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Longitudinal links between career adaptability and academic achievement in adolescence

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ABSTRACT

Contemporary youth spend increasingly longer time in the educational system, where their career pursuits become closely intertwined with their educational goals. As career development is a life-long process, adolescents start working on their careers long before they engage in actual work behaviors. Therefore, in order for school to adaptively prepare youth for their future work lives, career adaptability and academic achievement should be reciprocally and positively linked throughout adolescence. To date, more longitudinal proof for these relations is needed. To address this shortcoming, we investigated cross-lagged associations between these two constructs in a three-wave longitudinal study, testing the moderating role of adolescents' gender, school type, and age. Participants were 1151 adolescents (41.3% boys), who completed the same paper-and-pencil measure three times across an academic year. Results showed positive reciprocal associations between career concern and academic achievement (i.e., Grand Point Average). This indicates that adolescents with a strong future orientation, who were already invested in career planning activities tended to perform better in school and vice-versa, high academic achievement further strengthened adolescents' positive outlooks on their vocational future. We also detected positive unidirectional links from academic achievement to career control and career confidence across one academic year. Interestingly, we did not find significant longitudinal links between career curiosity and academic achievement. These patterns of longitudinal relations applied equally to boys and girls, to those attending university-preparatory and work-bound schools, and to early-to-middle and middle-to-late adolescents. Research and applied implications of these findings are detailed.

1. Introduction

A core axiom of educational systems is that school prepares youth for their future life, which includes preparation for their career. School represents the main "job" adolescents have, and it is a long-term protective environment for personal and vocational development. Hence, education can be viewed as a form of social capital (Coleman, 1988), as it guides the acquisition and improvement of strategies to approach authority figures (e.g., teachers) and learning tasks, gradually crafting adolescents' life pursuits, learning patterns, and identities. As youth spend increasingly longer time in the educational system, their career goals become closely intertwined with their educational goals (Heckhausen & Tomasik, 2002; Negru, 2012; Negru, Pop, & Opre, 2013).

One of the main educational goals is academic achievement. Academic achievement is a multidimensional construct (Stipek & Weisz, 1981), most often operationalized through the grades adolescents receive in school, more specifically their Grand Point Average or GPA (Poropat, 2009). Academic achievement has a strong influence on the occupational paths students take as they make

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the transition to adulthood (Schnabel, Alfeld, Eccles, Köller, & Baumert, 2002; Strenze, 2007) and it directly impacts their motivation and global learning strategies (Richardson, Abraham, & Bond, 2012). Accordingly, it is reasonable to assume that adolescents' readiness and resources in approaching career issues (i.e., their career adaptability, Savickas, 2013) are also linked to their level of academic achievement. To date, more longitudinal proof for these relations is needed, in order to provide an in-depth understanding of how career adaptability is associated with academic achievement across time. To approach this shortcoming, we investigated the cross-lagged associations between academic achievement and career adaptability in a three-wave longitudinal study, including the moderating role of adolescents' gender, type of schooling, and age.

2. Understanding the links between career adaptability and academic achievement

When conceptualizing career development as a life-long process, one must take into account the fact that young people start working on their careers long before they engage in actual work behaviors (Hartung, Porfeli, & Vondracek, 2008). Therefore, school, as a dominant social environment in adolescence, provides strong cues (e.g., perceived competence in different academic areas, personal interests that are linked to school activities) for adolescent career socialization (Roeser, Eccles, & Sameroff, 2000). These cues gradually channel important vocational choices (e.g., choice of a university or of occupational preparatory training programs). For instance, longitudinal studies have reported that adolescents' GPA shapes their educational and vocational aspirations and their career goals (Dubow, Huesmann, Boxer, Pulkkinen, & Kokko, 2006; Vuolo, Mortimer, & Staff, 2014). Adolescents with a higher GPA during high-school tended to aspire and commit to university-degree careers, transitioned more effectively from school to work, and entered jobs that matched their educational background (Vuolo et al., 2014). These findings suggest that high academic achievement (i.e., high GPA) is related to adolescents' career adaptability, viewed as their readiness and resources for coping with career issues (Savickas, 2013).

