

Vocational Identity Trajectories: Differences in Personality and Development of Well-being

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Abstract: This person-centred study investigated the longitudinal patterns of vocational identity development in relation to personality, the development of well-being, gender, nationality and the attended school track among two cohorts of Swiss adolescents in 8th or 9th grade ($N = 269$) and in 11th or 12th grade ($N = 230$). The results confirmed the existence of four identity statuses, namely, achievement, foreclosure, moratorium and diffusion. Forty-two per cent of students showed progressive patterns of identity development, while 37% remained in their identity status over time. Students with different statuses and status change patterns differed significantly in their personality traits. Higher neuroticism related to the emergence of identity exploration over time, while conscientiousness related to maintaining or achieving a sense of identity commitment in terms of achievement or foreclosure. Controlling for the effects of socio-demographics and personality traits, students who reached or maintained a state characterized by identity clarity and commitment showed a relative increase in life satisfaction, while those entering a state of identity crisis or exploration showed a decrease in life satisfaction. Copyright © 2011 John Wiley & Sons, Ltd.

Key words: vocational identity; career development; adolescence; personality; well-being

INTRODUCTION

The development of an occupational or vocational identity is one core aspect of adolescent identity development (Erikson, 1968). Different researchers have concluded that vocational identity is a central component of agentic control over one's career development; as such, vocational identity provides a framework for goal setting and self-direction, facilitates the transition from school to work and contributes to one's adjustment and well-being (Meeus, Deković, & Iedema, 1997; Meijers, 1998; Mortimer, Zimmer-Gembeck, Holmes, & Shanahan, 2002). According to Gottfredson (2002), children develop their career aspirations through processes of circumscription and compromise according to power, gender and social evaluation starting at age three. In adolescence, they start aligning their aspirations to their internal, unique self and thus start to form a self-reflective vocational identity. As such, it has been contended that actively engaging in the construction of a vocational identity and reaching at least a tentatively achieved vocational identity during adolescence is an important developmental task that promotes adjustment and positive development (Skorikov & Vondracek, 2007). In this context, the present study investigated the development of a vocational identity in adolescence in relation to personality traits, socio-demographic variables and the development of well-being.

One framework that has been frequently adapted to study vocational identity development is Marcia's (1980) elaboration of Erikson's (1963, 1968) theory of ego development. Marcia distinguishes four identity statuses according to the degree of exploration and decision-making crisis on the one hand and the commitment to a particular identity on the other hand. These two dimensions are proposed to be independent, which results in four possible identity statuses. *Identity achievement* (A) is reached after a thorough exploration of possibilities and a successful resolution of an identity crisis, resulting in a commitment to a self-chosen goal. This status is therefore represented by high commitment and high exploration. *Identity foreclosure* (F) describes a state in which the commitment to an identity is typically reached by a premature identification with a role model without prior exploration and crisis (high commitment, low exploration). *Identity moratorium* (M) refers to an active, ongoing process of exploration and crisis and an unreadiness to commit to a certain identity, represented by high exploration but low commitment. Finally, *identity diffusion* (D) refers to a lack of engagement in and concern about the identity construction process, represented by low exploration and low commitment.

Regarding the development of identity statuses, Waterman (1999) proposed that there are six possible progressive developments between the different identity statuses, namely, $D \rightarrow F$, $D \rightarrow M$, $D \rightarrow A$ (through M), $F \rightarrow M$, $F \rightarrow A$ (through M) and $M \rightarrow A$, and six possible developmental shifts that are not progressive or are even regressive, that is, $F \rightarrow D$, $M \rightarrow D$, $A \rightarrow D$ (representing the regressive shifts) and $M \rightarrow F$, $A \rightarrow F$ and $A \rightarrow M$ (representing anomalous or non-progressive shifts). His

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developmental hypothesis states that identity has a developmental direction away from diffusion toward achievement through the intermediate steps of foreclosure or moratorium. Qualitative (Berzonsky, 1996; Meeus, 1996; van Hoof, 1999), and quantitative (Kroger, Martinussen, & Marcia, 2010) reviews of cross-sectional and longitudinal research support this general developmental hypothesis by showing that identity achievers are more prevalent in older groups, while diffusion is more common in younger age groups. Moreover, the reviews showed that progressive shifts are more prevalent than regressive shifts between identity statuses. However, empirical research provides only partial support for a clear developmental pattern as suggested by Waterman (1982); research supports an individual difference hypothesis (Marcia, 1966) of identity statuses, which states that the statuses represent relatively stable individual dispositions. In fact, Kroger et al. (2010) reported that among the 124 studies analysed in their meta-analysis, 49% of all subjects remained stable in their identity status over time. Meeus, van de Schoot, Keijsers, Schwartz, and Branje (2010) report that as high as 63% of their study participants in early-to-middle and middle-to-late adolescence remained in the same identity status over time.

Very similar results are reported by studies investigating vocational identity development in adolescence. Many adolescents show a relatively stable vocational identity over shorter periods of time, and there are no clear developmental patterns between identity statuses (Meeus & Deković, 1995; Meeus, Iedema, Helsen, & Vollebergh, 1999; van Hoof, 1999). However, over the course of adolescence, there is a developmental progression from diffusion into achievement (Fadjukoff, Pulkkinen, & Kokko, 2005; Pulkkinen & Kokko, 2000; Skorikov & Vondracek, 1998).

