



Adaptation of career goals to self and opportunities in early adolescence

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ABSTRACT

Development of career goals that are adapted to self and opportunities is a central component of adolescent career preparation. The present longitudinal study (conducted throughout the eighth grade with three assessment points) investigated how 330 Swiss adolescents simultaneously adapt career goals to interests, scholastic achievement and environmental opportunities. Results demonstrated that students increasingly adapt their goals to the environment. Mean adaptation to environment related positively to degree of adaption to interests and achievement. Increased adaptation to environment over time related to increased adaptation to achievement but to decreased adaptation to interests. Gender, attended school type and nationality moderated adaptation processes. Structurally disadvantaged students (girls, lower requirements school track, immigrant students) reported more conflict in aligning adaptation to environment with adaptation to interests.

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1. Introduction

The second decade of life is a period when adolescents increasingly become engaged in intentional self-development and self-determination, and personal goals become particularly important for this process (Nurmi, 2004). Goal setting in adolescence is an important development task of career preparation and vocational identity development (Erikson, 1968). Vocational and educational aspirations are future oriented and set the motivational stage for action and achievement (Ford, 1992). As such they are conceptually different from interests since they also include motivational aspects (Silvia, 2001). In line with this reasoning, empirical research showed that adolescents' vocational goals are strong predictors of occupational attainment in adulthood (Schoon & Parsons, 2002).

A core component of successful career preparation in adolescence is the development of career adaptability, that is "... 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). Formulating career and educational goals that are adapted to the self and to environmental opportunities and constraints is commonly seen as a central aspect of adolescent career adaptability (Super, 1990). The development and adaptation of goals can be seen as a dynamic process, where adolescents have to select goals according to personal preferences and environmental opportunities and limitations, optimize their behavior to achieve those goals, and compensate and adjust if goals become unattainable or unattractive (Lerner, Freund, De Stefanis, & Habermas, 2001; Nurmi, 2004). One framework to describe goal development and adaptation which can be usefully applied to vocational development is the comprehensive model of human behavior and personality proposed in the Living Systems Framework (LST) by Ford (1987), Vondracek and Porfeli (2008). It describes goal adaptation as resulting from an interaction of self-evaluative thoughts (e.g., evaluating personal interests, values, abilities), and environmental evaluations (e.g., evaluating opportunities or available social support). Goal selection and adjustment are also based on information processing (e.g., planning, decision-making) and information storage. According to LST, goals are

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therefore adjusted to evaluations in feedback processes. They also influence behavior, evaluations, and selective perceptions through feedforward (i.e., future-oriented, anticipatory) processes.

Unfortunately, such a dynamic conception of goal development and adaptation is not adequately accounted for in most prominent theories of adolescent career development. For example, the theory of [Gottfredson \(1981, 2002\)](#) describes vocational aspiration development in adolescence as a process of circumscription and compromise, which unfolds along relatively circumscribed age-dependent stages. The theory states that children and young adolescents (up to age 14) circumscribe their career aspirations according to perceived gender type, prestige, and size and power of vocations. The theory further assumes that adolescents in the last stage (after age 14) begin to select and adjust (compromise) their aspirations according to perceived sex roles, social evaluation, and personal and environmental characteristics. The theory does not offer, however, a detailed account of how these selection- and compromise-processes unfold in the last stage, and several propositions regarding these processes were not confirmed by empirical studies ([Blanchard & Lichtenberg, 2003](#); [Henderson, Hesketh, & Tuffin, 1988](#); [Hesketh, Elmslie, & Kaldor, 1990](#)). [Super's \(1990\)](#) life-span, life-space theory of career development states that adolescents in the exploration stage (ages 14–24 years) start to crystallize their vocational goals and preferences based on increased self-understanding and information and knowledge about the world of work. This should lead to a progressive narrowing of career options from fantasizing about possible careers to the identification of tentative options to a final decision. [Super \(1990\)](#) saw this career choice as an implementation of one's self-concept. However, the theory also does not provide specific references as to how adolescents adapt their aspirations during this stage to personal and environmental characteristics. Another limitation of both Gottfredson's and Super's theories is that they assume predetermined, age-dependent stages along which adolescents develop and adjust their vocational goals, which render them unable to fully account for the dynamic interaction of person and environment in human development (see [Vondracek, Lerner, & Schulenberg, 1983](#), for a critique).

Another prominent theory of vocational interests and goals development states that goals emerge primarily out of interests but are also influenced by self-efficacy beliefs, outcome expectations, and the proximal environment ([Lent, Brown, & Hackett, 1994](#)). Empirical research based on this social-cognitive model showed that interests exert the major direct influence on vocational goals selection and that the effect of the other factors is largely mediated by interests ([Lent, Brown, Nota, & Soresi, 2003a](#); [Lent et al., 2003b](#)). The SCCT model also includes the notion of feedback processes, where goals lead to behavior and learning experiences which, in turn, can influence subsequent goal development. This important aspect of the theory has, however, not received much theoretical and empirical attention.