One core set of psychosocial resources with high impact on career self-regulation refers to career adapt-abilities (Savickas, 2005), which adolescents actively use in constructing their careers and in approaching age-appropriate developmental tasks and transitions (e.g., choice of an educational track, engagement in work-preparatory behaviors). These adapt-abilities, also called the 4Cs of career adaptability, are: concern (i.e., one's preoccupation with the future, viewed as the personal value attached to preparing for tomorrow), control (i.e., a focus on making career choices in a conscientious and responsible manner), curiosity (i.e., one's inquisitiveness regarding possible vocational paths, through an exploration of different alternatives), and confidence (i.e., a strong belief in one's capacity to overcome career barriers and a focus on success when approaching these barriers). Adapt-abilities play an important role in preparing young people for important career decisions (e.g., perception of fewer career barriers, Soresi, Nota, & Ferrari, 2012), in ensuring a high level of satisfaction and well-being, and in empowering them to pursue adaptive goals (e.g., Hirschi, 2009; Stringer, Kerpelman, & Skorikov, 2012; Wilkins et al., 2014). As the student role is the dominant social role during adolescence, it is important to further investigate how career adaptability may be linked to academic achievement.

Academic achievement validates personal competencies (e.g., an adolescent considers he/she has strong Math skills because of the high grades in this school subject), strengthens pre-existing career goals (e.g., high academic achievement confirms one's choice of going to university after high-school graduation), and guides the planning of new vocational paths (e.g., high grades in a new school subject may make an adolescent consider new options for an occupation in this field). Thus, academic achievement influences career development in a myriad of ways. For instance, in a longitudinal study on employees, Zacher (2014a) reported that education (i.e., the highest level of educational attainment) positively predicted career concern. In this respect, longitudinal proof of the relation between career adapt-abilities and academic achievement (i.e., adolescents' GPA) would close a “missing link” and bring important input on how academic achievement influences their resources and strategies for building their careers.

This would be a valuable addition to vocational interventions in educational settings. Specifically, it could help career counselors make good use of adolescents' pre-existing career adapt-abilities and/or academic achievement in order to increase their intentionality in approaching educational and career issues (Savickas et al., 2009). Also it would ground career interventions on empirically-driven relations between the two variables. Still, to date very few studies have analyzed the relation between career adaptability and academic achievement in adolescence, especially from a longitudinal perspective.

3. The present study

We analyzed how career adaptability and academic achievement influenced each other across one academic year using a three-wave longitudinal study.

The study measured academic achievement through the Grand Point Average or GPA, which is the mean of grades a student receives for all school subjects. The GPA is a dominant and reliable operationalization of academic achievement (Bacon & Bean, 2006; Poropat, 2009; Richardson et al., 2012). It is a strong predictor of multiple positive outcomes of adolescence and adulthood, like university attendance and graduation (Vuolo et al., 2014) and consequently achievements in the work-place (Roth, BeVier, Schippman, & Switzer, 1996). As the school context provides a stable ground for the development of multiple personal and social attributes (see Poropat, 2009 and Richardson et al., 2012 for extensive reviews), it is sound to assume that it also informs the development of career adaptability in adolescence. As previously detailed, career adapt-abilities are positive psycho-social resources and strategies that help people cope with vocational issues (Savickas, 2005). In adolescence, most career issues are related to one's education, as school is the dominant context of development in this time-frame. In this context, the GPA has a strong

informative (e.g., "It is worth thinking about going to college based on my GPA.") and also formative value (e.g., "From my GPA I can see that in order to choose a certain occupational path I have to invest more in my schooling.") for an adolescent's career adaptability. The GPA informs adolescents about their standing in terms of global educational achievement and it has a strong formative input on his/her career beliefs and behaviors. Hence, we expected academic achievement to positively predict career adapt-abilities during one academic year. Additionally, as numerous studies have highlighted that career concern is the most important adapt-ability and also the strongest longitudinal predictor of positive adaptation dimensions (e.g., Hirschi, Herrmann, & Keller, 2015; Zacher, 2014b), we also expected career concern to be positively linked to academic achievement longitudinally. Adolescents who are able to project themselves into the future, who link present actions with future outcomes and plan how to attain these outcomes, may be more likely to invest in their academic achievement, hence having a higher GPA level.

Hypothesis 1. There are positive longitudinal relations between career adapt-abilities (i.e., concern, control, curiosity, confidence) and academic achievement (i.e., GPA). Academic achievement positively predicts career adapt-abilities longitudinally (Hypothesis 1a). In turn, career concern also predicts increases in academic achievement across time (Hypothesis 1b).