Identity and personality traits

Given the observed relative stability of identity statuses over time, one area of interest in the existing literature has been the investigation of the relationship between identity and personality traits to understand to what extent identity is also dependent on a more basic and presumably stable disposition (Meeus et al., 1999). Research and meta-analyses on personality development in adolescence showed that traits are relatively stable starting from early adolescence and that the major changes in personality occur in early adulthood (Caspi, Roberts, & Shiner, 2005; Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009; Roberts & DelVecchio, 2000; Roberts, Walton, & Viechtbauer, 2006).

Empirical research on the relationship between identity statuses and personality (Clancy & Dollinger, 1993; Crocetti, Rubini, Luyckx, & Meeus, 2008; Luyckx, Goossens, Soenens, Beyers, & Vansteenkiste, 2005; Luyckx, Soenens, & Goossens, 2006; Marcia, 1993) showed that identity achievement was related to high extraversion, emotional stability, conscientiousness, openness and agreeableness. Moratorium was related to high openness but lower extraversion, emotional stability and conscientiousness. Foreclosure was related to less openness, extraversion, agreeableness and conscientiousness compared to achieve-

ment but was also related to comparatively high emotional stability. Finally, diffusion was related to low emotional stability, conscientiousness, agreeableness and moderate openness. Regarding the two identity dimensions, emotional stability and conscientiousness were primarily positively related to the commitment dimension of identity development, while openness was positively related to the exploration dimension.

Empirical studies investigating vocational identity again showed very similar results. Higher vocational identity achievement, specifically with respect to commitment and career decidedness, was related to different personality characteristics, such as a higher internal locus of control and belief in self-efficacy and greater levels of conscientiousness, extraversion and emotional stability (Betz, Klein, & Taylor, 1996; Bloor & Brook, 1993; Gushue, Scanlan, Pantzer, & Clarke, 2006; Holland, Johnston, & Asama, 1993; Robitschek & Cook, 1999). However, a less-developed vocational identity, specifically in terms of lower levels of identity commitment and decidedness, was related to personality traits such as increased indecisiveness, dysfunctional thinking, trait anxiety or depression (Saunders, Peterson, Sampson, & Reardon, 2000; Strauser, Lustig, Cogdal, & Uruk, 2006; Sweeney & Schill, 1998).

Identity and well-being

Another line of identity research focuses on its relation to well-being, based on Erikson's (1968) and Marcia's (1989) proposed connection of the two constructs. Different studies across identity domains have concluded that achievement is the healthiest status and the commitment dimension in particular is related to well-being (Crocetti et al., 2008; Holland et al., 1993; Luyckx et al., 2005; Meeus et al., 1999). Consequently, achievement and foreclosure or high identity clarity and commitment, have been linked to higher levels and an increase in well-being, moratorium or search for identity and identity exploration, has been linked to lower levels, and diffusion has been related to moderate levels.

However, only sparse knowledge is available how personality relates to the intersection of identity and well-being. It is well established that basic personality dispositions, particularly emotional stability and extraversion, are strongly related to the experience of well-being (Steel, Schmidt, & Shultz, 2008). Hence, it might be that the reason different identity statuses are related to different degrees of well-being could be explained by their relation to more basic personality traits. To the best of my knowledge, no study has investigated the incremental validity of vocational identity development in relation to the development of well-being above and beyond their common relation to personality in adolescence.

Another limitation of the current literature is that sparse attention has been paid to the social and environmental context of identity development (Schwartz, 2005). Given the contextual nature of career and identity development (Phinney & Goossens, 1996; Vondracek, 1992; Vondracek, Lerner, & Schulenberg, 1986) more attention should be given to factors such as gender, nationality/ethnicity or educational

and work environments in relation to vocational identity development.

Present study and hypotheses

The aim of the study was to assess the development of vocational identity among Swiss students in middle and late adolescence in relation to basic personality dispositions and to the development of well-being. Also, vocational identity development in relation to socio-demographic factors in terms of gender, nationality and the type of school attended was of interest.

Based on previous research cited above, it was expected that conscientiousness and emotional stability would be positively related to advancement in vocational identity development, primarily regarding the commitment dimension. On the other hand, openness was expected to be primarily related to advancement along the exploration dimension. It was further expected that students in identity achievement and foreclosure would show the highest levels of life satisfaction as a key cognitive component of general well-being (Diener, Suh, Lucas, & Smith, 1999). Students in moratorium were expected to show the lowest levels of life satisfaction, and those in diffusion were expected to show intermediate levels. Consequently, it was expected that progress towards identity statuses with high commitment (i.e. foreclosure and achievement) would be positively related to an increase in well-being over time. It was finally assumed that those relationships are true even when controlling for the common relation of identity development and well-being to basic personality traits.

In addition to the relation of vocational identity statuses to personality and well-being, the study took into account the contextual nature of identity development. It was conducted in Switzerland, where a strong emphasis is given to vocational education and training (VET) in adolescence as the primary route to train and educate the future workforce. About 70% of all students continue to vocational education and training after finishing compulsory school. The remainder of students continue to general high school or specialized middle schools, where the primary focus is preparing students for later college education (Federal Office for Professional Education and Technology, 2007). The study investigated vocational identity statuses among two cohorts of adolescents: (1) 8th through 9th graders in their last year of compulsory schooling and prior to making the transition to VET or high school. These students were divided into classes with advanced academic requirements and those with basic academic requirements; and (2) 11th through 12th grade, prior to making the transition from post-secondary education to the regular labour market or higher education. Those students attended classes at VETs or college-preparation high schools.