1.1. Review of research on career goal adaptation

Longitudinal research on the vocational goal adaptation process in adolescence is clearly needed to increase our conceptual and empirical understanding of how adolescents master this important developmental task of career preparation. However, there are only a few longitudinal studies on how students in adolescence adapt their career goals and aspirations. A study by [Heckhausen and Tomasik \(2002\)](#) showed that German adolescents in tenth grade adjusted their aspirations from ideal vocations to interesting vocations and to actual applied apprenticeships and matched their school performance to the social prestige of the apprenticeship when confronted with a developmental deadline to find an apprenticeship after compulsory school. In a related study it was shown that German students, who reported more adaptive control strategies in terms of internal and external control in their final grade, also applied a more adaptive process of career goal adaptation by starting with high aspirations and subsequently downgrading them as the end of school drew nearer. Similarly, [Armstrong and Crombie \(2000\)](#) showed that among U.S. high-school students in eighth through tenth grade, students increasingly reduced the discrepancy between aspired and expected future occupations, mainly by reducing their aspiration level and somewhat less by changing their expectations. In a 10-year longitudinal study among US students, [Helwig \(2001\)](#) showed that students from second to twelfth grade decreased the social value of their career aspirations and showed an increased attention to internal, personal factors. Helwig also reported a decrease of fantasy aspirations over time. [Rojewski and Yang \(1997\)](#) reported that the prestige of U.S. adolescents' career aspirations (in terms of expected occupation at age 30) remained relatively stable from eighth to twelfth grade. Prestige level was influenced by current math achievement and self-evaluations, with this effect diminishing with increasing grade level.

In sum, these studies support the general theoretical notion that adolescents become increasingly realistic and adapted in their career goals over time, possibly also due to an increased knowledge of the world-of-work ([Walls, 2000](#)). A critical point with these studies is that an increase in realism and adjustment was measured only by changes in the social or personal value and prestige of the aspirations and the adjustment of aspired to expected careers over time. As such, they did not directly assess how adolescents manage to adapt their aspirations to both personal and environmental characteristics, which would be of central importance in examining notions of successful career preparation and career adaptability as reviewed above. Also, prominent models of career decision-making (e.g., [Gati & Asher, 2001](#)) imply that adapted career goals should be based on at least three aspects: (1) correspondence to personal interests, (2) correspondence to personal abilities, and (3) correspondence to actual opportunities and restrictions in the environment. However, there has been no study to our knowledge which assessed how adolescents manage to simultaneously adapt their vocational and educational goals to these different requirements. Finally, due to the contextual nature of career development ([Vondracek & Reitzle, 1998](#)), more studies in different educational settings and age groups are needed to increase our understanding of the developmental-contextual nature of adolescent career development and goal adaptation.

1.2. Present study and hypotheses

The present longitudinal panel study investigated vocational goal adaptation processes among Swiss students over three measurement points at the beginning (T1), middle (T2), and end (T3) of the eighth grade. The Swiss educational system places a strong emphasis on vocational education and training. Approximately 70% of all students continue to vocational education and training after mandatory school by the end of ninth grade (Bundesamt für Berufsbildung und Technologie, 2007). These students have to apply for an apprenticeship between the end of eighth grade and the beginning of ninth grade. The minority of students that is college bound and continues to a general high-school, also has to apply for and complete entry exams to these schools during this time period. The timing of this important vocational/educational transition makes the eighth grade in Switzerland the focus of career preparation, where students are expected to formulate adapted vocational and educational goals for their imminent future within a relatively short amount of time and at a comparatively young age.

The goals and research questions of the present study were threefold:

1. How do Swiss adolescents simultaneously adapt their vocational and educational goals to personal interests, individual scholastic achievement, and general environmental opportunities and constraints that reflect available vocational training and education? It was hypothesized that students show a significant adaptation of goals to personal interests, to scholastic achievement, and to environmental opportunities over this critical school year.
2. How are those three aspects of career goals adaptations related to each other? Are they relatively independent processes or do they show meaningful relations? It was expected that on a general level the three domains of adaptation all related positively as a sign of general adaptability of a student since adaptation along all three dimensions is theoretically considered essential for adapted career goals.
3. How are these adaptation processes related to gender, attended school-track and nationality? Research in Switzerland showed that these three demographic factors exert a major influence in the transition from mandatory school to post-secondary vocational training and education. The findings implied that female students, students with an immigration background (i.e., no Swiss nationality), and students from school tracks with lower academic requirements experience more difficulties in finding an apprenticeship after school (Haeberlin, Imdorf, & Kronig, 2004; Haeberlin, Imdorf, & Kronig, 2005; Meyer, 2004). One reason for this fact has been found in discriminating selection practices of some small and medium-sized apprenticeship firms (Haeberlin et al., 2005). However, whether gender, school-track, and nationality influence the vocational goal adaptation process has not been investigated. Based on available research showing the effect of these socio-demographic factors on adolescent career development (e.g., Hill, Ramirez, & Dumka, 2003; Patton & Creed, 2007), it can be expected that they also exert a significant influence on vocational goal development and adjustment. If these groups of students would indeed differ in their degree and process of vocational and educational goal adaptation, this could have important implications for career preparation and would help to more fully understand reported inequalities in the transition from school to post-secondary education in Switzerland and other countries.

Based on the Swiss findings, it was hypothesized that female, non-Swiss, and lower academic school-track students would also experience more difficulties in adapting their vocational goals to interests, achievement, and environmental opportunities and constraints than male, Swiss, and higher academic school-track students. It was also hypothesized that the relations among the three adaptation processes differ according to group. Specifically, it was expected that for female students adapting goals to interests would relate negatively to adapting goals to environmental opportunities. This assumption was based on the observation that within the Swiss vocational education system significantly fewer training opportunities exist that correspond to typically female interests (social, artistic) than to typically male interests (realistic) (Hirschi, submitted for publication), which would result in a conflict of adapting goals to interests or to environmental opportunities for girls but not boys. It was also expected that for students in basic school-tracks (but not advanced school-tracks) adaptation to interests would relate negatively to adaptation to environment since a number of educational and vocational possibilities are not available for lower track students, which could require more compromise regarding adaptation to interests or environmental opportunities for this group. Finally, it was expected that non-Swiss students (but not Swiss students) would show a negative relation of goal adaptation to interests and to environment since it was speculated that they would more often have career interests that would not directly translate into the different cultural context and available opportunities in Switzerland.

