarding the overall quality of a person’s life according to his or her own unique set of criteria (Pavot & Diener, 1993).

The study also investigated the effects of several variables which could have an effect on development of career adaptability: gender, age, ethnic background, parental educational level, and attending a vocational or college-bound education after mandatory school. In contrast to the other investigated psychological measures these variables are indicators of the exosystem (Bronfenbrenner, 1979) of an adolescent. They also represent factors of human capital (Coleman, 1994) which are well-established to affect career development in adolescence within the sociological research literature (Caspi, Wright, Moffitt, & Silva, 1998; Haeblerlin, Imdorf, & Kronig, 2004). Based on research on adolescent career development (Patton & Creed, 2001; Skorikov & Patton, 2007) it was expected that female gender, older age, native ethnic background, higher parental education, and plans to attend a vocational school would be positively related to development of career adaptability over time. Based on the literature reviewed above it was further expected that controlling for the effect of human capital and socio-demographic variables: (1) the four assessed factors of MST would significantly predict the development of more career adaptability over time; (2) increase in career adaptability would predict an increase in sense of power over time; and (3) higher career adaptability would predict experience of well-being in terms of more life satisfaction.

The study took place in Switzerland among a group of students in eighth grade. The Swiss educational system places a strong emphasis on vocational education and training. About 70% of all students continue to one of over 200 vocational education and trainings after mandatory school (Bundesamt für Berufsbildung und Technologie, 2007). These students have to apply for an apprenticeship by the end of eighth grade to the beginning of ninth grade. Students are basically free to apply to the vocation(s) of their choice but the available vocational educations differ remarkably in availability and personal requirements and are offered on a competitive basis by private firms which requires a thorough career preparation prior to this transition. The minority of students who continues to a general high-school (which prepares for later college education) also has to apply for and conduct entry exams to these schools during this time period. This implies that adolescents in Switzerland have to master a career decision making process during the eighth grade, which has profound consequences for their future vocational development and which makes this grade an ideal time to study development and effects of career adaptability.

2. Method

2.1. Participants

Students from five different schools in a rural area in the German speaking part of Switzerland participated in the study ($N = 330$). All students were in the eighth grade and their ages ranged from 12 to 16 years ($M = 14.09$, $SD = 0.71$) at the first time of measurement. Half of them were girls ($n = 165$), 120 (36.4%) attended a school type with basic requirements (Realschule) while the others attended a school type with advanced requirements (Sekundarschule). This separation is mainly based on the general scholastic achievement of a student in elementary school. School-types with advanced requirements open up more vocational possibilities and also allow attending general high-school which directly prepares for later college education. Fifty-seven students (17.3%) had an immigration background, mostly from South-Eastern Europe, the others were Swiss nationals. The distribution of gender, attended school type, and immigrant background was representative for Swiss students in this grade (Swiss Federal Statistical Office, 2006).

2.2. Measures

2.2.1. Demographic questionnaire

Students were asked to indicate their gender, nationality, age in years, whether they had passed the entry exam for general high-school, and occupation of father and mother. Sixteen percent ($n = 54$) of the students indicated that they had successfully passed the entry examination for general high-school starting in ninth grade. Nationality was coded as Swiss or other nationalities. Students indicating both a Swiss and one or more other nationalities were assigned to the Swiss group. Occupation of father and mother was coded according to their required educational level, ranking from 0 (no post-secondary education) to 5 (university degree of masters level or higher). The assignment of level of educational to each occupation was undertaken according to the occupational database provided on the website www.berufsberatung.ch which is the official

occupational information resource supported by the Swiss Federal Office for Vocational Education and Technology. The higher of the two scores for father and mother was taken as the indicator of parental level of education. Most students (44.5%) had parents with basic post-secondary education (Level 1) and the average educational level of parents was 2.1 ($SD = 1.6$).