Second, in analyzing the longitudinal relations between career adapt-abilities and academic achievement, we investigated the moderating role of several core socio-demographic variables: adolescents' gender, type of school, and age. We focused on analyzing gender differences, as this variable tends to play an important role in educational and vocational development patterns in adolescence, often due to genderized work socialization (Hartung, Porfeli, & Vondracek, 2005). Then, we looked at the type of school adolescents attended, which may differentially focus them on academic achievement and vocational development. Adolescents attending theoretical schools focus more on acquiring knowledge and skills valuable for future university studies, while those enrolled in vocational schools prepare for a specific occupation, which could allow them integration in the labor market directly after graduation. So, the former are university-bound schools and the latter are work-bound schools (Creed, Patton, & Hood, 2010). Last, we investigated age differences, focusing on early-to-middle and middle-to-late adolescence, which represent developmental windows associated with different educational contexts and requirements (e.g., adaptation to high-school in early-to-middle adolescence versus preparation for school-to-school or school-to-work transitions in middle-to-late adolescence, Hartung et al., 2005). Using adolescent samples, several longitudinal studies (e.g., Guan et al., 2015; Negru-Subtirica, Pop, & Crocetti, 2015; Stringer et al., 2012) pointed out that these socio-demographic variables do not moderate the associations between career adaptability and different personal characteristics (e.g., adjustment, vocational identity, personality). Therefore, we did not expect gender, type of school, and age to moderate the relationships between career adaptability and academic achievement.

Hypothesis 2. Gender, type of school, and age do not moderate the longitudinal relations between career adaptability and academic achievement.

4. Methods

4.1. Participants and procedure

This study used data from the three-wave longitudinal study entitled Transylvania Adolescent Identity Development Study (TRAIDES). The total sample comprised 1151 adolescents from seven schools in North-Western Romania (M_{age} = 16.45, SD_{age} = 1.40; range = 13–19 years). In the total sample 58.7% were girls and 41.3% were boys, 40.1% were early-to-middle adolescents (age range 13–15 years) and 59.9% were middle-to-late adolescents (age range 16–19 years), and 48.5% were students in theoretical schools and 51.5% were students in vocational schools. All participants completed the same self-report questionnaires at three different time points during one academic year, with an interval of 3 to 4 months between the measurement points. The questionnaires were completed in classrooms during school hours. Participation in the study was voluntary and anonymous. The study was approved by the Faculty of Psychology and Educational Sciences of the first author's university and by the schools' headmasters through written collaboration protocols.

Overall, 21.65% of data were missing from Time 1 to Time 3. The range of missing items varied from 16.2% to 43.1% across the three waves. Little's (1988) Missing Completely at Random (MCAR) test on the variables of interest yielded a normed χ^2 (χ^2/df) of 1.24. According to guidelines provided by Bollen (1989), this indicates that data were probably missing at random. Thus, we employed the full information maximum likelihood (FIML) procedure in Mplus 6.12 (Muthén & Muthén, 1998–2010). FIML employs all available information (including information from participants with missing data) to estimate the model parameters (Enders, 2010).

4.2. Measures

4.2.1. Career adaptability

We measured career adaptability with the Career Adapt- Abilities Scale (CAAS)—International Form 2.0, an instrument which showed excellent psychometric properties cross-culturally (Negru-Subtirica et al., 2015; Porfeli & Savickas, 2012; Savickas & Porfeli, 2012). The CAAS — International Form 2.0 consists of 24 items, divided equally on four subscales which appraise specific adapt-ability resources, namely: concern (e.g., "Planning how to achieve my goals"), control (e.g., "Taking responsibility for my

actions"), curiosity (e.g., "Observing different ways of doing things"), and confidence (e.g., "Taking care to do things well"). Participants responded to each item on a scale from 1 (not strong) to 5 (strongest). The values of Cronbach's alphas for the four subscales varied from .74 to .80 at Time 1; from .78 to .84 at Time 2; and from .81 to .86 at Time 3.

4.2.2. Academic achievement

We measured educational achievement through students' average grades obtained in all subjects (GPA). At Time 1, students self-reported the GPA they had achieved in the previous academic year (2013–2014) and at Time 2 the GPA they had achieved in the first semester of the academic year 2014–2015. At Time 3, the GPA for the second semester of the academic year 2014–2015 was collected from official school records. Self-reported GPA is highly correlated with actual GPA ($r = .90$; Credé & Kuncel, 2013) and it predicts school outcomes in the same way as actual GPA (Baird, 1976). In the Romanian grading system, grades range from 1 (minimum) to 10 (maximum).