2. Method

2.1. Participants

Eighth grade students from five school districts in a rural area of the German speaking part of Switzerland participated in the study ($N = 330$). At the first time of measurement their ages ranged from 12 to 16 years ($M = 14.1$, $SD = 0.7$), half were female ($n = 165$), 82.7% had a Swiss nationality; the others had nationalities from South-Eastern Europe (11.7%), Western Europe (1.8%) or other countries (2.8%). As usual for this grade-level in Switzerland, about two thirds (63.6%) attended a school-track with advanced requirements, the others a track with basic requirements. Within the Canton (State) of residence

of the study participants the assignment to different tracks begins in seventh grade and is based on the scholastic performance in elementary school and the judgments of teachers. Different tracks have important implications for the transition to post-secondary education since some fields of vocational education and general high-school as a preparation for college are only available to students from advanced tracks. Fifty-three participants (16.1%) had passed the entry examination for general high-school at the beginning of the second semester in eighth grade and planned to proceed to general high school in ninth grade.

2.2. Measures

Demographic questionnaire. Each student was asked to indicate their gender, age in years, attended school-track (advanced or basic) and nationality. Nationality was coded as either Swiss or non-Swiss. If a student had a Swiss and a foreign nationality ($n = 8$) he or she was coded as Swiss.

Career goals. As is the case in other career goals research (Dik, Sargent, & Steger, 2008; Emmons, 1996; Heckhausen & Tomasik, 2002; Judge, Bono, Erez, & Locke, 2005; Salmela-Aro, Aunola, & Nurmi, 2007), we applied an idiographic approach to goal assessment by asking students to name their current educational and vocational goals, which they eventually planned to pursue after finishing ninth grade, in a free listing form. Participants named between 0 and 13 different goals at T1 ($M = 3.2$, $SD = 1.7$), 0 and 8 at T2 ($M = 2.84$, $SD = 1.3$), and 0 and 12 at T3 ($M = 2.59$, $SD = 1.5$). At each measurement point the majority of students named 2 or 3 goals (T1 56.3%, T2 62.8%, T3 54.9%).

Adaptation to interests. Goals were transformed into three-letter RIASEC codes according to the Dictionary of Occupational Codes (Swiss edition; Jörin, Stoll, Bergmann, & Eder, 2004). The goal of attending general high-school was not assigned a RIASEC code since it does not correspond to a specific interest pattern. To obtain an inventoried interest code, students were administered the *Revised General Interest Structure Test* (Allgemeiner Interessen Struktur Test – Revidierte Version; Bergmann & Eder, 2005), which is a well established and frequently used interest inventory in the German speaking countries (Switzerland, Germany, Austria). Students are presented with 60 items, each describing a particular activity in one of Holland's six interest domains: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC), for example, "working on a construction site" or "learning a foreign language". Each area is assessed with 10 items, with answers provided on a 5-point Likert scale ranging from (1) *not at all interested* to (5) *very interested*. The inventory's construct validity has been supported, e.g., high correlates to the German language adaptation of the Self Directed Search (Holland, 1994; Jörin et al., 2004). These authors have also documented expected differences between people employed in different vocations, as well as significant relations to basic personality traits. In addition they have reported reliability estimates (Alpha) with adolescents ranging from .82 to .87 and 1 month re-test stabilities of .85 to .92 (Bergmann & Eder, 2005). As a measure of correspondence of goals to interests, congruence between goals and interest inventory profile was calculated for each named career goal by the *C-index* (Brown & Gore, 1994), which is currently cited as the best available index of congruence (c.f. Eggerth & Andrew, 2006). The index assigns a value from 0 to 18 based on the similarity of the two three-letter codes according to the RIASEC hexagon, with higher values indicating more congruence. For both indices the mean score over all named goals was taken as the final congruence score for a student. If the interest profile was tied for the first three ranks, all possible combinations between the interest profiles and the goals were calculated and the mean was taken as the final score of congruence.

Adaptation to achievement. Students were asked to report their obtained scores in a standardized scholastic achievement test, which is administered at the beginning of the second semester in the eighth grade thorough their Canton (State) of residence (c.f. www.stellwerk-check.ch). The test is a web-based adaptive testing system that assesses competencies in Mathematics, Science, German, French, and English. For the purpose of this study, only the scores in Mathematics and German language were obtained since these two subjects are considered core competencies for the school-to-work transition (Moser, 2004). The sum-score of the two subjects was taken as the indicator of a student's scholastic achievement.

Next, each goal was assigned a value for its scholastic demands. One point was assigned for vocational education tracks that can be directly pursued after school from any school track. Two points were assigned if the chosen vocational education track can only be pursued with high marks in the basic, required classes. Three points were assigned for vocational education tracks that can only be pursued after finishing advanced requirements. Four points were assigned for choosing vocations that require additional professional training after finishing an initial 3–4 year apprenticeship. Five points were assigned if the chosen vocation is based on a college degree requiring 3 or more years. The information to classify the occupations was retrieved from the descriptions of their educational requirements as listed in a comprehensive public Swiss database with job descriptions (www.berufsberatung.ch).

The average level of educational requirement associated with a student's career goals was calculated by taking the sum score of all goals requirements and dividing this value by the number of named goals. Adaptation of goals to scholastic achievement was calculated by squaring the difference of the standardized value for goal level and the standardized value of scholastic achievement and then taking the square root of this term. This value was inversed so that higher values indicate more adaptation of goal level to achievement.