Previous research has shown that Belgian adolescents in the workforce or vocational tracks reported more identity commitment but less exploratitracks (Beyers and Goossens, 2008; Luyckx, Schwartz, Goossens, & Pollock, 2008) and it was thus expected that students in VET would progress more towards identity statuses described by strong commitment

(achievement/foreclosure) compared to college-preparation students, who were expected to move more towards moratorium. Other studies have shown that among Swiss students in middle adolescence, no differences between students in high versus basic academic achievement tracks existed regarding their vocational identity commitment (Hirschi & Läge, 2007) but that students in basic tracks showed more exploration than those in tracks with higher academic demands (Hirschi, in press). Previous studies have found gender differences in identity exploration, with female adolescents showing more exploration but no gender differences in commitment (Luyckx, Schwartz, Berzonsky, et al., 2008; Luyckx, Schwartz, Goossens, et al., 2008). It was thus expected that students from basic school tracks as well as girls would show stronger increases in exploration over time and would more likely move into a moratorium status compared to boys and students from advanced school tracks. Finally, research regarding ethnicity differences for identity statuses is sparse. However, there are some studies indicating that students from ethnic minorities score lower in identity commitment and are more frequently in identity moratorium (Crocetti et al., 2008; Hirschi, in press) and less in foreclosure, diffusion (Crocetti et al., 2008) and achievement (Hirschi, in press) than are adolescents from the ethnic majority. The same patterns were expected for the present study.

METHOD

Participants

Two cohorts of students from a German-speaking part of Switzerland participated in the study. Cohort 1 consisted of 269 students, who were assessed at the end of the 8th grade (T1) and again at the end of the 9th grade (T2). Half (49.1%) were girls, and the age of the cohort ranged from 13 to 17 years ($M = 15.1$, $SD = 0.7$) at the first time of measurement. Eighty per cent were Swiss nationals; the other students had other nationalities, mostly from south-eastern Europe. Sixty per cent attended a school track with advanced requirements; the other attended a track with basic requirements. This separation is mainly based on scholastic achievement in primary school and has important consequences for career development, as students from advanced tracks have more available vocational and educational options.

Cohort 2 consisted of 230 students assessed at the end of the 11th grade (T1) and at the end of the 12th grade (T2). The majority (71%) were girls. Their age ranged from 16 to 20 years ($M = 17.5$, $SD = 0.9$) at the first time of measurement. Of this group, 188 (81.3%) were Swiss nationals; the other students had nationalities mostly from western Europe and south-eastern Europe. Of this cohort, 150 students (65.2%) attended vocational education and training as office clerks (34.9%), retail salespersons (22.3%) or assistant nurses (7.9%); the other 34.8% attended general high school, which prepared for later college education. Race was not assessed between the two cohorts, but almost all students in the region were white.

Measures

Demographic questionnaire

Students were asked to indicate their gender, nationality, age in years and attended school track. Nationality was coded as Swiss or other nationality.

Career exploration

As is the case in the Career Exploration Scale by Stumpf, Colarelli, and Hartman (1983) and other career exploration scales used in adolescent career development research (Kracke & Schmitt-Rodermund, 2001), the degree of conducted career exploration was assessed in terms of self- and environmental exploration. Four items tapped self-exploration (e.g. 'thinking about personal strengths and skills'), and six items measured environmental exploration (e.g. 'acquire information about career fields of interest'). Answers were provided on a five-point Likert scale indicating to what degree one has engaged in these behaviours during the last 3 months, with answers ranging from *seldom/few* to *very much/a lot*. Higher scores indicate more engagement in career exploration during the last months. Support for the construct validity of the scale was provided with significant relations to established measures of career exploration and career planning (Hirschi, 2010). Further support for the scale's convergent and divergent validity is presented in Table 1. The Cronbach's α values within the present sample were .90 and .89 for Group 1 and .88 and .81 for Group 2 at the two measurement points, respectively.

Commitment

In Cohort 1, commitment was measured with the career decidedness/commitment scale of the German language adaptation of the *Career Maturity Inventory* (Crites, 1973; Seifert & Stangl, 1986). The scale consists of 12 items (e.g. 'I don't know exactly what to do in order to choose the right occupation') and answers are indicated on a four-point scale ranging from *not agree* to *completely agree*. The scales are well established in the international literature, and support for the validity of the German-language version is provided by several studies showing, for example, positive relations of the scale to career planning and actively applying for

an apprenticeship after school (e.g. Bergmann, 1993). Cronbach's α were .85 and .89 at the two measurement points, respectively. In Cohort 2, commitment was assessed with the German-language adaptation of the *Vocational Identity Scale* (Holland, Daiger, & Power, 1980; Jörin, Stoll, Bergmann, & Eder, 2004). The scale consists of 10 items, and students can indicate how much the statements (e.g. 'I'm not sure yet which occupations I could perform successfully') resemble their personal situation ranking from 'not at all' to 'completely'. Answers were provided on a five-point Likert scale, and higher scores indicate more commitment to one's vocational identity. The measure is well established in the international literature (Holland et al., 1993), and studies with the German language version have been able to show that the scale shows positive correlations to career decidedness, career planning and career exploration among adolescents (Hirschi & Läge, 2007). Cronbach's α in the present sample was .78 and .88 at the two measurement points, respectively. Two different commitment scales were applied because the scales were designed for different age groups by the scale developers and possess different face validity for the groups due to item wording. However, previous studies applying both scales within the same group of students showed correlations of $r > .8$, indicating that the two scales basically measure the same construct (Hirschi & Läge, 2007). Both scales were standardized for each participant by dividing the participant's scale sum-score by the number of items. The five-point scale of Cohort 1 was then linearly transformed into a four-point scale to make it directly comparable to the results from Cohort 2.