2.2.2. Emotional disposition

The official German language adaptation of the NEO-FFI (Borkenau & Ostendorf, 1993; Costa & McCrae, 1992) was used to measure emotional stability and extraversion with 11 items each (e.g., “I seldom feel lonely or sad”) and a 4-point Likert scale ranging from *strongly disagree* to *strongly agree* based on the recommendations of scale evaluation studies with adolescents (Lüdtke, Trautwein, Nagy, & Köller, 2004; Roth, 2002). The authors of the scale provide broad support for the scale’s construct validity in terms of correlations to other established personality inventories. Cronbach’s Alpha was .76 for emotional stability and .71 for extraversion in the present sample. The two scales correlated with $r = .448$, $p < .001$. A positive emotional disposition was conceptualized as a latent construct indicated by the two applied measures. Consequently, a score for the two measures was calculated using principal-axis functioning. This procedure produces a score which represents the shared variance among the two single measures with higher scores indicating a more positive emotional disposition. The factor analysis confirmed the existence of one factor explaining 73% variance among the two measures.

2.2.3. Goal decidedness

The degree of career goal decidedness and specification was assessed with one scale and two indices: (1) The German language adaptation of the *Vocational Identity Scale* (Holland, Daiger, & Power, 1980; Jörin, Stoll, Bergmann, & Eder, 2004) was used. It is a measure of goal clarity and decidedness consisting of 10 items (e.g., “I’m not sure yet which occupations I could perform successfully”) and a 5-point Likert scale response format ranging from *not at all* to *completely*. Support for the scale’s construct validity was provided by positive correlations of the scale to career decidedness, career planning, and career exploration (Hirschi & Läge, 2007a). Cronbach’s Alpha in the present sample was .86. (2) The *phase of career decision making index* developed by Hirschi and Läge (2007b) was used, which asked students to indicate which of six statements best resembled their current situation ranking from 1 “I have never really thought about my vocational future” to 6 “I already know exactly what I want to do in the future”. Supporting the construct validity of the index, Hirschi and Läge (2007b) reported significant positive relations to vocational identity, career decidedness, career planning, and career exploration and number of considered career alternatives. (3) The Occupational Alternatives Question (OAQ) was applied (Slaney, 1980). Each student indicated on the questionnaire his or her current career aspirations in a free listing form and was then asked to indicate whether he or she had already made a first choice among those goals. A value ranking from 1 to 4 was assigned with 1 for no first choice and no goals; 2 for goals but no first choice; 3 for a first choice and several goals; and 4 for a first choice and only one goal. Higher values indicate more goal prioritization, clarity and commitment. Support for the construct validity of this index is provided by several studies (e.g., Germeijs & Verschueren, 2006). The three measures showed a mean correlation of $r = .43$, $SD = .16$, all $p < .001$, in the present sample. Goal decidedness was conceptualized as a latent variable which is indicated by the three measures. Accordingly, a factor score for the three measures using principal-axis factoring was calculated with higher scores indicating more goal decidedness. The factor analysis confirmed the existence of one factor underlying the three measures and representing 63% of their shared variance.

2.2.4. Social context beliefs

As a specific component of context beliefs, the amount of perceived social support during the career decision making process in eighth grade was assessed with a modified version of the University of California, Los Angeles, Social Support Inventory (UCLA-SSI; Schwarzer, Dunkel-Schetter, & Kemeny, 1994). Its factorial structure and utility for assessing positive coping in various life domains was confirmed by different studies (e.g., Simoni, Martone, & Kerwin, 2002). The scale includes 16 items and students had to indicate on a 5-point Likert scale how often they received emotional, informational, and tangible support over the last school year from their parents, friends and relatives, teachers, and organizations, ranking from *never* to *very often*. Alpha was .85 in the present sample with higher scores indicating more perceived social support.

2.2.5. Capability beliefs

Capability beliefs were assessed by *Generalized self-efficacy beliefs* (GSE) with the Inventory for the Measurement of Self-Efficacy and Externality [FKK] (Krampen, 1991) which includes 16 items for GSE on a 6-point Likert scale response format ranging from *very wrong* to *very true* (e.g., “I can determine very much of what happens in my life”). Higher points indicate a higher level of GSE. Support for the scale’s content and criterion validity is provided for adolescents in terms of significant relations to personality traits, psychological disorders, well-being, and school achievement (Anderson, Hattie, & Hamilton, 2005; Krampen, 1991). Alpha was .73 and .71 at the two measurement points, respectively.