Adaptation to environment. The adaptation of each goal to the opportunity structure in the environment was calculated by using two criteria (c.f. Hirschi, in press): (1) Correspondence to one of the 233 available types of vocational education or an existing advanced school which can be pursued directly after finishing school from the specific school-type of the student (certain kinds of vocational education and advanced schools can only be pursued when finishing a school-type with advanced requirements). One point was assigned if the goal fulfilled these requirements and zero points were assigned if

it did not. (2) Number of possible companies offering apprenticeships in the chosen occupation within the Canton (State) of residence. For this criterion between one to four points for each goal was assigned (1 point for 1–3 possible places for apprenticeships in the Canton; 2 point for 4–33 possible places; 3 points for 34–330 possible places; 4 points for 331–3330 possible places and for general high-school). A logarithmic function was applied because the number of places is extremely positively skewed with most occupations having only few places and only some having many. The values from criteria (1) and (2) were multiplied, resulting in a total value for the correspondence of this career goal ranging from 0 to 4 points. The correspondence value for each named career goal was then summed up and divided by the total number of named career goals by a given student. This resulted in a score from 0 to 4, with higher values indicating more correspondence of a student's career goals to the opportunity structure in the environment. Hirschi (in press) provided support for the construct validity of this measure among Swiss students in seventh grade, with significant positive relationships to degree of reported career planning and career exploration.

2.3. Procedure

Teachers of the selected schools were contacted and asked if they would participate with their students in the research project. All invited teachers agreed to participate and students were then informed about the general nature of the study. At the same time, passive informed consent was acquired from the participants' parents/guardians. Data collection took place at the beginning of eighth grade (T1), approximately five months later at the end of the first semester (T2), and at the end of eighth grade (T3), approximately 10 months after the first measurement point. All questionnaires were completed in the classroom under the supervision of the teacher during an ordinary school session. Although participation was voluntary, virtually all students present at the time of data collection completed the questionnaires. At T1, students completed the demographic questionnaire, named their current career goals, and completed the interest inventory; at T2 they again named their current career goals; at T3 they named their current career goals, completed the interest inventory again, indicated their obtained scores on the scholastic aptitude test and reported whether they had passed the entry examination for general high school.

3. Results

3.1. Preliminary analyses

Missing cases. Of the group of 330 students 2 (0.6%) did not participate at T1, 18 (5.5%) were missing at T2, and 22 (6.7%) did not participate at T3 due to absence at the time of data collection. No student missed more than one measurement, resulting in 42 (12.7%) students with incomplete data. These students did not differ in gender, $\chi^2(1) = 0.98$, $p = .322$, $\phi = .055$, or nationality, $\chi^2(1) = 0.11$, $p = .745$, $\phi = .018$, but were more likely to be in the basic school-tracks, $\chi^2(1) = 7.04$, $p = .008$, $\phi = .146$. In addition, 2 (T1), 3 (T2), and 1 (T1) student(s) did not name a career goal at one measurement point which excluded them from some analyses.

Students continuing to general high-school. The 53 students attending general high-school after eighth grade were all from advanced school tracks, and more likely to be Swiss nationals, $\chi^2(1) = 5.7$, $p = .017$, but did not differ in gender, $\chi^2(1) = 0.8$, $p = .368$ from students continuing to vocational education and training. Students attending high school showed significantly less mean adaptation to environment, $M = 1.4$, $SD = 0.73$ versus $M = 2.5$, $SD = 0.69$, $t(306) = 10.0$, $p < .001$, $d = 1.47$, but no significant difference in adaptation to achievement or interests compared to the other students. Since students attending general high-school after eighth grade did not need to adapt their goals to the opportunity structure in the vocational educational system they were excluded from all subsequent analyses regarding the adaptation to environment.

Goal prioritization. A first analysis was conducted to see whether students would increasingly prioritize their goals over the course of the school year. A repeated measures ANOVA with number of career goals at T1, T2, and T3 as dependent variables was conducted. Among students not continuing to high school, $F(1,237) = 16.68$, $p < .001$, $\eta^2 = .066$, and those continuing to high school, $F(1,51) = 36.85$, $p < .001$, $\eta^2 = .419$, the results showed a significant linear effect of time indicating a decrease in number of goals and an increase in prioritization over time.

Goal educational level. A second preliminary analysis was undertaken regarding educational career goal level. A repeated measures ANOVA, including a polynomial test for quadratic effect with mean educational level of goals was conducted. Among the majority not continuing to high school the results showed a significant linear, $F(1,231) = 27.43$, $p < .001$, $\eta^2 = .106$, and quadratic, $F(1,231) = 8.81$, $p = .003$, $\eta^2 = .037$, effect of time indicating a significant decrease in average educational level of career goals over time with a particularly steep decrease in the first half of the school year. Conversely, the minority continuing to high school showed no significant linear trend, $F(1,51) = 3.42$, $p = .070$, $\eta^2 = .063$, indicating that they did not significantly change their educational aspiration level over time.

3.2. Adaptation over time

To test the hypothesis that students would, on average, show an increase in adaptation of goals to interests, achievement, and environmental opportunities, three repeated measures ANOVAs with adaptation to achievement and environment at T1,

T2, and T3 were conducted. Since interests were only assessed at T1 and T3, adaptation to interests was only assessed with a linear trend for these two points in time.

The results for interests (T1: $M = 11.4$, $SD = 2.9$; T3: $M = 11.5$, $SD = 2.9$) did not show a significant effect of time, $F(1, 256) = 0.5$, $p = .478$, $\eta^2 = .002$, indicating no significant increase in adaptation of goals to interests over the school year.

For adaptation to achievement the results (T1: $M = -0.75$, $SD = 0.56$; T2: $M = -0.71$, $SD = 0.53$; T3: $M = -0.69$, $SD = 0.51$) did not show a significant linear, $F(1, 261) = 3.6$, $p = .058$, $\eta^2 = .014$, or quadratic, $F(1, 261) = 0.1$, $p = .718$, $\eta^2 = .001$, effect indicating no significant increase in adaptation of goals to scholastic achievement over time.