Personality traits

Neuroticism, extraversion, agreeableness, openness and conscientiousness were assessed with the official German-language adaptation of the *NEO-FFI* (Borkenau & Ostendorf, 1993; Costa & McCrae, 1992). Students had to indicate how much they agree with different statements (e.g. 'I am not easily worried'), which tap each of the five constructs in alternative order, ranging from *strongly disagree* to *strongly agree*. Based on scale evaluation studies with adolescents (Lüdtke, Trautwein, Nagy, & Köller, 2004; Rost, Carstensen, & von Davier, 1999; Roth, 2002) a four-point Likert scale instead of the original five-point scale was applied. Higher points indicate a higher value in the assessed construct. The authors of the scale provide compelling support for its factor structure, reliability and construct validity (Borkenau & Ostendorf, 1993). Cronbach's α was .77 for neuroticism, .73 for extraversion, .60 for openness, .69 for agreeableness and .78 for conscientiousness for Cohort 1 and .83, .75, .69, .68 and .77 for Cohort 2, respectively.

Well-being

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 is one of the most frequently applied measures as an indicator of well-being and has been found to possess excellent reliability and validity as well as applicability to

Table 1. Correlations of identity measures with personality and well-being scales ($N = 499$)

	Exploration		Commitment	
	T1	T2	T1	T2
Neuroticism	-.025	.176***	-.191***	-.197***
Extraversion	.025	-.075	.118*	.076
Openness	.137*	-.021	-.027	-.005
Agreeableness	-.012	-.094*	.090*	.064
Conscientiousness	.145***	-.015	.262***	.147***
Well-being				
T1	.078	.081	.295***	.009
T2	.177***	-.057	.239***	.443***

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

research with adolescents (e.g. Lucas, Diener, & Suh, 1996; Neto & Barros, 2007). The German language version showed properties similar to the original version among a group of Swiss adults (Peterson, Ruch, Beermann, Park, & Seligman, 2007). Cronbach's α in the present study was .82 and .85 for Cohort 1 and .80 and .87 for Cohort 2 at the two measurement points, respectively.

Procedure

A random five of 10 secondary schools and the only two vocational high schools and the only one general high school in the study region were selected to participate in the research project. Teachers and directors of the selected schools were contacted and asked whether they would participate with their classes in a study on career choice and development and all agreed to do so. Students and their parents/guardians of Cohort 1 were then informed about the general nature of the study some weeks prior to data collection. For both cohorts, participation was voluntary and with active consent. All students attending class on the day of data collection completed the questionnaires. All measures were completed in their classes under the supervision of their teachers during an ordinary school lesson. At the first measurement point (T1), all students completed the demographic survey as well as the measures for career exploration, commitment, personality and well-being. At the second measurement point (T2), approximately 1 year later, the participants again completed the measures for exploration, commitment and well-being.

RESULTS

Attrition analysis

At the second measurement point, some classes were no longer available for data collection, resulting in missing cases at T2 (Cohort 1, $n = 59$, 22%; Cohort 2 $n = 42$, 18.3%). In Cohort 1, the missing students did not differ in gender, attended school type, nationality or any of the assessed variables at T1. Among Cohort 2, students from college preparation classes were over-represented among the missing cases, $\chi^2(1, N = 230) = 43.4, p < .001, \phi = .445$ and missing students scored higher in openness ($d = .53$) and higher in exploration ($d = .61$) at T1. No differences occurred in the distribution of gender, nationality or other assessed variables. The results indicate that data for Cohort 1 are probably missing at random. For Cohort 2, some relation of the missing values to missingness might have occurred, as missing values in exploration and commitment at T2 might be related to the unobserved value of those variables. However, missing data are mainly based in absenteeism of school classes and not individual attrition. Therefore, it was determined that the data could reasonably reliably be estimated with a fully efficient estimation procedure and missing data in both cohorts were estimated based on the maximum-likelihood method with SPSS 16.

Relations among the measures and group differences

Bivariate correlations showed that commitment at T1 was correlated with commitment at T2 ($r = .344, p < .001$) and with exploration at T1 ($r = .314, p < .001$) and negatively correlated with exploration at T2 ($r = -.092, p < .05$). Commitment at T2 related positively to exploration at T1 ($r = .257, p < .001$) but negatively to exploration at T2 ($r = -.151, p < .01$). Exploration at T1 was unrelated to exploration at T2 ($r = -.063, p = .159$).

Regarding relationships to the assessed personality measures, Table 1 shows that commitment at both measurement points related negatively to neuroticism and positively to conscientiousness and well-being. Commitment at T2 was unrelated to well-being at T1. Commitment at T1 also related positively to extraversion at T1. Exploration at T1 was positively related to openness, conscientiousness and well-being at T2. Exploration at T2 related negatively to agreeableness but positively to neuroticism.

Potential group differences in the exploration and commitment measures were assessed with repeated ANOVA measures. The results showed a significant main effect of time for exploration, $F(1,497) = 7.20, p = .008, \eta^2 = .014$, but not for commitment $F(1,497) = 2.28, p = .132, \eta^2 = .005$, indicating an on average significant intra-individual increase in exploration but not commitment over time. The interaction effects of time and the socio-demographic measures showed that girls reported higher increase of exploration compared to boys, with $F(1,497) = 13.1, p < .001$ and $\eta^2 = .026$, whereas no gender differences related to commitment emerged. Swiss students and students of other nationalities did not differ in terms of changes in exploration or commitment over time. Students from the older cohort showed higher increase of exploration, with $F(1,497) = 199.1, p < .001$ and $\eta^2 = .286$, but lower increase of commitment, with $F(1,497) = 34.3, p < .001$ and $\eta^2 = .065$, compared to the younger cohort. In order to examine differences between school-tracks, I analysed each cohort separately because their respective school-types were not comparable. Within the older cohort, students attending VET showed a greater increase in commitment compared to those in college preparatory high school, with $F(1,228) = 8.3, p = .004$ and $\eta^2 = .035$, but no difference in exploration. Within the younger cohort, no differences in exploration or commitment occurred between the two school tracks (advanced vs. basic requirements).

