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## Engagement in adolescent career preparation: Social support, personality and the development of choice decidedness and congruence

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### A B S T R A C T

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Career preparation  
Personality  
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Adolescence  
Career decision-making

This longitudinal panel study investigated predictors and outcomes of active engagement in career preparation among 349 Swiss adolescents from the beginning to the end of eighth grade. Latent variable structural equation modeling was applied. The results showed that engagement in terms of self- and environmental-exploration and active career planning related positively to interindividual increases in career decidedness and choice congruence. More perceived social support, early goal decidedness, and particular personality traits predicted more engagement. Support and personality impacted outcomes only mediated through engagement. Early decidedness and congruence were significant predictors of their respective later levels. Implications for practice are presented.

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Experts agree that career development occurs across the lifespan. Despite this fact, theorists and practitioners tend to focus most on career development processes occurring in later adolescence and early adulthood. This absence of literature on early adolescents is disheartening especially for countries such as Germany, Switzerland, and Austria where most secondary students are required to choose a specific vocational education path in their ninth or tenth grade year—much earlier than their American counterparts (Heinz, 1999).

It is often overlooked that children are engaging in the dynamic process of career exploration, which involves exploring the world of work, examining the self, and understanding how these two are related (Hartung, Porfeli, & Vondracek, 2005). Researchers suggest that children in the age range of 10–12 are able to use their interests, abilities, values and beliefs to guide how and what they learn, as well as the occupational goals they formulate, in relation to the world-of-work (Hartung et al., 2005). Thus it is important to understand these early factors that affect career developmental pathways of early adolescents.

### Positive career development in adolescence

One essential criterion of what constitutes positive adolescent career preparation and development is the ability to crystallize tentative career goals, reach a congruent choice, and at least tentative commitment to a future career (Super, 1990). To cope with these developmental tasks, Super advocated active engagement comprised of planning, exploring, information gathering, and learning decision-making skills. Empirical research suggests that career exploration and planning are positively related to career commitment and decidedness in adolescence (e.g., Creed, Prideaux, & Patton, 2005; Hirschi & Läge, 2007a).

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## Factors contributing to positive adolescent career development

To understand what contributes to positive adolescent career development a look at both intrapersonal and environmental factors is important (Vondracek, Lerner, & Schulenberg, 1986).

### *Intrapersonal – personality variables*

Several studies have established that basic personality dispositions of adolescents are meaningfully related to career development. A consistent finding is that decidedness is related to a number of positive trait and social-cognitive personality dispositions such as emotional stability and internal control beliefs (e.g., Bacanli, 2006; Lounsbury, Hutchens, & Loveland, 2005). Other researchers have found that a positive relationship exists between emotional stability and career planning (Rogers, Creed, & Ian Glendon, 2008) or adaptive personality and career exploration (Kracke, 2002).

### *Environmental – social support*

The family, particularly parents, appears to have a strong impact on occupational development (see Whiston & Keller, 2004, for a review). Palladino Schultheiss, Palma, and Manzi (2005) found that elementary school children are able to describe how important figures in their lives have had a significant influence on their understanding of work. They indicated that their families have shaped their understanding of the functions and meanings of work through the communication of the importance of hard work and earning an income. The type of relationships adolescents have with others also plays a role in career vocational development. In a study conducted on French high school students, those who showed more secure attachment to parents explored educational and vocational environments more (Vignoli, Croity-Belz, Chapeland, de Fillipis, & Garcia, 2005). Similarly, adolescents who report higher levels of attachment to peers are more likely to engage in environmental exploration and to commit to career choices, suggesting that supportive, intimate friendships facilitate the career development tasks of late adolescence (Felsman & Blustein, 1999; Kracke, 2002).

## Present study and hypotheses

The cross-sectional studies prevalent in current research limit the possibility of understanding developmental patterns of important adolescent career outcomes. Also, most studies investigated either intrapersonal or (more seldom) environmental variables but not both of them in a common model. Finally, research investigating not only career commitment but also the degree of congruence of those commitments is lacking despite its theoretical relevance.

