



Motivation is not enough: how career planning and effort regulation predict academic achievement

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Abstract

Italy is among the EU countries with the lowest rates of college graduates. Preventing dropout rates, promoting better educational achievement and improving adult population well-being can all be accomplished by discovering factors that promote higher academic success. Thus, the current study's goal is to investigate personal factors that may have an impact on academic achievement (in terms of grade point average [GPA] and number of exams passed). We assume that identified academic motivation will indirectly affect academic achievement via students' perceived competence in career planning and through their capacity to regulate effort in learning. The present study was conducted at the Department of Agri-Alimentar Science and Technology of a huge university in northern Italy. A sample of 348 students (40.5% male; $M_{\text{age}}=21.13$ years; $SD_{\text{age}}=2.14$) voluntarily filled an online questionnaire. Analysis on collected data were performed using structural equation modelling using the Mplus software. The obtained results provided support to the hypothesized association between identified motivation and GPA, via the serial mediation of confidence in career planning and significant learning effort regulation ($\beta=0.10$, $SE=0.03$, $p=.006$), and between identified motivation and exams passed through the serial mediation of confidence in career planning and learning effort regulation ($\beta=0.10$, $SE=0.02$, $p=.009$). Our study extended the body of research on the association between identified academic motivation and academic achievement, by investigating the presence of some elements that mediate this relationship. The findings have several practical implications: in particular, they may be used to design specific actions to promote the educational success of university students – for example, the provision of specific training regarding learning effort management, without neglecting the importance of students' looking toward their own professional future.

Keywords Academic achievement · Undergraduates · Identified motivation · Confidence in career planning · Effort regulation

Introduction

Although the number of first-year students has increased in OECD countries, the annual number of graduates has remained constant (OECD, 2019). Italy, which has the second lowest percentage of graduates (28%) between the ages of 25 and 34 among EU nations, is severely affected by this problem. In fact, Italy has a 13.1 per cent dropout rate for 18–24-year-olds, higher than the European average of 9.9 per cent (European Commission, 2021).

Identifying student characteristics that improve academic success is a strategy to reduce dropout rates, encourage further education and promote the well-being of the adult population (Mazzetti et al., 2020). Supporting students' academic success also contributes to increasing well-being and preventing educational poverty, improving the professional

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and social prospects of families and society at large (Bargmann et al., 2022).

Therefore, general purpose of this study is to investigate the personal factors that affect academic achievement (i.e., GPA and exams passed). It especially looks at how identified academic motivation, capacity for long-term planning, and effort management affect students' academic success. The self-determination theory (SDT; 1985; 2012), developed by Deci and Ryan, is the foundational theories for framing the study.

Theoretical framework of identified academic motivation

Deci and Ryan's (1985; 2012) self-determination theory (SDT) is a modern, fast-growing theory that allows us to discriminate between different forms of motivation based on the causes and aims that drive an individual to engage in certain behaviour. This theory proposes a distinction between intrinsic motivation, which motivates people to do something because it is intrinsically engaging or attractive, and extrinsic motivation, which pushes people to do something because it has a certain outcome (Ryan & Deci, 2000, p.55).

According to SDT, intrinsically motivated learners perceive study as an engaging, enjoyable, and rewarding activity, and as a result, they engage and behave with a strong sense of purpose: as a result, intrinsically motivated behaviour is autonomous or self-determined (Ryan & Deci, 2000). Extrinsically motivated students, on the other hand, study at university for the instrumental value of this behaviour, such as gaining a better job once they graduate. The various styles of regulating students' academic motivation reflect their levels of autonomy, and motivation is better explained as a continuum from a motivation (absence of motivation) to intrinsic motivation via extrinsic motivation. The quality of extrinsic motivation varies according to the extent to which a behaviour is autonomous or self-determined (Ryan & Deci, 2000).