5. Results

5.1. Preliminary analyses

Mean scores, standard deviations, and correlation coefficients for study variables appear in Table 1. Adolescents' career concern, control, curiosity, and confidence related positively to their academic achievement (i.e., GPA) at all time-points.

5.2. Cross-lagged analyses

We tested for cross-lagged associations between career adaptability and educational achievement (e.g., career adaptability dimensions measured at Time 1 predicting educational achievement at Time 2 and educational achievement at Time 1 predicting career adaptability at Time 2), controlling for: (a) first-order autoregressive paths (e.g., career adaptability dimensions at Time 1 predicting career adaptability dimensions at Time 2); (b) second-order autoregressive paths (e.g., career adaptability dimensions at Time 1 predicting career adaptability dimensions at Time 3); and (c) within-time correlations among all the variables.

To model the reciprocal associations between career adaptability and educational achievement as parsimoniously as possible, we tested whether cross-lagged effects were time invariant (i.e., assumption of stationarity). Consequently, we compared the model in which cross-lagged paths were free to vary with the model in which they were fixed across time. To determine significant differences between these two models at least two out of these three criteria had to be matched: $\Delta\chi^2$ significant at $p < .05$, $\Delta CFI \geq -.010$, and $\Delta RMSEA \geq .015$ (Byrne, 2012). Results brought forward that the model in which cross-lagged effects were time invariant was not substantially different ($\Delta\chi^2$ (20) = 20.34, $p = .436$, $\Delta CFI = 0$, $\Delta RMSEA = -.003$) from the model in which these effects were allowed to vary across time. Therefore, we could retain the more parsimonious time-invariant model as the final one.

This model fit the data very well, $\chi^2 = 43.31$, df = 40, CFI = .999, RMSEA = .008, SRMR = .022. Significant standardized cross-lagged paths are reported in Fig. 1. The magnitude of these effects is meaningful when predicting change in longitudinal autoregressive models, as we controlled for stability effects (i.e., previous scores on the outcome) hence eliminating a significant amount of the variance in the outcome variables (Adachi & Willoughby, 2015).

Table 1
Descriptive statistics and correlations among the study variables from Time 1 to Time 3.

Variable	Descriptives	Correlations from Time 1 to Time 3													
	M (*SD*)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. ConcT1	3.91 (0.72)	–													
2. ConcT2	3.88 (0.74)	.48***	–												
3. ConcT3	3.83 (0.75)	.48***	.49***	–											
4. ContT1	3.98 (0.65)	.43***	.22***	.28***	–										
5. ContT2	3.93 (0.67)	.30***	.50***	.27***	.42***	–									
6. ContT3	3.90 (0.70)	.34***	.33***	.60***	.42***	.41***	–								
7. CuriT1	3.73 (0.68)	.57***	.36***	.37***	.46***	.32***	.31***	–							
8. CuriT2	3.70 (0.70)	.41***	.60***	.42***	.31***	.50***	.38***	.49***	–						
9. CuriT3	3.72 (0.72)	.37***	.36***	.67***	.28***	.31***	.58***	.44***	.52***	–					
10. ConfT1	3.83 (0.65)	.51***	.31***	.31***	.59***	.35***	.34***	.60***	.39***	.30***	–				
11. ConfT2	3.80 (0.66)	.43***	.54***	.40***	.40***	.58***	.45***	.40***	.64***	.44***	.53***	–			
12. ConfT3	3.77 (0.69)	.36***	.37***	.65***	.38***	.38***	.68***	.36***	.44***	.69***	.44***	.53***	–		
13. GPAT1	8.48 (0.98)	.26***	.30***	.29***	.08**	.19***	.21***	.17***	.16***	.13***	.13***	.23***	.20***	–	
14. GPAT2	8.39 (1.05)	.30***	.32***	.31***	.11***	.19***	.21***	.20***	.22***	.16***	.16***	.24***	.21***	.90***	–
15. GPAT3	8.43 (1.13)	.26***	.31***	.29***	.06*	.16***	.21***	.17***	.16***	.13***	.12***	.18***	.20***	.82***	.83***

Note. Conc = concern; Cont = control; Curi = curiosity; Conf = confidence; GPA = grade point average; T1 = Time 1; T2 = Time 2; T3 = Time 3; *M* = mean; *SD* = standard deviation.