For the analysis for adaptation to environment (excluding students attending general high-school) the results (T1: $M = 2.14$, $SD = 0.90$; T2: $M = 2.52$, $SD = 0.83$; T3: $M = 2.66$, $SD = 0.87$) showed a significant linear, $F(1, 232) = 31.3$, $p < .001$, $\eta^2 = .225$, and quadratic, $F(1, 232) = 6.1$, $p = .014$, $\eta^2 = .025$, effect of time, indicating a significant linear increase in adaptation of goals to environmental opportunities over time with a particularly steep increase in the first half of the school year.

3.3. Relation of adaptation processes

To assess how the three adaptation processes are related to each other, three linear change scores were calculated by subtracting the score at T1 from the score at T3 for each adjustment measure. Three mean scores of adaptation were calculated by taking the mean of the three scores at T1, T2, and T3 for achievement and environment and at T1 and T3 for interests, respectively. Table 1 shows the relationships among the three change and mean scores for the whole sample. The results showed that an increase in adaptation to environment was negatively related to an increase in adaptation to interests but positively to an increase in adaptation to achievement. On the mean level, students who scored higher in adaptation to the environment also scored higher in adaptation to interests and achievement. Adaptation to interests was not related to adaptation to achievement.

3.4. Relation of socio-demographic variables and adaptation

Mean adaptation. The three mean scores for adaptation were compared between the three groups with Multivariate Analyses of Variance (MANOVA). The results showed that the three adaptation means differed significantly between the two school-tracks, $F(3, 234) = 12.19$, $p < .000$, $\eta^2 = .135$. Post-hoc t -tests showed that students in basic school tracks showed higher mean adaptation to environment ($M = 2.72$, $SD = 0.48$) than students in advanced tracks ($M = 2.26$, $SD = 0.75$), $t(248) = 6.0$, $p < .001$, $d = 0.67$. The three adaptation levels also differed by gender, $F(3, 243) = 10.5$, $p < .001$, $\eta^2 = .119$. Post-hoc t -tests showed that boys scored higher in adaptation to interests (boys $M = 11.94$, $SD = 2.29$; girls $M = 10.76$, $SD = 2.15$), $t(326) = 4.81$, $p < .001$, $d = 0.51$, and in adaptation to environment (boys $M = 2.61$, $SD = 0.56$; girls $M = 2.29$,

Table 1
Pearson correlations and partial correlations among the three goal adaptation processes.

	All participants ($n = 281$)						Gender					
	1	2	3	4	5	6	1	2	3	4	5	6
Increase												
1. Interests	—						—	.091	-.024	.143	-.001	-.006
2. Achievement	-.110	—					-.192*	—	.042	.184	.118	.160
3. Environment	-.152*	.159*	—				-.258**	.224*	—	-.071	.124	.019
Mean												
4. Interests	-.011	-.004		—			-.101	-.068	.062	—	.069	.224*
5. Achievement	-.062	.025	.079	.014	—		-.066	-.105	.033	-.037	—	.055
6. Environment	-.017	.019	-.002	.136*	.185**	—	.056	-.041	-.010	.109	.243**	—
	School track						Nationality					
	1	2	3	4	5	6	1	2	3	4	5	6
Increase												
1. Interests	—	-.108	-.033	.063	-.020	.018	—	-.099	-.085	-.001	-.084	.021
2. Achievement	-.040	—	.063	.017	.027	.000	-.024	—	.083	-.033	-.010	-.009
3. Environment	-.230*	.225*	—	.180	.135	.115	-.218	.353*	—	-.004	.068	.045
Mean												
4. Interests	-.057	-.068	-.319**	—	-.002	.143	.055	-.025	-.253	—	-.043	.123
5. Achievement	-.098	-.071	.050	.057	—	.140	.195	.009	.262	.148	—	.122
6. Environment	.048	.137	-.227*	.216*	.215*	—	.030	.339*	-.096	.254	.362*	—

Note. Below diagonal girls ($n = 131$), basic school track ($n = 99$), non-Swiss students ($n = 41$) above boys ($n = 125$), advanced school track ($n = 157$), Swiss ($n = 215$) students.

Pearson correlations are reported for all participants, partial correlations are reported for gender, school track, and nationality subgroups.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

$SD = 0.77$), $t(228) = 3.73$, $p < .001$, $d = 0.46$. Finally, there was also a difference regarding nationality, $F(3, 234) = 2.8$, $p = .040$, $\eta^2 = .035$. Post-hoc t -tests showed that Swiss students scored higher in adaptation to interests (Swiss $M = 11.53$, $SD = 0.233$, non-Swiss $M = 10.47$ $SD = 1.86$), $t(326) = 3.19$, $p = .002$, $d = 0.46$.

Change in adaptation. To assess whether students would differ in their linear degree of goal adaptation, three repeated measures ANOVA with adaptation to interests/achievement/environment at T1 and T3 with gender, school-track, and nationality as between-subjects factors were calculated. For adaptation to interests, a significant interaction effect of school-type with time emerged, $F(1, 273) = 6.2$, $p = .013$, $\eta^2 = .022$, indicating that students in classes with advanced requirements showed a stronger increase over time. For adaptation to achievement there was again a significant interaction effect of school and time, $F(1, 274) = 5.1$, $p = .025$, $\eta^2 = .018$, indicating that students in classes with basic requirements showed a stronger increase over time. Finally, for adaptation to environment no significant interaction effects occurred.