The present longitudinal panel study addressed those issues and investigated personal and environmental factors in the development of career choice commitment and congruence among Swiss students in an early phase of the school-to-work transition. In Switzerland, more than two-thirds of all students continue on to vocational education and training (VET) after compulsory school, while a minority of students move to college preparation high school or specialized vocational middle school (Federal Office for Professional Education and Technology, 2007). All students in eighth grade undergo an environmentally imposed career preparation phase in order to successfully manage these transitions after compulsory school. It was thus expected that the investigated period within eighth grade would be an ideal time to establish processes of adolescent career development.

The basic assumption was that more engagement in career preparation would promote the development of career choice decidedness/commitment and congruence over time. It was further assumed that decidedness and congruence would be positively related. Early decidedness and goal clarity but not congruence was expected to have a motivational component resulting in a positive effect of later engagement. That is, students who were already clearer on a career path were expected to show more subsequent engagement in order to elaborate and confirm their decision (Kracke & Schmitt-Rodermund, 2001; Rogers et al., 2008). In addition, it was assumed that personality was related to initial decidedness (Lounsbury et al., 2005) but not congruence (De Fruyt & Mervielde, 1997). We selected neuroticism and locus of control beliefs as two basic personality dispositions, representing both emotional and cognitive components of core self-evaluations (Judge, Erez, Bono, & Thoresen, 2002). As reviewed above, several studies showed the close relation of those personality characteristics to career development and decision-making.

The effects of environmental and personality factors on the development of decidedness and congruence were compared over time in three alternative models, testing fully mediated, non-mediated, and partially mediated effects, respectively. Testing different structural models is important to rule out the possibility that alternative models might fit the data equally well as one specific hypothesized model (Kline, 2005). First, we evaluated a model which states that social support and personality predict engagement but have no direct effects on the outcome measures of decidedness and congruence (fully mediated effects). Second, we evaluated a model in which social support and personality directly predict the outcome measures but have no effect on engagement (non-mediated effects). Third, we tested a model in which direct effects of support and personality are partially mediated by engagement by testing both direct and mediated effects simultaneously. It was expected that the third model would provide the best fit to the data, supporting notions of both direct and mediated effects of environmental and personal variables on positive adolescent career development (Vondracek et al., 1986). Specifically, it was assumed that more social support would lead to more engagement, congruence, and decidedness and more problematic personality characteristics would lead to less engagement, congruence, and decidedness.

In an exploratory fashion, we also investigated possible gender differences across the assessed constructs and relations among them. Existing research indicates that girls generally report more career maturity than boys in terms of occupational knowledge (Creed & Patton, 2003; Creed et al., 2005) while most studies did not find significant differences in terms of career engagement attitudes and behaviors (Creed & Patton, 2003; Creed, Patton, & Prideaux, 2007; Kracke, 2002). However, it might be possible that environmental and personal factors have different effects for boys and girls regarding their career engagement and career choice outcomes.

## Method

### Participants

A total of 349 students in eighth grade from a German speaking part of Switzerland participated in the study. Their age ranged from 12 to 16 years ( $M = 14.09$ ,  $SD = .71$ ) at the point of first measurement. About half were girls (49.6%). Most had a Swiss nationality (81.9%) the others had other nationalities, mainly from South-Eastern Europe (former Yugoslavia and Turkey) and only 2.6% came from non-European countries. Race was not assessed but almost all students in the study region were white.

### Measures

#### Career decidedness

The construct of career decidedness was assessed with two measures: (a) the German language adaptation of the *Career Maturity Inventory* (Crites, 1973; Seifert & Stangl, 1986) *Career Decidedness/Commitment scale*. 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 4-point scale. Within the present study higher scores indicate more career decidedness and commitment. Supporting the construct validity of the scale, studies could show a significant relationship to vocational identity (Hirschi & Läge, 2007a), positive career attitudes, more active application for an apprenticeship after school and more success in actually finding an apprenticeship (e.g., Bergmann, 1993; Seifert, 1993); (b) the *ee* index developed by Hirschi and Läge (2007b) is analogous to other published indexes for career decidedness/commitment (cf. Gati, Kleiman, Saka, & Zakai, 2003). The measure asks students to indicate which of six statements best resembles their current situation ranking from 1 (*I have never really thought about my vocational future*) to 6 (*I already know exactly what I want to do in the future*). Supporting the construct validity of the scale, Hirschi and Läge (2007b) report significant positive relations to vocational identity, career decidedness, career planning and career exploration, as well as a meaningful curve-linear relation to considered career options.