Identified motivation is the most autonomous and self-determined form of extrinsic motivation (Deci & Ryan, 2012), and it is typical of students who choose to attend university since it is important for their career and personal development (Girelli et al., 2018). This sort of academic motivation differs from intrinsic motivation in that the student's purpose is for success and behaviour (e.g., studying) to have instrumental value rather than being motivated by topic interest or personal enjoyment. Students who report identified academic motivation have an internal locus of control: they engage time and energy in studying because they understand the potential reward, therefore identifying with the task's relevance (Liu et al., 2019). In other words,

identified motivation characterizes behaviours (in this case, college study) that an individual selects voluntarily and is regarded as autonomous since it entails purposeful approval of the behaviour (Guay et al., 2020).

Studies have found that autonomous motivational control has a positive effect on college student success (e.g., Ramos Salazar & Meador, 2023). In recent years, several studies have begun to focus on other types of motivation independently, such as identified motivation, and are beginning to produce evidence to support the association with greater academic achievement. Students that have identified motivation put in more effort, have a positive perspective regarding their future and the chance of achieving their goals and can adopt successful techniques to overcome setbacks and problems (Nishimura & Joshi, 2021). Other research has found that autonomously motivated university students are less likely to drop out (Howard et al., 2021; Litalien & Guay, 2015), and they also report a higher level of adaption (Girelli et al., 2018). This association appears to be explained by the fact that students with more autonomous motivation perceive themselves as more competent (Ryan & Deci, 2000) and behave adaptively since their will and volition guide them (Litalien & Guay, 2015).

The purpose of this study is to investigate the impact of autonomous motivation and to determine whether and how identified motivation (which is autonomous yet extrinsic) effects the academic performance of university students. Therefore, we made the first assumption:

Hypothesis 1 *Identified academic motivation is positively associated with grade point average (GPA) (H1a), the number of exams passed (H1b), confidence in career planning (H1c), and the ability to regulate effort in learning (H1d).*

Proposed sequence between theoretical constructs

Identified academic motivation has been identified as a sort of regulation that is highly linked to occupational interests. As a result, we recommend expanding our understanding of the significance of this personal resource in improving students' academic achievement, beginning with the findings of Litalien and Guay (2015). Litalien and Guay (2015) assume that autonomous motivational regulation predicts perceived competence within the theoretical framework of SDT (Deci & Ryan, 1985, 2012), in contrast to conceptual models that consider perceived competence to be predictive of interests and motivations (e.g., Lent and Brown, 2013's Career Self-Management model). According to the authors, autonomous motivation motivates students to exert more effort in learning activities (for example, producing new ideas, questioning the utility of what they study, and so on).

This behavioural pattern leads them to improve their study skills and perceive themselves as more competent. Later studies have also supported this process (Guay et al., 2020).

According to the empirical evidence discussed, it may be argued that identified academic motivation – which represents a subtype of autonomous motivation – may be related to self-regulated learning strategies. In fact, self-regulated learning is defined as a self-directed process that enables students to convert their mental skills into academic skills (Zimmerman, 2002). A key strategy for self-regulated learning is effort regulation, understood as the ability to pace one's energy to optimize learning processes, persisting in the face of difficult situations in studies. Schneider and Preckel (2017) identified the ability to modify one's effort as one of the top 13 characteristics related with academic achievement in higher education in a remarkable meta-analysis. Academic motivation and effort regulation are thought to be inextricably linked and are both key predictors of academic achievement (Kizilcec et al., 2017; Umemoto, 2021). In fact, it is reasonable to assume that students driven by identified motivation are more likely to engage in self-regulated learning strategies because they are motivated by personally meaningful goals and are proactive in completing university assignments. As a result, the strategy that leads to high outcomes is not constantly working at their best, but rather being able to pick when and where to invest time and mental resources (Schneider & Preckel, 2017). This emphasizes the significance of considering this component in enhancing university students' academic achievement.