2.2.6. Sense of power

A personal sense of power was assessed by generalized self-efficacy (GSE) and internality of control beliefs (cf. Scales & Leffert, 1999). The same GSE scale as described above was also used to represent the respective aspect of sense of power since the two constructs were used in independent analyses. Internality of control was also measured with the Inventory

for the Measurement of Self-Efficacy and Externality [FKK] (Krampen, 1991) consisting of 16 items for control beliefs (e.g., “Much of what happens in my life depends on luck”) on a 6-point Likert scale response format ranging from *very wrong* to *very true*. Alpha was .79 and .84 at the two measurement points, respectively. Support for the scale’s construct validity is available for German and New Zealand adolescents (Anderson et al., 2005; Krampen, 1991). The two scales correlated with $r = .31$ and $.22$ at the two measurement points, respectively. Two factor scores representing the shared variance of the two measures at each measurement point were calculated with higher points indicating a higher personal sense of power. The results confirmed the existence of one factor explaining 65% and 61% of shared variance among the two measures at the two measurement points, respectively.

2.2.7. Life satisfaction

The German language adaptation of the Satisfaction with Life Scale (SWLS, Diener, Emmons, Larsen, & Griffin, 1985) was applied as an indicator of subjective well-being. The scale has been found to possess excellent reliability and validity, as well as applicability to research with adolescents (e.g., Lucas, Diener, & Suh, 1996; Neto & Barros, 2007). The German language version showed proprieties similar to the original version among a group of Swiss adults (Peterson, Ruch, Beermann, Park, & Seligman, 2007). Alpha was .82 in the present study with higher scores indicating more life satisfaction.

2.2.8. Career adaptability

Based on Savickas’ (1997, 2002) model, the degree of career adaptability was assessed with four measures. (1) *Career choice readiness* was assessed with the German language adaptation of the Career Maturity Inventory (Crites, 1973; Seifert & Stangl, 1986) Career Decidedness/Commitment Scale consisting of 12 items (e.g., “I don’t know exactly what to do in order to choose the right occupation”) and a 4-point Likert response scale ranging from *not true* to *true*. Supporting the construct validity of the scale with adolescents, studies showed a significant relationship to positive career attitudes or more active application for an apprenticeship after school (e.g., Bergmann, 1993; Seifert, 1993). Cronbach’s Alpha within the present sample was .87 at both measurement points.

(2) *Career planning* was assessed with the German language adaptation of the Career Development Inventory (Seifert & Eder, 1985; Super, Thompson, Lindeman, Jordaan, & Myers, 1981). The 22-item scale measures time and effort invested in career planning and knowledge about preferred occupations (e.g., “I have talked about career plans with an adult who knows something about me”) with a 5-point Likert scale ranging from *very few* to *a lot*. Higher scores indicate more engagement in career planning. Different studies provided support for the scales’ construct and predictive validity with adolescents, for example, positive relations to career knowledge, decidedness, and obtain an apprenticeship after school (e.g., Seifert, 1993; Seifert & Eder, 1985). Alpha was .89 and .90, respectively.

(3) *Career exploration* was assessed at the first measurement point with the career exploration scale from the German language adaptation of the Career Development Inventory (Seifert & Eder, 1985; Super et al., 1981). The scale asks students to indicate how likely they would turn to different sources for gaining information regarding their career development (e.g., my father, my teacher, job-shadowing) and how much information they have already received from those same sources with 26 items on a 5-point Likert scale ranging from *no information* to *very much information*. Higher scores indicate more favorable career exploration attitudes. Studies showed significant relations to career decidedness, career planning, and success in finding an apprenticeship for adolescents (e.g., Seifert, 1993; Seifert & Eder, 1985). Cronbach’s Alpha was .85. At the second measurement point, a behaviorally oriented measure for vocational exploration, tapping both self- and environmental behavior, was applied. As is the case in the Career Exploration Survey scale from Stumpf, Colarelli, and Hartman (1983) and other scales used in published research on vocational exploration (Kracke, 2002), students were asked to indicate on a 5-point Likert scale to what degree they have engaged in various behaviors of self-exploration (4 items, e.g., “reflecting about personal interests and skills”) and environmental exploration (6 items, e.g., “collecting information about different vocational options”) during the last three months, with answers ranging from *seldom/few* to *very much/a lot*. Supporting the construct validity, Hirschi (2008) reported significant relations to general interest level and career commitment. Alpha was .90. To test the relation of the two applied career exploration scales, a group of 82 students (56% female) in eighth grade from the same region, which were not part of the present study, completed both measures. The scales showed a correlation of $r = .39$, $p < .001$.