Relationships among adaptations. To estimate whether the three adaptations were related differently to each other depending on gender, school-track, and nationality, partial correlations divided by group were calculated, controlling for the other two socio-demographic variables. Table 1 shows the partial correlations, indicating that for girls but not boys, increase in adaptation to interests was negatively related to increase in adaptation to environment. Also, only for male students was average adaptation to environment positively related to mean adaptation to interests, while only for female students average adaptation to achievement was positively related to adaptation to environment. The comparison between school-tracks showed that only for students in basic tracks was increase in adaptation to environment negatively related to increase in adaptation to interests but positively to increase in adaptation to achievement. Also, only for basic track students was mean adaptation to environment positively related to mean adaptation to achievement and interest. Mean adaptation to environment was significantly related to mean adaptation to achievement only for non-Swiss students. The expectation that increase in adaptation to interests would be negatively related to increase in adaptation to environment only for non-Swiss students was in the expected direction but not significant.

4. Discussion

The results show that students increasingly prioritize their goals over the course of the school-year and become more focused on fewer goals over time. This finding is true for students imminently facing the transition to vocational education and training (VET) and those continuing to general high school. However, there were clear differences between those two groups regarding changes in educational aspiration level and adaptation to environment. In line with previous findings (Reitzle & Silbereisen, 2000; Reitzle, Vondracek, & Silbereisen, 1998; Vondracek, Silbereisen, Reitzle, & Wiesner, 1999), students confronted with a more imminent career transition show more adaptation in those areas than those who can postpone their career choice. For the majority continuing to VET, there was a significant reduction of the mean educational level of goals which is in line with previous findings (Heckhausen & Tomasik, 2002; Helwig, 2001). However, contrary to what was expected, no significant increase in adaptation to interests occurred over time, and the adaptation to scholastic achievement was in the expected direction but not large enough to become statistically significant. Only the adaptation to environmental opportunities showed a strong increase, which indicates that this area is where new learning experiences, particularly about the world-of-work, exert the strongest influence on goal adaptation. The nonsignificant increase in the other two areas could be explained by the fact that the study assessed a limited time-frame of 10 month within which only limited variability in adaptation can occur. Also limiting this variability is the fact that students started with goals already fairly adapted to interests and achievement from the beginning of the school year. Their mean level of congruence between goals and interests was, with 11.4 on the C-index (Brown & Gore, 1994), already reasonably congruent with interests. Also, students in basic school tracks already had a considerably lower mean educational level reflected by their goals than students from advanced tracks ($d = 1.16$), indicating a fair degree of initial adaptation of goals to achievement among the study participants. These findings contradict notions of adolescent career development that state that adolescents would only start to adapt their aspirations to factors of personal self and realistic environmental constraints after age 14 (Gottfredson, 1981; Super, 1990).

The relations among the three adaptation processes showed that increase in adaptation to achievement related positively to increase in adaptation to environment. Adaptation to interests however, related negatively to increase in adaptation to environment, which was particularly prevalent among some subgroups as discussed below. These findings indicate that adaptation to achievement and to environment are closely related, while adaptation to interests is relatively independent or even contradicting the other two adaptation processes. An explanation for this finding can be seen in the fact that adaptation to environment consists of compromises in goals since the environmental opportunities cannot directly be changed according to individual goals of a student. Also, scholastic achievement could be difficult to adjust to goals, although some plasticity in this could be acknowledged. Personal interests, however, could be easily adapted to existing goals and one can expect a reciprocal influence of the two according to living systems theory (Ford, 1987). This line of reasoning implies that adaptation to environment and achievement largely consists of compromising one's goals while adaptation to interests can be a more dynamic reciprocal process, which distinguished these adaptation processes on a conceptual level.

The results further showed that mean levels of adaptation to interests, achievement, and environment generally related positively, which implies that students who perform better in one adaptation area were more likely to also perform better in the other adaptation areas. This supports the notion that goal adaptation is an expression of the general career adaptability of a student.

4.1. Adaptation and socio-demographic variables

Regarding the effects of gender, the results supported the assumption that boys would show a better adaptation of goals in terms of interests and environment than girls. The relations among the change processes also showed that for girls, but not boys, the mean level of adaptation to achievement related positively to mean level of adaptation to environment. This implies that for this group, compromises to relatively stable realities in terms of environmental opportunities and general school performance are closely related and possibly form a common construct of readiness to compromise, which is not present among boys. Confirming the hypotheses, for girls but not boys, increase in adaptation to interests related negatively to increase in adaptation to environment. These findings support the notion of an increased conflict for girls to adapt goals to an environment which might not correspond to existing interests due to limitations in available apprenticeships in certain interest areas. Supporting the privileged position of boys in this regard is the finding that only for boys, but not girls, mean adaptation to interests related positively to mean adaptation to environment.

Regarding nationality, Swiss students showed a better mean adaptation of goals to interests compared to non-Swiss adolescents but not to environment as expected. The two groups of nationalities also did not differ in their change of adaptation over time, which suggests that students with an immigration background are equally able to adapt their goals to environmental opportunities and constraints, while reporting more difficulties in setting goals which correspond to their interests. One possible explanation might be that it is culturally more valued to have vocational goals which correspond to personal interests for Swiss students than it is for non-Swiss students who place more emphasis on the correspondence of goals to environmental possibilities.

Also unexpected was the finding that students from lower academic school tracks reported better mean adaptation to environment than students from advanced school tracks. Basic track students also showed more increase in adaptation to achievement over the school year while advanced track students increased more in adaptation to interests compared to the other group. These results could be explained by the fact that students from basic tracks experience more pressure to adapt to the realities in their environment which could compromise their adaptation to interests compared to advanced track students. Lower track students possibly also received more assistance in the goals adaptation process to environment from classroom teachers compared to advanced track students because teachers are aware of their more challenging situation. Advanced track students were also more likely to aspire to post-secondary education, which would delay their ultimate occupational choices and result in less correspondence to the environment regarding imminent possibilities after ninth grade as measured in the present study. Finally, for students in basic school tracks, increase in adaptation to interests related negatively to increase in adaptation to environment, supporting the assumption of a conflict between personal interests and limitations in apprenticeships due to required scholastic achievement.