In accordance with these contributions, let us assume:

Hypothesis 2 *Effort regulation is associated with a higher GPA (H2a) and a greater number of passed exams (H2b).*

Our research also looks at the role of confidence in career planning, that refers to a student's belief in his or her capacity to plan the steps required to complete a career project (Nota et al., 2008). Active career planning comprises the process of building, reconstructing, and forming a cohesive and meaningful identity (Savickas, 2002). Previous research indicates that university students who engage in proactive career-planning behaviors regard themselves as more employable (Chiesa et al., 2020), implying that they will be able to stay their current job or find an equivalent or better one in the future (Vanhercke et al., 2014). Kleine and colleagues (2022) demonstrated how university students' career-planning skills and work-related self-efficacy help alleviate dysfunctional future ideas and career anxiety. In other words, students who have confidence in their ability to plan their careers tend to be more upbeat about the future because they feel capable of meeting the challenges that lie ahead. Furthermore, studies have revealed that students who

have a strong future orientation, that is, who are involved in career-planning activities, are more successful academically, as measured by higher GPA (Mazzetti et al., 2020). As consequently, students who perceive reasons related to their formative-professional identity as the primary reason for studying in university education (that is, who have an identifiable academic motive) feel more competent and confident about their career-planning abilities. For the reasons listed, let us assume:

Hypothesis 3 *Confidence in career planning is positively associated with GPA (H3a) and with the number of exams passed (H3b).*

Recent studies have shown a positive relationship between university students' career maturity, self-regulated learning strategies and employability (Hsu et al., 2022). University students who are more confident and clearer about their job aspirations can self-regulate their learning and direct their efforts more successfully during their academic experience. These same students work hard to examine, monitor, and adapt their learning processes to attain better results (Beishuizen & Steffens, 2011). From this perspective, self-regulated learning strategies are adaptive behaviours that enable university students not only to achieve short-term positive outcomes (e.g., higher grades or a higher number of passed exams) but are considered important in the career-building process (Hsu et al., 2022). However, the relationship between this specific career resource and self-regulated learning strategies (such as effort regulation) is far from clear. We aim to understand whether confidence in one's own career planning abilities leads the student to enhance the ability to regulate effort. In other words, we believe that students who are more optimistic and proactive about their planning skills could effectively orchestrate their effort towards academic tasks. For these reasons, we hypothesise:

Hypothesis 4 *Confidence in career planning is positively associated with student's effort regulation in learning.*

Considering the theoretical premises presented, we consider that the positive association between identified academic motivation and academic achievement may be mediated by other student characteristics, hence we also hypothesise the following indirect relationships:

Hypothesis 5 *The positive impact of identified academic motivation on academic grade point average (GPA) is*

serially mediated by the perceived ability to plan one's future career and the ability to regulate effort in learning.

Hypothesis 6 *The positive impact of identified academic motivation on the number of passed exams is serially mediated by the perceived ability to plan one's future career and the ability to regulate effort in learning.*

Method

The present study is part of a larger project that aim to assess the students' needs throughout their academic careers and to develop tools and measures to enhance their skills for academic success. Data collection was conducted in the Department of Agri-Food Science and Technology of a huge university in northern Italy. This department currently includes eight bachelor's degree programmes and six master's degree programmes. Study participants belonged to seven bachelor's degree courses: Viticulture and Enology; Food Technology; Animal Production; Economics and Marketing in the Agro-Industrial System; Green and Landscape Science and Technology; Land Use and Agroforestry Technology; Agricultural Technology.

Recruitment strategy

Members of the research team and undergraduate mentors presented the general project aimed at degree programme coordinators and students. A properly trained research assistant went to the university classrooms during class hours and, after sharing with participants the purpose of the survey and emphasizing the non-compulsory nature of participation,

has projected a QR code and the related Qualtrics¹ link for direct completion of the survey. The first survey's page summarized basic information about the goals of the project and emphasized the confidentiality of respondents' data and that the data would be analysed in aggregate; participation in this study was voluntary and participants had the option to withdraw from the study at any time. After the presentation, students were invited to voluntarily fill out an online survey.

Participants

A total of 348 s- and third-year students (40.5% male) voluntarily filled out the online questionnaire. The average age of the respondents was 21.13 years ($SD=2.14$). In Table 1 were reported participants' socio-demographic characteristics.

Measures

Identified academic motivation was assessed using the Italian version of the Identified Regulation subscale taken from the Academic Motivation Scale-AMS (Vallerand et al., 1993; It. version: Zurlo et al., 2023). This scale includes four items (e.g., "Because I think that finishing the degree will allow me to work in a field that I enjoy") that correspond to different reasons behind students' decision to apply to university. Each item were rated on a 7-point Likert scale, from 1 (does not match at all) to 7 (matches exactly). The reliability of this scale in the current study was $\alpha=0.82$.