(4) *Confidence* was assessed with two *career specific competency beliefs* scales. At the first measurement point, students indicated on a 5-point Likert scale, ranking from *not at all* to *very much*, how likely it was that they could eventually reach a satisfactory career choice, how competent they felt to reach a satisfactory career choice, and how well they knew how to engage in the career decision making process (3 items, Alpha = .61). At the second measurement point, students indicated on the same scale how competent they felt to undertake various tasks related to the imminent phase of applying for and securing a vocational apprenticeship, for example, writing an application letter or successfully conducting a job interview (5 items, Alpha = .83).

Career adaptability was conceptualized as an aggregate model, where choice readiness, planning, exploration, and confidence jointly produce a high career adaptability. In turn, two principal component scores for the four measures were calculated with principal component factor analysis where higher scores indicate more career adaptability. The results of this analysis confirmed the existence of one factor representing those four measures which explained 56% and 63% of the variance among the measures at the two measurement points, respectively.

2.3. Procedure

Each participant completed all questionnaires during an ordinary school lesson in their classrooms under the supervision of their teachers. All students present at the time of data collection completed the survey. The first measurement point (T1) was at the beginning of the eighth grade and included the demographic questionnaire, measures for goal decidedness, capability beliefs, and career adaptability. The second point of data collection (T2) was at the end of eighth grade, approximately 10 months after the first measurement point, and included the indication of passed high-school examination and the measures for career adaptability, emotional disposition, perceived social support, capability beliefs, and life satisfaction.

3. Results

3.1. Preliminary analyses

3.1.1. Attrition analysis

Twenty-two students (6.7%) of the initial group did not complete the questionnaires at T2. Those students did not differ in gender or nationality distribution or on any measure assessed at T1 from the remaining group. Missing data analysis showed that single missing values among the participants completing the questionnaires at both times were missing at random and missing scores were replaced using the estimation–maximization algorithm in SPSS 16.0. All values were *z*-transformed.

3.1.2. Correlations among the assessed constructs

The results presented in Table 1 show that boys had more goal decidedness and higher capability beliefs than girls. Students with an immigration background (i.e. no Swiss nationality) were older, less likely to attend general high-school, and had lower educated parents than Swiss students. They showed no difference to Swiss students at T1 in career adaptability

Table 1
Correlations among the assessed constructs.

	1	2	3	4	5	6	7	8	9	10
1 Gender ^a	—									
2 Nationality ^a	.056	—								
3 High-school ^a	-.059	.139*	—							
4 Age ^a	.030	-.132*	-.151**	—						
5 Parent Ed. ^b	-.003	.211***	-.269***	-.007	—					
6 Goals ^a	.160**	.094	.011	.150**	-.065	—				
7 Capability B. ^a	.143**	.037	.101	.006	.035	.307***	—			
8 Pos. emotion ^b	-.055	.045	-.014	-.054	.058	.101	.269***	—		
9 Social support ^b	-.065	-.035	-.181**	.086	-.072	.028	.135**	.075	—	
10 Career Adapt.T1 ^a	.101	.098	-.041	.025	-.009	.590***	.434***	.112	.270***	—
11 Career Adapt.T2 ^b	.093	.158**	-.256***	.017	-.068	.374***	.188**	.214***	.322***	.570***
12 Power T1 ^a	.074	.096	.196**	-.050	.073	.300***	.808***	.393***	.048	.379***
13 Power T2 ^b	.008	.092	.133*	-.064	.157**	.152**	.444***	.608***	.071	.260***
14 SWL ^b	-.031	.129*	-.124*	-.136*	.176**	.147**	.315***	.481***	.157**	.160**
			11		12			13		14
1 Gender ^a										
2 Nationality ^a										
3 High-school ^a										
4 Age ^a										
5 Parent Ed. ^b										
6 Goals ^a										
7 Capability B. ^a										
9 Pos. emotion ^b										
9 Social support ^b										
10 Career Adapt.T1 ^a										
11 Career Adapt.T2 ^b			—							
12 Power T1 ^a			.148**		—					
13 Power T2 ^b			.298***		.576***			—		
14 SWL ^b			.225***		.519***			.303***		—

Note. Correlations for first four variables are Spearman the other are Pearson Ed., education; B., beliefs; Pos., positive; Adapt., adaptability; SWL: satisfaction with life.