4.2. Limitations and implications

Limitations of the study are that adaptation to environment was only assessed in terms of correspondence to available vocational education and training. This was necessary to quantify the existing opportunities in the labor market but excludes possibly realistic options which could be pursued in post-secondary education. Also, in assessing the adaptation to achievement, the study relied on a self-report of a scholastic achievement test. The meta-analysis by Kuncel, Crede, and Thomas (2005) showed that such reports might be biased and some caution is therefore warranted regarding those results.

The theory implication of the results suggest that, contrary to Super's (1990) position, the process of adaptation of aspirations to self and environment can be relatively rapid and does not need to be extended over a period of ten years if the educational system requires a different timing, as is the case in Switzerland (see Heckhausen & Tomasik, 2002, for a similar finding in Germany). The findings also point to the important distinction between compromising goals to relatively stable personal and environmental restrictions and adapting goals to interests. Especially for groups whose traditional interests are not well represented in environmental opportunities, these different aspects of adaptation are important to distinguish. Further research could attempt to more closely examine how adolescents master this challenge within different cultural contexts. It also points out that the notion that adolescents mainly compromise aspirations regarding gender, prestige, or interests (Gottfredson, 1981) is too restricted and might, in fact, only represent one aspect of adaptation referring to self as represented in interests (Hesketh et al., 1990) while not fully accounting for the important tradeoff between adaptation to self and environment. Future theoretical and empirical work should try to explain the dynamics in those compromises more closely, for example, by investigating antecedents and consequences of different degrees and processes of such compromise. One useful theoretical framework for this purpose might be the Selective Optimization with Compensation (SOC) model by Baltes and colleagues (e.g., Freund & Baltes, 2002), which distinguishes processes of goal selection, optimization of behaviors to reach selected goals, and behaviors of compensation in case goals cannot be achieved.

References

- Armstrong, P. I., & Crombie, G. (2000). Compromise in adolescents' occupational aspirations and expectations from grades 8 to 10. *Journal of Vocational Behavior*, 56, 82–98.
- Bergmann, C., & Eder, F. (2005). *Allgemeiner Interessen-Struktur-Test. Revidierte Fassung (AIST-R) [General-Interest-Structure-Test. Revised Version]*. Weinheim: Verlag Beltz.