Effort regulation was assessed using one of the subscale of the Motivated Strategies for Learning Questionnaire-MSLQ (effort regulation; Pintrich et al., 1993). A typical translation-back-translation procedure was performed to translate items from English to Italian, and two items were marginally modified to be valid for the entire course syllabus, rather than to a specific course. The scale consisted of four items with a Likert scale from 1 (does not match at all) to 7 (matches exactly). The internal consistency of the scale was $\alpha=0.70$.

Confidence in career planning was measured using four items taken from the Italian version of the Career Decision Self-Efficacy Scale-Short Form (CDSES-SF; Italian version: Nota et al., 2008). We decided to use the Planning subscale, which measures perceived competence in planning the steps necessary to carry out an educational or professional project, through a response scale that ranged from 1 (I am not confident) to 5 (I am fully confident). One item of the original version of the scale was removed because it was considered not applicable to the objective of the study (identify employers, companies, institutions important for

Table 1 Sociodemographic data of the sample

	<i>M (SD)</i>	<i>N (%)</i>	<i>Ranges</i>
Age	21.13 (2.14)		19–57
Gender			
Male		141 (40.5)	
Female		103 (29.6)	
Other		104 (29.9)	
Year			
Second		172 (49.4)	
Third		176 (50.6)	
Course			
Viticulture and Enology		25 (7.2)	
Food Technology		66 (19.0)	
Animal Production		50 (14.4)	
Economics and Marketing in the Agro-Industrial System		70(20.1)	
Ornamental Green and Landscape Protection		33 (9.5)	
Land and Agro-Forestry Technology		18 (5.1)	
Agricultural Technology		86 (24.7)	

¹ www.qualtrics.com.

your possible professional employment). The reliability of this scale was found to be $\alpha = .77$.

Academic achievement (student's GPA and exams passed) Objective data on students' GPAs and the number of exams passed were.

provided by the university's administrative staff. According to the Italian academic system, grades are expressed on a 30/30 basis, and the minimum grade required to achieve proficiency is 18 out of 30.

Data analysis

Data were checked for outliers, multicollinearity, and normality distribution using SPSS 28. To test our model, the Mplus 8 software (Muthen & Muthen, 2017) was employed to estimate a structural equation model (SEM). Using the maximum likelihood (ML) methodology, we first performed confirmatory factor analysis (CFA). Next, we tested our direct and indirect effects hypothesis.

Results

Descriptive statistics

Since the lowest tolerance statistic of 0.79 and the greatest variance inflation factor of 1.27 were both well below the suggested cut-off of 10, there was no evidence of multicollinearity. Skewness levels (ranging from 0.32 to -0.85) and kurtosis values (ranging from 0.52 to -0.62) were acceptable. In Table 2 we reported means and standard deviations, as well as correlations between the study variables. All significant relationships among variables were in the expected direction. Furthermore, as indicated along the table diagonal, all scales reported an internal consistency value (Cronbach's alpha) exceeding the criterion of 0.65 (DeVellis, & Thorpe, 2021).

Confirmatory factor analysis (CFA) and control of common method bias

We used the maximum likelihood method in a CFA to assess the structural validity of our measures. To evaluate

the goodness of fit of the CFA and successive model, the following indices and cut-off criteria were considered (Byrne, 2001): the RMSEA (values between 0.08 and 0.05 suggest an appropriate fit of the model); the SRMR (values below 0.08 are considered a good fit); the CFI, (values above 0.90 are indicative of a reasonably good model fit) and the TLI; (Tucker–Lewis Index; values between 0.90 and 0.95 are indicative of an acceptable fit).