Coding: Gender: female = 0, male = 1; nationality: Swiss = 1, other = 0; high-school: do not attend general high-school = 0, do attend general high-school = 1. ^aN = 330.

^bN = 308.

**p* < .05.

***p* < .01.

****p* < .001.

but reported significantly lower values in career adaptability and life satisfaction at T2. Older age was negatively related to attending high-school, parental educational level, and life satisfaction but positively to goal decidedness at T1. Students who attended general high-school had parents with higher education levels, but reported less positive social context beliefs and less career adaptability at T2. Among the MST variables goal decidedness related positively to capability beliefs but not the other two variables. Capability beliefs related positively to emotional disposition and perceived social support. Emotional disposition and social support were not significantly related. Career adaptability at T1 related positively to all four MST variables although the relation to emotional disposition was significant only at the $p = .05$ level for this sample size. Career adaptability at T2 related significantly to all four MST variables. Sense of power at both measurement points and life satisfaction related all positively to career adaptability at both measurement points. Finally, life satisfaction related positively to sense of power at both measurement points.

3.2. Predictors of career adaptability

A hierarchical multiple regression analysis was applied to test the hypothesis that the motivational variables goal decidedness, capability beliefs, emotional disposition, and social context beliefs significantly predict the development of career adaptability over time above and beyond socio-demographic and human capital variables of gender, age, nationality, attending general or vocational high-school, and parental level of education. In a first step, career adaptability at T1 was entered in the equation to control for the baseline level of the construct. In this way all subsequently entered variables indicated their predictive utility for interindividual change in adaptability over time. In a second step all the socio-demographic/human capital variables and in a third step all the motivational variables were entered.

The results in Table 2 show that adaptability at T1 explained about 32% variance in adaptability at T2, $F(1,306) = 147.45$, $p < .001$, indicating a considerable interindividual stability of the construct over time. The socio-demographic variables accounted for an additional 7.3% explained variance, $F(5,301) = 7.28$, $p < .001$. Swiss nationality and not attending general high-school were significant single predictors for increase in adaptability. The four motivational variables explained an additional 5.2% variance, $F(4,297) = 6.96$, $p < .001$. More favorable emotional dispositions and more positive social context beliefs were single significant predictors of interindividual adaptability increase over time.

3.3. Effect of career adaptability on sense of power and life satisfaction

To test the hypothesis that an increase in career adaptability would predict an increase in sense of power over time and experience of more life satisfaction, two hierarchical multiple regression analyses were undertaken. In the first analysis, sense of power at T2 was the dependent variable and sense of power at T1, emotional disposition, and base level of career adaptability at T1 were first entered into the equation as control variables. Controlling for emotional disposition is important since research showed a significant relation to sense of power in terms of self-efficacy and control beliefs (Judge, Erez, Bono, & Thoresen, 2002) and it was hypothesized that it would also predict career adaptability. Controlling for the baseline measure of career adaptability at T1 allows estimating the effect of increase in career adaptability on the outcome measures. Finally, controlling for sense of power at T1 allows estimating the predictive utility of the independent variables on interindividual change in the construct over time. In the second analysis satisfaction with life was the dependent variable. In a first step, sense of power at T2, emotional disposition, and baseline level of career adaptability at T1 were controlled for. Controlling for sense of power is important because it related significantly to satisfaction with life (e.g., Vecchio, Gerbino, Pastorelli,

Table 2
Hierarchical regression analysis for career adaptability at T2 ($N = 308$).

	B	SD(B)	Beta	R ²
<i>Step 1</i>				
Career Adapt.T1	0.566	0.047	.570***	.325***
<i>Step 2</i>				
Gender	0.042	0.090	.021	
Age	0.005	0.066	.003	
Nationality	0.400	0.124	.150**	
High-school	−0.645	0.124	−.246***	
Parent Ed.	0.004	0.031	.007	.398***
<i>Step 3</i>				
Goals	0.097	0.061	.088	
Capability B.	−0.196	0.101	−.098	
Pos. emotion	0.162	0.046	.162***	
Social support	0.017	0.005	.163***	.450***

Note. Adapt., adaptability; Ed., education; B., beliefs, Pos., positive.

Coding: Gender: female = 0, male = 1; nationality: Swiss = 1, other = 0; high-school: do not attend general high-school = 0, do attend general high-school = 1. All values are for when variables were first entered into the regression.