#### Congruence

Career choice congruence was measured as the similarity between a student’s career aspirations and his or her vocational interests. Students were asked to name their current career aspirations which they plan to pursue after finishing grade nine in a free listing form. These aspirations were then transformed into three-letter Holland (1997) RIASEC codes according to the Dictionary of Occupational Codes (Swiss edition) provided by Jörin, Stoll, Bergmann, and Eder (2004). To obtain an inventoried interest code, students were administered the *Revised General Interest Structure Test* (Allgemeiner Interessen Struktur Test – Revidierte Version; Bergmann & Eder, 2005). It consists of 60 items describing an 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 in alternative order were answers are provided on a 5-point Likert scale ranging from *not at all interested* to *very interested* where higher points indicate more interest in this activity. The authors of the inventory provide positive evidence for the inventory’s construct validity (e.g., differences between people employed in different vocations, as well as significant relations to basic personality traits). The authors report reliability estimates (Alpha) ranking from .82 to .87 and 1 month re-test stabilities of .85–.92. Congruence between aspirations and interest inventory profile was then calculated for each named career aspiration by applying two mathematically distinct congruence indices: (a) the *Iachan M-index* (Iachan, 1984) was applied which assigns a value of 0–28 for congruence based on the similarity of the three-letter inventory and the three-letter aspirations code with higher values indicating more similarity and congruence; (b) the *C-index* (Brown & Gore, 1994) which 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 aspirations 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 aspirations were calculated and the mean was taken as the final score of congruence.

#### Career engagement

Measures for the degree of reported exploration and planning activity in the career decision-making process were taken as indicators of career engagement: (a) *career exploration* was assessed in terms of self-exploration and environmental exploration. As is the case in the measure of Stumpf, Colarelli, and Hartman (1983) and other published career exploration measures (Kracke, 2002) two behavioral oriented scales were applied which asked students to indicate on a 5-point Likert scale to what degree they engaged in various behaviors of self-exploration (4 items) and environmental exploration (6 items) during the last three months, with answers ranging from *seldom/few* to *very much/a lot*. Supporting the construct validity, Hirschi (2008) reported

significant relations to another established measure of career exploration, as well as to interest profile elevation, and career commitment. To estimate the total amount of conducted career exploration behaviors throughout the year, the mean values for self- and environment-exploration at both measurement points was taken as the respective exploration score for a student; (b) *career planning* was assessed with the German language adaptation of the Career Development Inventory (Seifert & Eder, 1985; Super, Thompson, Lindeman, Jordaan, & Myers, 1981). The scale consists of 22-items which tap the amount of time and thoughts invested in career planning compared to class-mates, the degree of conducted vocational/educational planning, and the degree of knowledge about one's preferred career options. Answers are indicated on a 5-point Likert scale with higher scores indicating more career planning. Studies supporting the construct validity of the scale showed, for example, positive relations to career knowledge and decidedness, likelihood to obtain an apprenticeship after school, and realizing ones aspired major in university (e.g., Seifert, 1993; Seifert & Eder, 1985). This scale was administered at the beginning and at the end of the school year. To estimate the increase in planning throughout the year while taking into account its absolute level, the degree of career planning was calculated by taking the sum of the standardized values for career planning change over the school-year plus the degree career planning at the end of the school-year (T2) (i.e., Career Planning =  $z\text{PlanningT2} + (z\text{PlanningT2} - z\text{PlanningT1})$ ).