Statistical approach for investigating the study's aims

In accordance with previous research on identity status development (Luyckx, Schwartz, Goossens et al., 2008; Meeus et al. 1999, 2010), this study applied a person-centred approach that identified students with different identity statuses and different developmental patterns across identity statuses and described how those groups differ in terms of the assessed criterion variables. A person-centred approach for longitudinal data analysis has the advantage of describing intra-individual change, which provides a different perspective that can differ remarkably from findings based on

dominant variable-centred approaches that describe inter-individual change (Molenaar, 2004).

A data-derived approach with cluster analysis to classify students into different identity status groups was applied based on two continuous measures for career exploration and commitment (Schwartz & Dunham, 2000). To classify students into different identity statuses across time and cohorts, I applied I-States as Objects Analysis (ISOA). As explained by Bergman and El-Khoury (1999), this approach includes first identifying common I-States (that is, typical states) with cluster analysis of sub-individuals. Specifically, clusters were formed based on the standardized values for exploration and commitment across T1 and T2, including all students from cohorts 1 and 2. This results in a cluster solution that takes both measurement points into account. Next, each student at each point of measurement is assigned to a specific cluster, which is calculated based on the overall mean values of commitment and exploration across time and cohort. In this way, the assignment of students to different clusters becomes directly comparable across time and cohort. I applied cluster analysis through a two-step procedure as suggested by Gore (2000). First, hierarchical cluster analysis using Ward's method on squared Euclidian distances was applied, and the appropriate number of clusters was determined based on criteria involving the theoretical meaningfulness of each cluster, parsimony and explanatory power. In the second step, the initial cluster centres were used as non-random starting points in an iterative k-means clustering procedure. In a next step, this information is used for describing typical developmental patterns by examining changes in cluster assignment from T1 to T2. Differences between students with different developmental patterns in relation to the socio-demographic, personality trait and well-being variables were then estimated with multinomial

logistic regression analysis, which is an extension of binary logistic regression that uses one dependent variable with several dichotomous categories (i.e. identity status change patterns).

Vocational identity statuses and change patterns

The above-described cluster analysis procedure produced four identity status groups, as represented in Figure 1. These groups correspond directly to Marcia's (1980) proposed states of achievement (high exploration, high commitment), foreclosure (low exploration, high commitment), moratorium (high exploration, low commitment) and diffusion (low exploration, low commitment). This solution was deemed more theoretically meaningful than a three-cluster solution in which the clusters of diffusion and moratorium would have been combined into one larger cluster. Moreover, the three cluster groups explained only 41% variance in exploration (59% in commitment) while the four cluster solution was able to predict 56% variance of exploration and 67% in commitment. The four-cluster solution was also deemed more parsimonious than a five cluster solution in which the diffusion cluster would have been split up into two groups of diffusion, both characterized by below-average exploration and commitment.

Based on those four clusters, 16 identity status change patterns from T1 to T2 are possible; as such, each student was assigned to one pattern based on her or his respective cluster at T1 and T2. Table 2 presents the respective frequency of students in each cluster at the two measurement points and the 16 change patterns. As the results show, stability in the diffusion status was the most frequent pattern, shown by 20.2% of the sample, followed by stable achievement (12.8%), diffusion to achievement (12.2%)