** $p < .01$.

*** $p < .001$.

Del Bove, & Caprara, 2007) and also was one of the hypothesized outcomes of increase in career adaptability. Hence, including it as a control variable statistically differentiated this analysis from the first one and eventual effects of career adaptability on life satisfaction were estimated independently from its presumed effect on sense of power. Controlling for the effect of emotional disposition is important due to its significant relation to life satisfaction (Pavot & Diener, 1993) and presumed influence on career adaptability. In sum, controlling for these three variables in both analyses allowed stronger causal inferences as to whether increase in career adaptability predicts increase in sense of power and more life satisfaction. It decreased the possibility that effects can be attributed to some third variable which correlates with the assessed measures. In a second step, the socio-demographic variables were entered. Finally, in the last step the influence of career adaptability at T2 was assessed.

Sense of power. The results in Table 3 show that sense of power at T2 was significantly predicted by the first set of control variables, $R^2 = .51$, $F(3,304) = 04.90$, $p < .001$. The squared semipartial correlations showed that the autoregressive effect of the measure alone explained 17% of variance. The socio-demographic variables could not explain significant additional variance, $F(5,299) = 2.05$, $p = .072$. However, as hypothesized, an increase in career adaptability predicted an increase in sense of power above the other variables, $\Delta R^2 = .023$, $F(1,298) = 15.4$, $p < .001$.

Life satisfaction. The results in Table 3 also show that life satisfaction at T2 was significantly predicted by the first set of control variables, $F(3,304) = 51.44$, $p < .001$, which explained 33% variance. The socio-demographic variables explained an additional 3% of variance, $F(5,299) = 2.8$, $p = .016$, but no single significant predictor emerged. As hypothesized, an increase in career adaptability predicted an additional amount of variance in life satisfaction above and beyond the other variables, $\Delta R^2 = .024$, $F(1,298) = 11.56$, $p = .001$.

4. Discussion

Based on Ford's Motivational Systems Theory (MST; Ford, 1992; Ford & Smith, 2007) four motivational predictors of achieving career adaptability were assessed: positive emotional dispositions, goal decidedness, capability beliefs, and social context beliefs. As has been expected, the four variables were significant predictors of achievement in career adaptability over the course of one school year. Supportive social context beliefs emerged as a significant predictor which confirms previous research on the importance of social support and relations in adolescent career development (e.g., Kracke, 2002; Rogers et al., 2008). Also, a positive emotional disposition was a significant predictor of increase in career adaptability over time. This understates the importance of personality in understanding adolescent career development (Rogers et al., 2008). It also adds to the well-established literature on the positive relation of adaptive personality characteristics and advanced states in career decision making and identity development (e.g., Crocetti, Rubini, Luyckx, & Meeus, 2008; Saka & Gati, 2007). The fact that the other two motivational variables did not emerge as single significant predictors could be explained by their shared variance. As the correlation data showed, they related significantly to each other and to more career adaptability at the end of the school-year. In sum, the results support a notion that adolescent career development is affected by a complex interaction of environmental, emotional, and cognitive factors (e.g., Creed & Patton, 2003; Rogers et al., 2008) and imply that MST can be a useful reference to systematically integrate different variables into a common framework.

The study also assessed the effect of different socio-demographic and human capital variables on career adaptability development. The results showed that students with an immigration background show much less increase in career adaptability than Swiss students. Studies in Switzerland showed that adolescents with an immigration background had much more difficulties in finding an apprenticeship after school and attributed these findings to discriminative selection practices

Table 3
Hierarchical regression analysis for sense of power and life satisfaction at T2 ($N = 308$).

	Sense of power T2				Life satisfaction			
	B	SD(B)	Beta	R ²	B	SD(B)	Beta	R ²
<i>Step 1</i>								
Power T1	0.423	0.052	.441***		0.216	0.058	.229***	
Pos. Emotion	0.352	0.045	.344***		0.435	0.050	.435***	
Career Adapt.T1	0.079	0.051	.083	.430***	-0.011	0.056	-.012	.279***
<i>Step 2</i>								
Gender	0.128	0.084	.067		-0.089	0.091	-.048	
Age	0.013	0.060	.010		-0.057	0.066	-.043	
Nationality	0.153	0.114	.060		0.168	0.123	.068	
High-school	-0.112	0.117	-.045		0.109	0.127	.044	
Parent Ed.	0.044	0.046	.045	.442***	0.111	0.050	.116*	.313***
<i>Step 3</i>								
Career Adapt.T2	0.421	0.047	.431***	.562***	0.193	0.056	.202***	.340***

Note. Pos., positive; Adapt., adaptability; Ed., education.