#### *Perceived social support*

The amount of perceived social support was assessed with a modified version of the University of California, Los Angeles, Social Support Inventory (UCLA-SSI; Schwarzer, Dunkel-Schetter, & Kemeny, 1994). The scale assesses the amount of perceived social support from four sources: parents, friends, teachers, and organizations. Students indicate on a 5-point Likert scale how much emotional, informational, and tangible support they received from each source during their career decision-making process, resulting in a 16-item scale with higher points indicating more perceived support. The factorial structure and utility of the original scale for positive coping in various life domains was confirmed by different studies (Simoni, Martone, & Kerwin, 2002; Wrosch & Heckhausen, 1999).

#### *Problematic personality characteristics*

Personality was assessed with two constructs encompassing both cognitive and affective components: (a) perceived externality of control was measured with externality subscale of the Inventory for the Measurement of Self-Efficacy and Externality [FKK] (Krampen, 1991), assessing social externality and fatalistic externality with 16 items (e.g., "I can determine very much of what happens in my life"). Answers are given on a 6-point Likert scale where students indicate how much different statements apply for themselves, ranging from *very wrong* to *very true*. Support for the scale's content and criterion validity is provided for adolescents in terms of significant relations to personality traits, psychological disorders, school motivation, or well-being (Anderson, Hattie, & Hamilton, 2005; Krampen, 1991); (b) *neuroticism* was assessed with the respective scale from the NEO-FFI (Borkenau & Ostendorf, 1993) which is the official German language adaptation of the original scale developed by Costa and McCrae (1992). The trait is assessed with 12 statements (e.g., "I am not easily worried") where each was evaluated within five categories, ranging from *strongly disagree* to *strongly agree*. Higher points on the scale indicate a higher value in the assessed construct. The authors of the scale provide support for its factor structure, reliability and construct validity (i.e., correlations to other established personality inventories; Borkenau & Ostendorf).

Table 1 shows the bivariate correlations, mean and standard values, and Cronbach Alpha estimates for the applied measure scales (because *phase of career decision-making* is an index and not a scale, no alpha for internal consistency could be calculated for this measure).

#### *Procedure*

The teachers in the schools selected to be included in the research were contacted several weeks prior to data collection and asked whether they were willing to participate with their classes in the project. All agreed to do so and students and parents were informed that their children would participate in a study on career development in adolescence. All students from the participating classes completed the questionnaires on all three measurement points during an ordinary school lesson under the supervision of their classroom teacher. The first measurement took place at the beginning of eighth grade and included a brief demographic questionnaire (gender, attended school, and nationality), asked students to name their current career aspirations, presented the interest inventory, the career planning scale, and the two measures for career decidedness. The second measurement point was in the middle of eighth grade, approximately 5 months later and included the scale for exploration. The third measurement point was at the end of eighth grade, approximately 10 months after the first measurement, and asked again to name current career aspirations, presented again the interest inventory, the two measures for career decidedness, career planning, the career exploration scales, and included the scales for externality, neuroticism, and social support.

## **Results**

### *Preliminary analyses and data preparation*

#### *Multivariate normality*

To test for multivariate normality each measured indicator variable was examined for its skewness and kurtosis values. Specifically, self-exploration, support from parents, and phase in career decision making at both measurement points showed