- Blanchard, C. A., & Lichtenberg, J. W. (2003). Compromise in career decision making: A test of Gottfredson's theory. *Journal of Vocational Behavior*, 62, 250–271.
- Brown, S. D., & Gore, P. A. (1994). An evaluation of interest congruence indices: Distribution characteristics and measurement properties. *Journal of Vocational Behavior*, 45, 310–327.
- Bundesamt für Berufsbildung und Technologie (2007). *Berufsbildung in der Schweiz 2007—Zahlen und Fakten [Vocational education in Switzerland 2007—facts and figures]*. Bern: Author.
- Dik, B. J., Sargent, A. M., & Steger, M. F. (2008). Career development strivings: Assessing goals and motivation in career decision-making and planning. *Journal of Career Development*, 35, 23–41.
- Eggerth, D. E., & Andrew, M. E. (2006). Modifying the C Index for use with Holland codes of unequal length. *Journal of Career Assessment*, 14, 267–275.
- Emmons, R. A. (1996). Striving and feeling: Personal goals and subjective well-being. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 313–337). New York: Guilford Press.
- Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: Norton.
- Ford, D. H. (1987). *Humans as self-constructing living-systems: A developmental perspective on behavior and personality*. Hillsdale, NJ: Erlbaum.
- Ford, M. E. (1992). *Motivating humans: Goals, emotions, and personal agency beliefs*. Newbury Park, CA: Sage.
- Freund, A. M., & Baltes, P. B. (2002). Life-management strategies of selection, optimization, and compensation: Measurement by self-report and construct validity. *Journal of Personality and Social Psychology*, 82, 642–662.
- Gati, I., & Asher, I. (2001). Prescreening, in-depth exploration, and choice. From decision theory to career counseling practice. *Career Development Quarterly*, 50, 140–157.
- Gottfredson, L. S. (1981). Circumscription and compromise: A developmental theory of occupational aspirations. *Journal of Counseling Psychology*, 28, 545–579.
- Gottfredson, L. S. (2002). Gottfredson's theory of circumscription, compromise, and self-creation. In D. Brown & Associates (Eds.), *Career choice and development* (4th ed., pp. 85–148). San Francisco, CA: Jossey-Bass.
- Haeblerlin, U., Imdorf, C., & Kronig, W. (2004). *Chancenungleichheit bei der Lehrstellensuche: Der Einfluss von Schule, Herkunft und Geschlecht [Unequal chances in the search for an apprenticeship: The influence of school, origin, and gender]*. Bern/Aarau: Schweizerischer Nationalfonds.
- Haeblerlin, U., Imdorf, C., & Kronig, W. (2005). Verzerrte Chancen auf dem Lehrstellenmarkt [Distorted opportunities on the labor market for trainees]. *Zeitschrift für Pädagogik*, 51, 116–134.
- Heckhausen, J., & Tomasik, M. J. (2002). Get an apprenticeship before school is out: How German adolescents adjust vocational aspirations when getting close to a developmental deadline. *Journal of Vocational Behavior*, 60, 199–219.
- Helwig, A. A. (2001). A test of Gottfredson's theory using a 10-year longitudinal study. *Journal of Career Development*, 28, 77–95.
- Henderson, S., Hesketh, B., & Tuffin, K. (1988). A test of Gottfredson's theory of circumscription. *Journal of Vocational Behavior*, 32, 37–48.
- Hesketh, B., Elmslie, S., & Kaldor, W. (1990). Career compromise: An alternative account to Gottfredson's theory. *Journal of Counseling Psychology*, 37, 49–56.
- Hill, N. E., Ramirez, C., & Dumka, L. E. (2003). Early adolescents' career aspirations: A qualitative study of perceived barriers and family support among low-income ethnically diverse adolescents. *Journal of Family Issues*, 24, 934–959.
- Hirschi, A. (submitted for publication). Eine typologische Analyse des Schweizerischen Lehrstellenmarktes: Strukturelle Benachteiligung von jungen Frauen [A typological analysis of the Swiss vocational educational market: Structural disadvantage for female adolescents].
- Hirschi, A. (in press). Swiss adolescents' career aspirations: Influence of context, age, and career adaptability. *Journal of Career Development*.
- Holland, J. L. (1994). *The self directed search*. Odessa, FL: Psychological Assessment Resources.
- Jörin, S., Stoll, F., Bergmann, C., & Eder, D. (2004). *Explorix®—das Werkzeug zur Berufswahl und Laufbahnplanung [Explorix—the tool for career choice and career planning]*. Berne: Hans Huber.
- Judge, T. A., Bono, J. E., Erez, A., & Locke, E. A. (2005). Core self-evaluations and job and life satisfaction: The role of self-concordance and goal attainment. *Journal of Applied Psychology*, 90, 257–268.
- Kuncel, N. R., Crede, M., & Thomas, L. L. (2005). The validity of self-reported grade point averages, class ranks, and test scores: A meta-analysis and review of the literature. *Review of Educational Research*, 75, 63–82.
- Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior*, 45, 79–122.
- Lent, R. W., Brown, S. D., Nota, L., & Soresi, S. (2003a). Testing social cognitive interest and choice hypotheses across Holland types in Italian high school students. *Journal of Vocational Behavior*, 62, 101–118.
- Lent, R. W., Brown, S. D., Schmidt, J., Brenner, B., Lyons, H., & Treistman, D. (2003b). Relation of contextual supports and barriers to choice behavior in engineering majors: Test of alternative social cognitive models. *Journal of Counseling Psychology*, 50, 458–465.
- Lerner, R. M., Freund, A. M., De Stefanis, I., & Habermas, T. (2001). Understanding developmental regulation in adolescence. The use of the selection, optimization, and compensation model. *Human Development*, 44, 29–50.
- Meyer, T. (2004). *Wie weiter nach der Schule? Zwischenergebnisse des Jugendlängsschnitts TREE [How to continue after school? Preliminary analyses of the longitudinal youth study TREE]*. Bern/Aarau: Schweizerischer Nationalfonds.
- Moser, U. (2004). *Jugendliche zwischen Schule und Berufsbildung [Adolescents between school and vocational education]*. Bern/Aarau: Swiss Science Foundation.
- Nurmi, J. E. (2004). Socialization and self-development: Channeling, selection, adjustment, and reflection. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed., pp. 85–124). Hoboken, NJ: John Wiley & Sons.
- Patton, W., & Creed, P. (2007). The relationship between career variables and occupational aspirations and expectations for Australian high school adolescents. *Journal of Career Development*, 34, 127–148.
- Reitzle, M., & Silbereisen, R. K. (2000). The timing of adolescents' school-to-work transition in the course of social change: The example of German unification. *Swiss Journal of Psychology*, 59, 240–255.
- Reitzle, M., Vondracek, F. W., & Silbereisen, R. K. (1998). Timing of school-to-work transitions: A developmental-contextual perspective. *International Journal of Behavioral Development*, 22, 7–28.
- Rojewski, J. W., & Yang, B. (1997). Longitudinal analysis of selected influences on adolescents' occupational aspirations. *Journal of Vocational Behavior*, 51, 375–410.
- Salmela-Aro, K., Aunola, K., & Nurmi, J. (2007). Personal goals during emerging adulthood: A 10-year follow up. *Journal of Adolescent Research*, 22, 690–715.
- Savickas, M. L. (1997). Career adaptability: An integrative construct for life-span, life-space theory. *Career Development Quarterly*, 45, 247–259.
- Schoon, I., & Parsons, S. (2002). Teenage aspirations for future careers and occupational outcomes. *Journal of Vocational Behavior*, 60, 262–288.
- Silvia, P. J. (2001). Expressed and measured vocational interests: Distinctions and definitions. *Journal of Vocational Behavior*, 59, 382–393.
- Super, D. E. (1990). A life-span, life-space approach to career development. In D. Brown & L. Brooks (Eds.), *Career choice and development: Applying contemporary theories to practice* (2nd ed., pp. 197–262). San Francisco, CA: Jossey-Bass.
- Vondracek, F. W., & Porfeli, E. J. (2008). Social contexts for career guidance throughout the world. Developmental-contextual perspectives on career across the lifespan. In J. A. Athanassou & R. V. Esbroeck (Eds.), *International handbook of career guidance* (pp. 209–225). Springer.
- Vondracek, F. W., Lerner, R. M., & Schulenberg, J. E. (1983). On aspiring to present a developmental theory of occupational aspirations: A reader's guide to Gottfredson. *Journal of Vocational Behavior*, 23, 213–218.
- Vondracek, F. W., & Reitzle, M. (1998). The viability of career maturity theory: A developmental-contextual perspective. *Career Development Quarterly*, 4, 6–15.
- Vondracek, F. W., Silbereisen, R. K., Reitzle, M., & Wiesner, M. (1999). Vocational preferences of early adolescents: Their development in social context. *Journal of Adolescent Research*, 14, 267–288.
- Walls, R. T. (2000). Vocational cognition: Accuracy of 3rd-, 6th-, 9th-, and 12th-grade students. *Journal of Vocational Behavior*, 56, 137–144.