Coding: Gender: female = 0, male = 1; nationality: Swiss = 1, other = 0; high-school: do not attend general high-school = 0, do attend general high-school = 1. All values are for when variables were first entered into the regression.

* $p < .05$.

*** $p < .001$.

among small and medium sized firms or to lower average educational achievement of immigrant youth (Haeberlin, Imdorf, & Kronig, 2005). The results of the present study suggest that immigrant youth might also show more difficulties in career preparation which could explain an additional part of the unequal success in the subsequent transition to vocational training and education. Since no large differences between Swiss and non-Swiss students emerged in the motivational variables, future studies could include a more direct and detailed measure of the exosystem of these adolescents (e.g., family structures) which might explain these differences in career adaptability achievement.

Another inhibiting factor for career adaptability achievement was planned attendance of a general high-school which prepares for later college education and does not require an immanent career choice. Students not pursuing vocational education and training also reported a significantly less supportive social environment for their career development, which indicates that they are more likely to be “left alone” in this process by important others. Given the finding that better career adaptability increases sense of power and promotes well-being, the results would call for a more active support also of future college-bound students to prepare for their careers. The results also underline the importance of the specific educational context on timing of adolescent career development (Reitzle, Vondracek, & Silbereisen, 1998).

On the other hand, parental educational level as a form of human capital did not affect the development of career adaptability. However, it was related to higher sense of power and life satisfaction. These results imply that it is an asset in terms of well-being for Swiss adolescents to have higher educated parents which, however, does not translate into better career preparation. Also, gender and age did not affect career adaptability development which adds to the inconclusive literature regarding gender differences in adolescent career development (Patton & Creed, 2001) and supports the notion that within a given grade-level chronological age is not significantly related to variables of career development (Hirschi & Läge, 2007a).

The second part of the analyses investigated the effect of career adaptability on development of sense of power and on well-being in terms of more life satisfaction as components of positive youth development (Lerner & Lerner, 2006; Scales & Leffert, 1999). As hypothesized, a higher achievement of career adaptability over time significantly predicted development of sense of power and showed an expected significant positive relation to life satisfaction. Although both effects were not large according to general standards, it has to be noted that both variables are very general measures and presumably influenced by a vast number of different factors (e.g., Pavot & Diener, 1993). The finding that the single aspect of increase in career adaptability, controlled for basic personality dispositions and different socio-demographic variables, significantly predicts sense of power and life satisfaction therefore seems meaningful and of practical relevance. The results support the positive relation of career adaptability development and positive youth development and underline the important role of adolescent career preparation not only for successful career transitions but also as directly related to well-being (Skorikov, 2007a). They also strengthen the argument that achievement of career adaptability can be seen as an important indicator of thriving in adolescence which in turn promotes the development of core components of positive youth development and results in greater well-being.

4.1. Limitations and implications

One limitation of the present study was that social context beliefs and positive emotional disposition were assessed at the second measurement point yet were treated as antecedents of achievement in career adaptability. For context beliefs, the intention was to measure the amount of perceived social support during the school year which could only have been done in retrospection. For emotional disposition, the reason to assess the respective variables at the end of the school year was based on the theoretical consideration that these traits are not to be expected to change very much over this short time (Costa & McCrae, 1997) but that a more valid score from the inventory would result if the students were somewhat older (Roth, 2002). Final limitations include the use of all self-report measures, which restricts the validity of the study due to shared methodological variance in all assessed constructs, and the use of a convenience sample, which limits the generalizability of the results.

Despite these limitations, the results of the study support the notion of career adaptability resulting from an active engagement in meaningful person–environment interactions. Assisting students prepare for their vocational future could be an important focus on programs that focus on positive youth development. In line with Motivational Systems Theory, respective programs should try to simultaneously address emotions, goals, capability beliefs, and context beliefs (cf. Ford, 1992). However, interventions should also attempt to improve the actual environmental conditions of youth in order to facilitate development of career adaptability, particularly for students with increased difficulties in career transitions. The present study can provide an empirical reference of the importance of these factors for career counseling and applied developmental science.

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