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

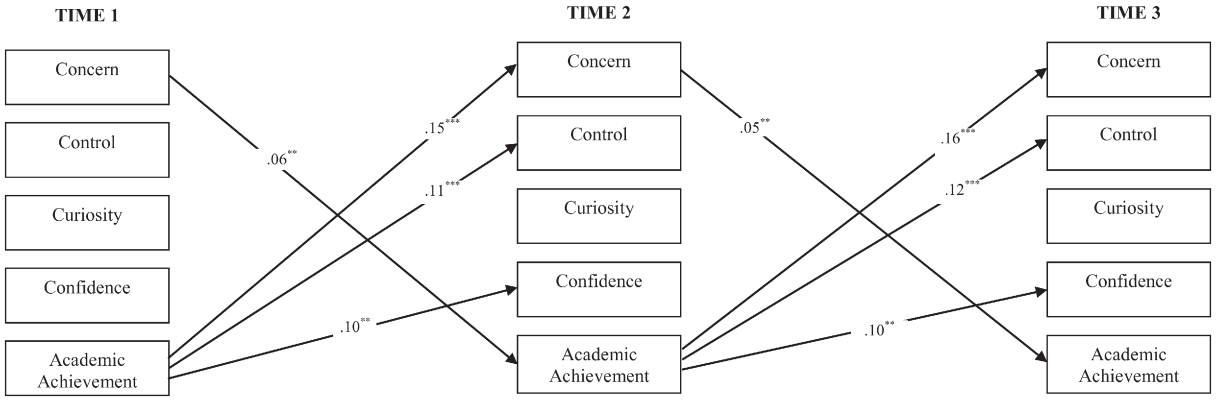

Fig. 1. Significant cross-lagged paths. For the sake of clarity, within-time correlations, stability paths, and regression paths between career adaptability dimensions and for academic achievement are not reported. *$p < .05$, **$p < .01$, ***$p < .001$.

Results pointed out positive reciprocal associations between career adaptability and educational achievement (i.e., GPA). Hypothesis 1a was partially confirmed, as GPA was a positive predictor of career concern, career control, and career confidence. Interestingly, GPA did not significantly predict changes in career curiosity longitudinally. As expected (Hypothesis 1b), career concern had a significant positive effect on GPA and vice-versa, higher levels in GPA predicted increases in adolescent career concern across time.

We conducted multi-group analyses to test whether cross-lagged paths from career adaptability to educational achievement and from educational achievement to career adaptability were significantly moderated by gender, type of school, and age. As hypothesized (Hypothesis 2), results indicated, for gender ($\Delta\chi^2$ (20) = 23.835, $p = .249$, ΔCFI = −.001, ΔRMSEA = .004), school type ($\Delta\chi^2$ (20) = 24.783, $p = .209$, ΔCFI = −.001, ΔRMSEA = .002), and age ($\Delta\chi^2$ (20) = 24.883, $p = .205$, ΔCFI = −.001, ΔRMSEA = 0) that the unconstrained model, in which parameters were free to vary across groups, was not significantly different from the constrained model, in which the parameters were fixed across groups. Therefore, the pattern of results detailed in Fig. 1 was the same for boys and girls, for adolescents enrolled in theoretical and vocational schools, and for early-to-middle and middle-to-late adolescents.

6. Discussion

To date, more proof on the longitudinal links between career adaptability and academic achievement is needed. Towards this end, we conducted a three-wave longitudinal study on a large sample of adolescents, investigating how career adapt-abilities (i.e., concern, control, curiosity, and confidence) are associated with academic achievement (i.e., GPA) across one academic year. The results indicated positive reciprocal relations between career concern and GPA. We also uncovered positive unilateral links from academic achievement to career control and confidence. We did not depict associations between career curiosity and academic achievement across time. These results were not moderated by adolescents' gender, type of school, and age.