**Table 1**  
Bivariate correlations, means and standard deviations among the measured constructs (N = 349).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Phase <sup>a</sup>	–																
2 Decidedness <sup>a</sup>	.630***	(.87)															
3 Congruence C <sup>a</sup>	.117*	.195***	–														
4 Congruence M <sup>a</sup>	.097	.225***	.819***	–													
5 Self-Exploration	.206***	.200***	.041	.044	–												
6 Environment-Exploration	.221***	.256***	.125*	.106	.668***	–											
7 Planning	.028	.138*	.115	.152*	.334***	.370***	–										
8 Support Parents	.128*	.132*	.028	.024	.193***	.231***	.152*	–									
9 Support Friends	.104	.059	.020	.020	.282***	.286***	.075	.363***	–								
10 Support Teachers	.044	.002	.050	.046	.178**	.226***	.076	.348***	.317***	–							
11 Support Organizations	.004	.028	.066	.052	.172**	.303***	.064	.152**	.247***	.421***	–						
12 Neuroticism	.130*	.188**	.047	.071	.102	.084	.151*	.082	.010	.002	.155*	–					
13 Externality	.019	.099	.006	.066	.068	.140*	.085	.116	.019	.009	.125*	.498***	–				
14 Phase <sup>b</sup>	.346**	.439***	.190***	.219***	.289***	.351***	.310***	.233***	.193***	.089	.056	.014	.032	–			
15 Decidedness <sup>b</sup>	.390***	.486***	.201***	.167**	.250***	.416***	.441***	.230***	.147*	.101	.112	.141*	.112	.665***	–		
16 Congruence C <sup>b</sup>	.161**	.179**	.288***	.345***	.064	.099	.132*	.007	.041	.029	.042	.044	.045	.219***	.208***	–	
17 Congruence M <sup>b</sup>	.102	.200***	.299***	.368***	.106	.173**	.185**	.012	.025	.011	.092	.062	.095	.203***	.262***	.746***	–
M	4.39	35.73	11.39	17.05	14.52	17.51	.01	17.14	13.41	12.43	9.73	25.87	52.27	4.61	38.46	11.56	17.13
SD	1.12	6.36	2.86	6.80	2.63	4.60	1.70	2.79	3.42	3.62	4.05	4.70	1.97	1.12	6.04	2.98	7.70

Note: () Cronbach Alpha \* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

<sup>a</sup> First measurement point.

<sup>b</sup> Second measurement point.

a negative standardized skew between .35 and .85 and were transformed with square root and logarithmic functions (cf. Kline, 2005). After data transformation and removing excessive skewness and kurtosis, the Mardia's (1970) coefficient still indicated a significant deviation from multivariate normality (19.4). Despite this result, we chose to analyze the data with maximum likelihood estimation, since simulation studies showed that parameter estimates remain valid even when the data are non-normal as long as no excessive skewness and/or kurtosis are in the data (McDonald & Ho, 2002).

#### Missing data

At the second measurement point 21 (6%), at the third 29 (8.3%) of the participants did not complete the measures due to absence at the time of data collection. No student missed both follow-up measures. In addition, some single measures were missing for some students due to incomplete or incorrect completion of the measures. To test the pattern of missing data, missing variables were dummy-coded and correlations to all other measured variables were calculated. Applying a Bonferroni adjustment for Type I error, no significant relations emerged between missing variables and other measured variables, indicating that the data were missing at random. Missing scores were replaced with the expectation maximization method prior to model estimation.

#### Item parceling

Item parceling was used to construct indicators for latent variables based on previous exploratory factor analysis to identify the underlying factors of the measures (Little, Cunningham, Shahar, & Widaman, 2002). As recommended (Little, Lindenberger, & Nesselrode, 1999), three indicators for each latent variable were used for each latent construct except for congruence which was represented by the two congruence indexes, imposing equality constraints on the respective loadings (Little et al., 1999). The other indicators were constructed using item parceling based on a previous exploratory factor analysis (Principal Axis Analysis with Promax rotation and Parallel Test [Horn, 1965]) to identify the underlying factors of the measures (Little et al., 2002). The exploratory factor analysis for the career decidedness scale revealed a 1-dimensional construct, explaining 37.9 percent of variance. Two parcels were constructed applying the random assignment method of items to parcels. The same item assignment was used for the parcels at both measurement points. These two parcels and the phase of career decision-making scale were then selected as the three indicators of career decidedness. The analysis of the social support scales revealed a 4-factorial solution corresponding exactly to the four theoretically proposed sources of support from parents, teachers, friends, and organizations, explaining 54.7 percent of variance. The item parcels were constructed based on the construct representative approach (i.e., items from each factor are approximately equally distributed among the three indicators). The analysis for the externality and neuroticism scales implied a 3-factorial solution with the components of externality (all items from this scale), and two components of within neuroticism representing emotional instability (8 items), and negative affect (3 items from the neuroticism scale tapping experiences of anxiety, loneliness, and sadness), explaining 38.4 percent of variance. Three parcels out of these three factors were constructed using the construct representative approach. For the latent variable engagement no parceling was necessary since it was already represented by three scales of sufficient diversity to represent the construct (self-exploration, environment-exploration, and career planning).