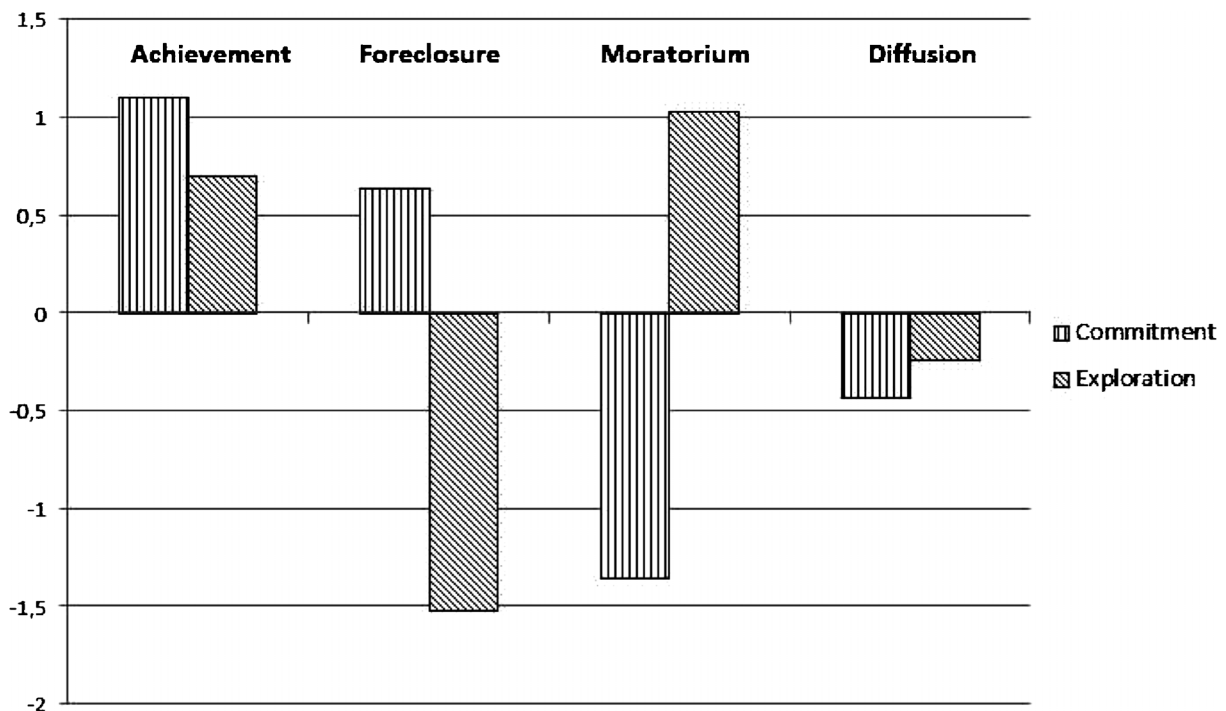


Figure 1. Z-scores for exploration and commitment for the derived identity status groups.

Table 2. Number of students in the four identity status groups and 16 change patterns

	T1 <i>n</i> (%)	T2 <i>n</i> (%)	Change pattern	<i>n</i> (%)
Diffusion	249 (49.9)	164 (32.9)	D → D	101 (20.2)
			D → A	61 (12.2)
			D → M	51 (10.2)
			D → F	36 (7.2)
Achievement	135 (27.1)	163 (32.7)	A → D	28 (5.6)
			A → A	64 (12.8)
			A → M	8 (1.6)
			A → F	35 (7.0)
Moratorium	40 (8)	90 (18)	M → D	16 (3.2)
			M → A	12 (2.4)
			M → M	9 (1.8)
			M → F	3 (0.6)
Foreclosure	75 (15)	82 (16.4)	F → D	19 (3.8)
			F → A	26 (5.2)
			F → M	22 (4.4)
			F → F	8 (1.6)

and diffusion to moratorium (10.2%). Only very few students showed stable foreclosure (1.6%), stable moratorium (1.8%) or achievement to moratorium (1.6%). Taken together and applying Waterman's (1999) classification, 36.5% of participants remained stable in their identity status over time, 41.7% showed identity progression and the remaining 21.8% showed other change patterns, including 12.6% showing regressive changes.

Predicting change in statuses over time

To assess the hypothesis that the socio-demographic variables of cohort, gender, attended school type and nationality and the personality traits of neuroticism, extraversion, openness, agreeableness and conscientiousness would predict different patterns of identity status changes over time, multinomial logistic regression with the 16 aforementioned identity change patterns as dependent variables was applied. The four socio-demographic measures and the five personality traits were included as independent variables. The change pattern of diffusion–diffusion, representing continuous disengagement in identity construction, was used as the reference category, meaning that the effects of the independent variables on the difference between the dependent variables and the reference category were assessed. The results of the regression analysis revealed that the independent variables significantly predicted differences in change patterns, with Nagelkerke Pseudo- $R^2 = .59$, $\chi^2 (N = 499, 150) = 436.4$ and $p < .001$. The results further showed that the cohort, with $\chi^2 (N = 499, 15) = 49.5$, $p < .001$ and $\phi = .31$, attended school type of the older cohort, $\chi^2 (N = 499, 15) = 49.7$, $p < .001$ and $\phi = .32$, neuroticism, with $\chi^2 (N = 499, 15) = 30.9$, $p = .009$ and $\phi = .25$ and conscientiousness, with $\chi^2 (N = 499, 15) = 49.0$, $p < .001$ and $\phi = .31$, significantly predicted differences in change patterns.

Looking at differences between single change patterns, the results showed that in comparison to students in the D → D pattern, those showing a D → M pattern were more

likely to be in the older cohort, $B = 3.81$, $SD(B) = 1.10$, $p < .001$, while those with an A → M pattern were more likely in the younger cohort, $B = -17.17$, $SD(B) = 0.97$, $p < .001$. Those with a F → M pattern were more often in vocational education compared to college preparatory high school among cohort 2, $B = 3.48$, $SD(B) = 1.14$, $p < .001$. Looking at differences in the standardized (z -transformed) personality measures, in comparison to D → D students, students showing D → M also showed higher levels of neuroticism, $B = 0.51$, $SD(B) = 0.22$, $p = .021$, while those with A → F, $B = -0.74$, $SD(B) = 0.29$, $p = .011$ and F → F, $B = -0.96$, $SD(B) = 0.45$, $p = .031$, showed lower levels of this trait. Higher conscientiousness was predictive of students with D → F, $B = 0.88$, $SD(B) = 0.24$, $p < .001$, A → A, $B = 1.00$, $SD(B) = 0.21$, $p < .001$, A → M, $B = 0.88$, $SD(B) = 0.43$, $p = .042$, A → F, $B = 0.63$, $SD(B) = 0.25$, $p = .011$ and F → A, $B = 0.55$, $SD(B) = 0.25$, $p = .030$, compared to those in continuous diffusion. Hence, the results regarding the relationship of personality and vocational identity status change suggest that neuroticism related positively to the emergence of exploring one's identity, while higher conscientiousness described students who showed and/or developed identity achievement and/or commitment.

Identity status development and change in well-being

Two analyses of covariance (ANCOVA) with life satisfaction measures as the dependent variables and socio-demographic and personality trait variables as covariates were calculated for each time point to assess whether students in different identity clusters showed different levels of well-being within time. The results showed that at both T1, with $F(3,487) = 2.80$, $p = .040$ and $\eta^2 = .017$ and T2, with $F(3,487) = 20.45$, $p < .001$ and $\eta^2 = .112$, there were significant differences. Corresponding to the hypotheses, at both measurement points, students with achievement and foreclosure statuses had the highest scores, while those showing a moratorium status had the lowest scores.