6.1. Career concern positively predicted academic achievement longitudinally and vice-versa

The study indicated positive reciprocal associations between career concern and academic achievement (i.e., GPA). This indicates that adolescents with a strong future orientation, who were already invested in career planning activities tended to perform better in school and vice-versa, high academic achievement further strengthened adolescents' positive outlooks on their vocational future. Career concern is viewed as the most important adapt-ability (Savickas, 2005), because it reflects an adolescent's capacity to project himself/herself into the future and to envision a possible vocational self that best incorporates personal strengths. From a longitudinal perspective, Hirschi et al. (2015) highlighted that career concern mediates the relation between core self-evaluations and proactivity, and it protects young people from career-decision difficulties. Also, it predicted positively career planning, exploration, and self-efficacy across time. Without the capacity of career concern, vocational development would be solely grounded on present experiences, which could not be organically structured into a coherent and meaningful life-design (Savickas et al., 2009). Therefore, the reciprocal longitudinal links between career concern and academic achievement highlight that an active focus on developing a future orientation in adolescence also has short-term benefits, in that it is linked to higher academic achievement in the span of a school year. In a nutshell, working on one's projections into the future (e.g., setting career goals, developing and monitoring career plans) is also very valuable for one's present.

Additionally, the fact that academic achievement (i.e., GPA) predicted increases in career concern across time highlights that good grades strengthen adolescents' future focus, most probably because they are an important source of self-worth in this developmental time-frame (Poropat, 2009; Richardson et al., 2012). As previously detailed, for adolescents attending school is a “job” and accordingly, their personal identities are closely linked to their academic achievement, which is a main short-term outcome of their social role as students (Pop, Negru-Subtirica, Crocetti, Opre, & Meeus, 2016). It is quite probable that an adolescent with high GPA will become more preoccupied with understanding how this indicator of academic achievement can best be integrated into

his/her future vocational self. He/she can reflect on the occupations that best match his/her GPA level (e.g., choice of future educational paths), on the complexity of these future career strivings (e.g., selection of a single occupational goal versus focus on multiple career goals), or on the contents of these strivings (e.g., diverse combinations of vocational, relational, family, educational goals).

These positive reciprocal longitudinal links between career concern and academic achievement are very valuable from an applied intervention perspective. As career counselors work with adolescents, one major difficulty in establishing a good work alliance resides in the adolescent's limited understanding of how his/her schooling impacts his/her future work life and his/her life in general (Hartung et al., 2005). On the one hand, for higher-achieving students counseling interventions could focus on underlining how academic achievement can foster their vocational development, in order to strengthen their future orientation. On the other hand, for lower-achieving students an exploration of their representations for the future (e.g., through role-playing or imagery activities) could aid their present investment in academic activities and possibly slowly increase their GPA. They could gradually become aware of how their concern for a vocational future helps them make sense of and assign personal significance to their academic achievement.

6.2. Academic achievement positively predicted career control and confidence longitudinally

Our study also depicted positive unidirectional links from academic achievement (i.e., GPA) to career control and career confidence across one academic year. The pattern of relations suggests that these career adapt-abilities are stimulated by high levels of academic achievement, and correspondingly they are inhibited by low levels of academic achievement. Career control has been linked to individual agency and self-determination (Blustein & Flum, 1999), as it gives adolescents a "personal ownership of the future" (Hartung et al., 2008, p. 57). Additionally, career confidence empowers adolescents to tackle and rise above subjective and objective career barriers, through persistence in the face of difficulties (behavioral component) and self-efficacy beliefs regarding one's ability to prevail over career obstacles (Savickas, 2005, 2013).

Our findings tend to indicate that at least during adolescence, in the span of one academic year, the level of academic achievement (i.e., GPA) promotes and stimulates the manner in which youth position themselves towards their career in terms of personal ownership of their career path and empowerment in pursuing this path. Hence, it seems that one's GPA has a strong longitudinal impact on these adapt-abilities and not the other way around. The GPA is a complex reflection of multiple components of academic and personal functioning (e.g., performance in different school subjects, teacher appraisals, persistence in learning tasks, class attendance, active engagement in classroom activities; see Poropat, 2009 for an extensive review). Therefore, one's career control and confidence are driven by one's GPA level.

From an applied intervention perspective, this indicates that in order to strengthen adolescents' ownership of their future and to empower them in approaching career barriers, career counselors should first focus on helping them comprehend how their academic achievement influences their career prospects. For some adolescents the long-term role of academic achievement may be either irrelevant, or unclear, as their developmental priorities may not specifically focus on the career domain (Roisman, Masten, Coatsworth, & Tellegen, 2004). By helping adolescents understand how their academic achievement supports their control and confidence adapt-abilities, counselors can actively tap into the manner in which academic achievement fosters agentic ownership of one's career and personal empowerment in developing a career.