#### Analysis of research hypotheses

Data were analyzed with AMOS 16 applying the maximum likelihood method. First, the measurement model with unconstrained relations among the latent variables was assessed, which is recommended (Kline, 2005) to provide information about the quality of the factor structure of the model, independent of the proposed path model. As seen in Table 2, the measurement model provided a good fit to the data, indicating a valid measurement of the latent variables by the included scales with confirmatory factor analysis.

Next, the first model proposing fully mediated effects of social support and personality via engagement on the outcome measures was assessed. As seen in Table 2, the model fit the data very well and the fit of the path model (measured as the difference between the measurement model and the full structural model) also showed very good fit ( $\chi^2 = 18.9$ ,  $df = 12$ ;  $p = .14$ ; RMSEA = .041).

The second model proposing only direct and no mediated effects of support and personality on the outcome measures congruence and decidedness was assessed. As shown in Table 2, the model also showed a good fit to the data. However the path model showed only poor fit ( $\chi^2 = 79.06$ ,  $df = 10$ ;  $p < .001$ ; RMSEA = .140) and the GFI index indicated a worse fit than the previous model.

**Table 2**  
Model Fit Indices.

Model	$\chi^2$	$df$	$p$	CFI	GFI	NFI	RMSEA (90% CI)	SRMR
Measurement	266.74	128	.000	.964	.925	.934	.056 (.046–.065)	.049
Fully mediated	285.60	140	.000	.962	.921	.929	.055 (.046–.064)	.060
Non-mediated	345.80	138	.000	.946	.908	.914	.066 (.057–.074)	.087
Partially mediated	276.78	136	.000	.964	.924	.932	.055 (.045–.064)	.056

The third proposed model which proposes partially mediated effects of support and personality on the outcome measures (Fig. 1) showed a very good fit to the data and a strong path model ( $\chi^2 = 10.04$ ,  $df = 8$ ;  $p = .260$ ;  $RMSEA = .027$ ). As expected, early decidedness led to more engagement during the career decision-making process. Engagement predicted an interindividual increase in both congruence and decidedness. Problematic personality traits were negatively related to decidedness as measured at the beginning of the process but had no significant effect on development of decidedness or congruence over time. However, it predicted *more* engagement. More social support predicted more engagement, but the expected relations of social support on change in decidedness and congruence were not found.

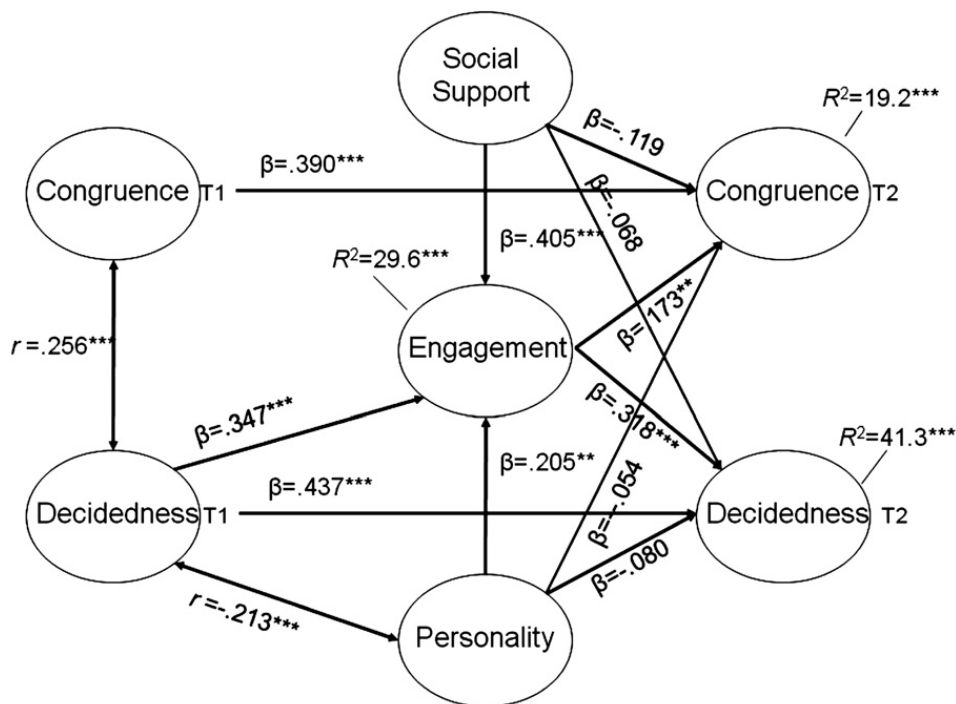
Because the other two models were nested in this model, they were compared with the chi-square difference test. The results showed that the partially mediated model provided significantly better fit to the data compared to the non-mediated model but nonsignificant better fit compared to the fully mediated model. This indicates that the more parsimonious model proposing that social support and personality effect development of congruence and decidedness only indirectly through engagement should be accepted as the best of the three models.