To assess the hypothesis that change in vocational identity status is related to change in well-being over time, multiple hierarchical regression analysis was applied. The measure for life satisfaction at T2 was the dependent variable. In the first step, the life satisfaction measure at T1 was entered into the model to assess the auto-regressive effects and inter-individual stability of well-being over time. In the next step, the socio-demographic variables of cohort, gender, attended school type and nationality were included. In the third step, the five trait measures were included. Finally, identity change patterns were included in the model in the final step. To enter the categorical variable for change patterns with the 16 above-described categories, each pattern was assigned a value of 0 or 1 to represent the membership of a student in this specific category (that is, no or yes, respectively). To prevent singularity, the pattern D → D was excluded because its membership could be derived from memberships in the other 15 patterns. By entering the change patterns in the last step, the model assessed to what extent change patterns predict inter-individual change in well-being

above and beyond the effects of socio-demographics and personality traits.

The results showed that 8.1% of variance in well-being could be attributed to the inter-individual stability of a given measure over time, with $F(1,497) = 43.89$, and $p < .001$. The socio-demographic variables only explained a non-significant 1.1% of additional variance, with $F(5,492) = 1.19$, and $p = .315$. The personality traits explained a significant 5.7% additional variance, with $F(5,487) = 6.55$, and $p < .001$. Finally, the identity status change patterns explained a significant 13.1% of additional variance in change in well-being above and beyond the already included measures, with $F(1,472) = 5.74$, and $p < .001$. Overall, the model could explain 28% of variance in well-being, with $F(26,472) = 7.08$, and $p < .001$. Less neuroticism ($\beta = -.177$, $p < .001$) and more conscientiousness ($\beta = .124$, $p = .006$) were significant personality predictors of inter-individual increase in well-being over time. $D \rightarrow M$ ($\beta = -.127$, $p = .012$) and $F \rightarrow M$ ($\beta = -.113$, $p = .016$) predicted a decrease in well-being, while $D \rightarrow A$ ($\beta = .149$, $p = .002$), $D \rightarrow F$ ($\beta = .129$, $p = .004$), $A \rightarrow A$ ($\beta = .196$, $p < .001$), $A \rightarrow F$ ($\beta = .191$, $p < .001$), $M \rightarrow A$ ($\beta = .134$, $p = .001$) and $F \rightarrow A$ ($\beta = .137$, $p = .003$) predicted an increase in well-being.

DISCUSSION

The study investigated the intra-individual development of vocational identity between two cohorts of Swiss adolescents, from the 8th through the 9th grade and from the 11th to the 12th grade. It was expected that personality dispositions together with socio-demographic variables would significantly differentiate between students who showed different patterns of identity development. It was further assessed how patterns of identity change would be related to change in well-being over time and whether such relationships could be explained by their shared relation to personality traits.

Vocational identity statuses and trajectories

This study applied a derived data-driven, person-centred approach to data analysis, which classified students into different identity statuses based on cluster analysis along the two dimensions of exploration and commitment. Based on previous longitudinal and cross-sectional research (Berzonsky, 1996; Kroger et al., 2010; Meeus, 1996; van Hoof, 1999), many students were expected to show stability in their identity status over time, with many diverse patterns of identity change but overall a general development trend from diffusion into achievement across and within the assessed cohorts. The results supported the existence of Marcia's (1980) four identity statuses of achievement, foreclosure, moratorium and diffusion in the context of vocational school among Swiss adolescents. However, the differences between the cohorts regarding their identity statuses only partially conformed to existing research (Berzonsky, 1996; Kroger et al., 2010; Meeus, 1996; van Hoof, 1999). Specifically, students in the younger cohort

more often showed a status of achievement at the first measurement point compared to the older group. This contradicts the proposition that older adolescents are more likely to be in a status of identity achievement compared to younger adolescents. However, as suggested by previous research, at the second measurement point, the younger group was indeed more likely to be in a status of diffusion but less likely to be in a state of moratorium compared to the older cohort. This somewhat counterintuitive finding might be explained by the specific educational transitions in the Swiss system and the respective measurement points of the present study. The younger cohort was first assessed at the end of 8th grade, at which point they were supposed to start applying to either vocational education or high school. As such, there was a strong pressure to implement a vocational identity while applying for specific positions, which might have promoted a sense of early identity achievement. In contrast, by the end of 9th grade, those same students had mostly completed their application processes and might have become temporarily disengaged from vocational identity construction, while for the students in the older cohort who faced the end of their education, the beginning of the job search process might trigger a renewed identity crises and engagement in vocational identity construction. In summary, these results support the notion that identity construction in adolescence does not follow a linear pattern but is characterized by different phases of stability, disengagement, tentative achievement and renewed crises. The data also support the notion that engagement in career identity construction is a process that starts in early childhood and continues throughout adolescence (Gottfredson, 2002; Hartung, Porfeli, & Vondracek, 2005).

Longitudinal patterns of identity status change support this assumption. Applying Waterman's (1999) classification of identity status change patterns, the majority of students showed progressive shifts among identity statuses over time, which is in line with previous research (Kroger et al., 2010) and the general developmental hypothesis (Waterman, 1982) that on average, there is a progressive development of identity throughout adolescence from diffusion into achievement. However, the previous finding that identity shows considerable intra-individual stability was also confirmed. Within the present sample, 36.5% of adolescents with stable statuses were somewhat lower in relative number than the percentages reported in other research, which often reached or exceeded 50% of the study sample (Kroger et al., 2010).