6.3. Career curiosity was not linked to academic achievement in the span of one school year

Interestingly, we did not detect significant longitudinal links between GPA and career curiosity, viewed as an adolescent's "inquisitiveness about and exploration of the fit between self and the work world" (Savickas, 2005, p. 55). Hirschi et al. (2015) pointed out that career curiosity is a multi-faceted adapt-ability, in that an individual's inquisitiveness can be distinct from or even hinder his/her career pursuits. Namely, they brought forward that high levels of career curiosity were linked to lower levels of career planning after a six months period. Our results indicate that in the span of one academic year adolescents' career curiosity was not stimulated by their level of academic achievement (i.e., their GPA). It may be that other types of career-relevant activities (e.g., extra-curricular activities, volunteering, direct work experiences) are more valuable for fostering this specific adapt-ability. In this respect, in line with previous recommendations (e.g., Hartung et al., 2008; Savickas, 2005), it may be more useful to appraise and investigate career curiosity in relation to other life domains beyond school (e.g., work, family, community). For instance, career curiosity can be effectively trained in the transition from school to work, helping new employees in findings higher quality jobs (Koen, Klehe, & Van Vianen, 2012).

6.4. Adolescents' gender, type of school, and age as moderators

Our results highlighted that the pattern of longitudinal relations depicted in Fig. 1 equally applied to boys and girls, to those attending university-preparatory and work-bound schools, and to early-to-middle and middle-to-date adolescents. These findings bring forward the robustness of the cross-lagged relations between career adapt-abilities and academic achievement (i.e., GPA). Also, they indicate that the above detailed suggestions for applied interventions based on the patterns of longitudinal associations may be useful for a large array of adolescents. Hence, for youth (regardless of their gender, type of school, and age) who invest resources (e.g., time, effort) in actively developing their careers, academic achievement represents a valuable indicator that the

career path and goals they envision are appropriate. As education is a form of social capital (Coleman, 1988), their academic achievement could further motivate and guide them in investing in their career development.

7. Strengths, limitations, and suggestions for future research

This study should be viewed in light of several strengths and limitations, which can potentially ground further research studies.

First, an important strength is that we analyzed academic achievement through a core indicator: adolescents' GPA. Still, we did not appraise how adolescents link their educational achievement to their self-worth (Covington, 1992) and their academic self-concept (Bong & Skaalvik, 2003), which could possibly influence its link to career adaptability. Therefore, future studies could also integrate measures of self-worth and academic self-concept, in order to offer a more complex image of academic achievement in relation to career adaptability.

Second, in analyzing the pattern of longitudinal associations between career adaptability and academic achievement, we looked at the moderating role of important socio-demographic variables: gender, type of school, and age. Nevertheless, these variables do not capture the social contexts in which adolescents develop their career adaptability and academic achievement. For instance, previous studies have highlighted the importance of family of origin in the academic and vocational development of adolescents (Whiston & Keller, 2004). Therefore, future studies could integrate and test the moderating role of family-related socio-demographic indicators (e.g., parental level of academic achievement, parental occupational status, family financial status).

A third strength of our study is that we looked at associations between career adaptability and academic achievement longitudinally, in the span of one academic year. However, we did not depict their links in a longer time-span (e.g., two or more school years) and we did not capture their reciprocal dynamics during educational transitions (e.g., from middle-school to high-school, from high-school to university) or school-to-work transitions. For instance, as adolescents transition to emerging adulthood and move to a different type of educational system (i.e., university), the relation between their career adaptability and their academic achievement may change. University studies focus more on developing youth autonomy and on preparing them for a specific occupation (Karaś, Cieciuch, Negru, & Crocetti, 2015; Negru, Pop, Damian, & Moraru, 2011; Negru, Subţirică, & Opre, 2011). Therefore, we could expect additional significant cross-lagged links from career adapt-abilities to academic achievement. In order to test these assumptions, future studies could span throughout longer time-frames and integrate educational and work transitions.

8. Conclusions

This study showed reciprocal longitudinal associations between career adaptability and academic achievement in adolescence. Career concern predicted positively academic achievement over time and vice-versa. Additionally, we detected positive unidirectional links from academic achievement to career control and confidence. The pattern of relations was independent of adolescents' gender, type of school, and age. These results have numerous research and applied implications.

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