### Gender differences

The structural models above had up to 54 parameters to estimate with 349 subject cases, so we decided not to use standard multiple-sample cross-validation procedures because this would have reduced the ratio of cases to parameters to an unacceptably low level of about 3:1 for each gender group (Kline, 2005). Instead, we calculated factor scores using principal axis functioning with the same indicators for each factor as used in the structural models. Univariate *t*-Test comparisons between genders showed that, controlling for increased probability for Type I error with Bonferroni adjustment, girls reported less choice congruence than boys at T1 ( $p = .001$ ,  $d = .35$ ) and T2 ( $p = .004$ ,  $d = .32$ ) but no gender differences in the other factors. We then compared bivariate Pearson correlations among the factors across genders. No significant differences emerged, indicating that the variables are related in basically the same way across genders.

### Discussion

Results of this study offer important information regarding early adolescent career development processes. Most notable is the strongest effect on congruence and decidedness at the end of the career decision-making process came from the autoregressive paths. This means that the state at the beginning of the career decision-making process was the strongest predictor of the later state in these measures. As found in other studies with older participants (Creed, Patton, & Prideaux, 2006; Saka & Gati, 2007), early measures of career development status, therefore, provide important signals regarding those students who may be at risk for or experience extended career indecision. Although in certain contexts (i.e., ones where there is no substantial press for making educational and career decisions that have significant long-term implications) prolonged



Note: \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$

Fig. 1. Results of the latent variable structural equation modeling for the combined model ( $N = 349$ ). Note: \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$ .



states of indecision for eighth grade students may not necessarily be problematic. However, in contexts such as the one inhabited by our study participants, persistent indecision presents obstacles to educational and career planning. For them, choices influencing immediate and distal educational and career trajectories were expected and required.

Of the three assessed models, only the two models proposing that engagement is affected by social support and personality received support. The model proposing that by personality and social support would only directly predict congruence and decidedness was not supported. Social support was a significant predictor of more engagement which supports the importance of environmental factors for positive adolescence career development in conjuncture with individual engagement. Problematic personality characteristics showed the expected negative relation to initial level of decidedness. However, contrary to the expectation, maladaptive personality traits related positively to engagement. While unexpected, this result corresponds to the two-sided component of problematic personality found in the identity literature with neuroticism being negatively related to identity commitment but positively to continued, ruminative exploration (Luyckx et al., 2008). It also shows similarities to the study results by Vignoli et al. (2005) who found that certain aspects of anxiety (e.g., fear of failure) related positively to career exploration among French high school students. It might therefore be that being less emotional stable and perceiving ones live to be controlled by external forces promotes a sense of uneasiness with the career decision-making process which in turn promotes more activation in exploring different options. Future research could investigate to what extent this might lead to a different way of engagement (e.g., less directed exploration, more ruminative) or whether differential effects occur compared to students whose engagement is promoted by control and positive emotions.