The diversity of change patterns confirms previous findings that there is no general hierarchical transition from so-called lower statuses to so-called higher statuses but that development occurs via various pathways (Meeus et al., 1999). However, as also observed by Meeus et al. (1999), a restricted number of patterns can account for most of the changes observed among participants. About one-fifth of the sample showed a continued disengagement in identity construction, which is a surprisingly large number given the environmental pressures to construct and implement one's vocational identity within the present study context. This confirms other findings that even under such circumstances, vocational identity construction might be prolonged well into

adulthood (Fadjuoff et al., 2005). Stable achievement, diffusion to achievement and diffusion to moratorium accounted for another 35% of the observed patterns, indicating that progressive shifts out of diffusion into achievement or simply the maintenance of achievement were common among the students under study.

The results supported the hypothesis that observed differences in developmental patterns could partially be explained by the personality traits of adolescents. Most importantly, neuroticism was related to an emerging or renewed identity crisis at the end of the assessed time period, immediately before the investigated educational transitions. In contrast, conscientiousness was positively related with reaching achievement and increasing commitment over time. These findings are in line with previous studies suggesting that neuroticism is related to continuous exploration in breath, while conscientiousness relates positively to adaptive coping with the developmental task of identity construction during adolescence and emerging adulthood (Clancy & Dollinger, 1993; Crocetti et al., 2008; Luyckx, Soenens, & Goossens, 2006).

The results on group differences with respect to status change patterns did not support the hypothesized differences according to gender, school type or nationality. In fact, no differences in change patterns between girls and boys or between Swiss and students with other nationalities were observed. Some studies have suggested that girls show higher levels of exploration (Luyckx, Schwartz, Berzonsky et al., 2008; Luyckx, Schwartz, Goossens et al., 2008) and that students with an immigration background show a higher tendency toward moratorium and lower tendency toward foreclosure and diffusion (Crocetti et al., 2008). The findings here suggest that the effects of such socio-demographic variables on identity statuses and change patterns might be moderated by the specific educational and societal contexts of adolescents. The contextual effect on identity development is further exemplified by the finding that students in vocational tracks showed more increase in commitment over time compared to student's in college preparatory high school.

Development of identity and well-being

This study also investigated the relationship of paths of vocational identity development and the development of well-being in terms of life satisfaction. Previous research showed consistent cross-sectional (Crocetti et al., 2008) and longitudinal (Meeus et al., 1999) relationships between identity statuses and well-being. The present study investigated whether these relationships would still be found after their common relationship to basic personality dispositions were taken into account. As expected based on previous research (Diener et al., 1999; Steel et al., 2008), personality traits, specifically low levels of neuroticism and conscientiousness, predicted an inter-individual increase in well-being over time. However, the results provided support for the hypothesis that different paths of vocational identity development are related to different degrees of change in well-being over time, even when statistically controlling for

their relationship to traits. Consistent with expectations, students who reached or stayed in a status of identity commitment or achievement showed significantly higher increases in well-being compared with students who moved into a state of moratorium, which was related to a decrease in well-being. The results suggest that it is not a progression in identity construction as such but specifically the achievement of a sense of commitment and identity clarity that relates positively to higher levels of well-being. The findings support previous studies that show that the commitment dimension of identity formation in particular is positively related to well-being (Marcia, 1993), implying that the inability to reach a sense of vocational identity in middle and late adolescence may have profoundly negative effects on life satisfaction.

Limitations and conclusions

Some limitations apply when interpreting the results of the study. First, personality is one major component with which to understand identity development, but environmental factors such as social support are also of theoretical importance and were not included in the study. Such environmental factors could also be an alternative explanation for the relation between well-being and identity development in the way that more environmental support could lead to greater well-being and also to more positive identity development. Second, the comparison between Cohort 1 and Cohort 2 is only cross-sectional. It would be interesting to follow students for more than one year to gauge the stability of identity statuses over a longer period of time and how these patterns are related to personality traits. A third limitation is that all measures were based on self-reports, which induces shared method bias and might affect the observed relations among the constructs. Separating identity, personality and well-being measures in terms of method, source or time may provide less biased estimates of their relationship in future studies (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Additionally, the limited generalizability of the results due to the use of two convenience samples in a specific Swiss context must be taken into account. The study did not collect data on the specific school-class of a participant. Theoretically, students within certain classes may show more similarity than between classes, which would call for multi-level analysis that was not possible to conduct in the present study. Finally, the study did not investigate the possible interaction of personality and vocational identity development and did not distinguish between in-breadth and in-depth exploration and commitment-making from identification with commitment (Luyckx, Goossens, Soenens, & Beyers, 2006). Such extensions and specifications could prove useful in future studies to increase our understanding of the dynamics of vocational identity development in adolescence.

In conclusion, the results provide a picture of the dynamics and complexity of vocational identity development in adolescence. On the one hand, considerable intra-individual stability in identity statuses was observed over time, which could partially be explained by differences in

basic personality dispositions of youth. On the other hand, there was considerable variability in identity development paths which were significantly related to changes in subjective well-being. Here, the results do not confirm the notions that early and middle adolescence is for most youth a time of identity moratorium and that getting engaged in identity construction and reaching a reflected commitment would primarily occur in later adolescence and emerging adulthood (Arnett, 2000; Meeus et al., 1999). Rather, the results imply that, at least in the Swiss context, many students become engaged and subsequently again disengaged in vocational identity construction and that identities are tentatively formed and later questioned in a dynamic process, which starts at least in middle adolescence. Apart from personal dispositions, the specific time points of educational and vocational transitions and the educational environment seem to be major factors with which to understand how and when those processes occur.

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