As expected, engagement was also positively predicted by early decidedness and goal clarity, confirming the notion that early, even tentative goals are useful as they facilitate more agency or engagement in the career process. This finding is similar to results obtained by other researchers who found that achieved identity is related to more career exploration (Blustein, Devenis, & Kidney, 1989), and that general identity commitment is positively related to in depth identity exploration (Luyckx, Goossens, & Soenens, 2006).

Most importantly, the study underscore the importance of the specific behaviors of adolescents in the career decision-making process in terms of their active engagement in planning and exploration as two core components of career adaptability (Hartung, Porfeli, & Vondracek, 2008). In fact, besides the autoregressive effects, engagement showed the strongest effect on the outcome measures congruence and decidedness. This implies that adolescents are active agents in their career decision-making process and are not merely determined by relatively stable dispositions or environmental factors, a notion which corresponds to adolescent development more generally (Lerner & Castellino, 2002).

Also important, although the study found that girls, on average, report less choice congruence compared to boys, the basic relations across variables were statistically the same across genders. Although Creed et al. (2005) reported that girls were more likely to show consistent career in decidedness than boys, the present study did not indicate that girls show more difficulties than boys in reaching career decidedness. However, they were more challenges with reaching a congruent career choice. This result might be explained by the systemic mismatch in Switzerland of types of vocational educations, which mainly correspond to realistic interests, and typical female interests in the social and artistic fields (Hirschi, 2009). However, the study suggests that active engagement is useful and facilitative for boys and girls equally to increase their choice clarity and congruence. On a general level, the results support the importance of investigating both personal and environmental factors in order to better understand adolescent career development processes. However, the results suggest that both exert their influence on adolescent career development outcomes in terms of decidedness and choice congruence largely mediated by the degree of individual engagement a student exhibits in the career preparation process.

### Limitations

One limitation of the study is that social support and personality were assessed cross-sectional regarding the outcome measures at T2 which limits the casual interpretation of the presented paths. To assess the amount of perceived social support during the career decision-making process, this variable needed to be measured at the end of the process. The decision to assess the personality characteristics at the end and not at the beginning of grade eight was based on the assumption that these are relatively stable constructs, but a later assessment when students were somewhat older would result in a more valid estimation (Roth, 2002). Also, we chose to represent career engagement as a latent construct represented by the increase and level of career planning and absolute average level of reported career exploration behaviors. Other studies might choose different indicators and measurement approaches. For example, it might be that exploration and planning are differently affected by social support and personality which might be investigated by treating the measures as formative indicators to represent the latent construct. One strength of the study was that different measurement approaches were used for the outcome measures. However, all measures were obtained from a single source (i.e., the adolescents) and most were assessed by self-reports which induces bias due to shared method variance. Finally, the investigated time-span was rather short for developmental processes to occur and future research is needed to assess processes of personal career engagement, environment, and personality intersection over a longer period of time.

### Implications and conclusions

Despite these limitations, the study provides some important implications for practice. As the study shows, active engagement defined in terms of exploration and planning for career decision making is critical for adolescent career

congruence and decidedness. Supporting developmental-contextual views of career development, both personal and environmental factors are important as they affect the degree of individual engagement. The finding that early indecision is related to maladaptive personality and that it can negatively affect subsequent career outcomes implies that providing more intensive (small group and/or individual career counseling) and extensive (e.g., job shadowing, externship opportunities) for students demonstrating early career undecidedness is warranted. For participants in this study, having social support related to increased active engagement in their career development. Increasing opportunities for early adolescents to experience social support should become a priority for those charged with fostering positive career development among eighth grade students (i.e., school counselors, teachers). Group oriented career interventions and mentoring programs provide examples of opportunities for social support among early adolescents. Finally, along with support, providing adolescents with opportunities for autonomous self/environmental exploration (e.g., online assessment tools, extracurricular opportunities) and engaging career planning tools (e.g., portfolios) are useful for career congruence and decidedness.

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