The CFA findings (see Table 3) demonstrated that the five-factor model, including identified motivation, effort regulation, confidence in career planning, number of exams passed and GPA, indicated the best fit to our data when compared to competitive solutions ($\chi^2(67) = 159.06$, $p = .000$, RMSEA = 0.04, SRMR = 0.05; CFI = 0.93; TLI = 0.90). This result confirms that the measures used in the current study have discriminant validity. In line with modification indices suggested by MPlus for increasing the fit indices of the final model, the change indices were inspected. Thus, the model fit was increased by correlating the error terms of two items of the Identified Motivation Scale (“Because I think that finishing the course of study will allow me to work in a field I like” and “Because I think that finishing the course of study will help me to better choose the profession I would like to do”) and four items from the Career Planning Scale (“Make a plan to achieve your goals for the next five years” and “Identify the necessary steps to successfully complete your chosen education”; “Properly prepare a CV” and “Successfully handle a job interview”): $\chi^2(64) = 110.14$, $p = .000$, RMSEA = 0.03, SRMR = 0.04, CFI = 0.96, TLI = 0.95.

Direct effects

Direct effects are reported in Table 4. GPA reported a non-significant association with the course year. On the contrary, the course year is associated with the number of exams passed ($\beta = 0.69$, $SE = 1.37$, $p = .000$). Regarding H1a and H1b, identified motivation showed a non-significant association with GPA ($\beta = -0.05$, $SE = 0.16$, $p = .671$) and exams passed ($\beta = -0.30$, $SE = 0.25$, $p = .345$). Concerning H1c and H1d, identified motivation did show a significant association respectively with confidence in career planning ($\beta = -0.43$, $SE = 0.06$, $p = .000$) and with effort regulation

Table 2 Means, Standard Deviation, Cronbach's Alphas (in brackets), and Correlations among the study variables ($N = 348$). Note. *SD* = Standard Deviation; *Sca* ** $p < .01$

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Age	21.13	2.14	-					
2. Number of exams	8.52	4.54		-				
3. GPA	25.89	2.16	-0.01	0.35**				
4. Identified Academic Motivation	23.36	3.69	-0.07	-0.02	0.08	(0.79)		
5. Confidence in career planning	3.66	0.74	0.07	-0.02	-0.03	0.31**	(0.81)	
6. Effort Regulation	5.04	1.15	0.03	0.29**	0.42**	0.30**	0.27**	(0.71)

Table 3 Fit indices for the five-factor model and the alternative models

Model	χ^2	df	p	RMSEA	SRMR	CFI	TLI
One-factor model ^a	667.534	77	0.000	0.10	0.12	0.52	0.44
Two-factor model ^b	501.156	76	0.000	0.08	0.12	0.66	0.59
Three-factor model ^c	298.043	73	0.000	0.06	0.10	0.81	0.79
Four-factor model ^d	161.162	71	0.000	0.04	0.93	0.91	0.05
Five-factor model ^e	159.057	67	0.000	0.04	0.93	0.90	0.05
Five-factor model^f	110.137	64	0.000	0.03	0.04	0.96	0.95

Note. *df*=degree of freedom; RMSEA=Root Mean Square Error of Approximation; SRMR=Standardized Root Mean Square Residuals; CFI=Comparative Fit Index; TLI=Tucker-Lewis Index. In bold the selected model

^a All indicators load on a single factor

^b identified motivation and effort regulation; career planning, GPA and number of exams passed load on a second factor

^c identified motivation; effort regulation; career planning, GPA and number of exams passed

^d identified motivation; effort regulation; career planning; GPA and number of exams passed

^e identified motivation; effort regulation; career planning; GPA; number of exams passed

^f identified motivation; effort regulation; career planning; GPA; number of exams passed; three pair of items errors correlated: mot1 with mot3; plan1 with plan3; plan4 with plan7

Table 4 Standardized direct and indirect effects for mediation models

Standardized direct and indirect effects	Estimate	SE	95% CI
<i>Effects-Model 1</i>			
Year of study → Exams passed	0.69***	1.37	[5.21, 6.34]
Year of study → GPA	0.04	0.07	[-0.40, 0.19]
Identified Motivation → Number of exams	-0.30	0.25	[-0.73, 0.17]
Confidence in career planning → Number of exams	-0.10	0.42	[-1.34, 0.38]
Effort Regulation → Number of Exams	0.38***	0.11	[1.51, 2.48]
Identified Motivation → GPA	-0.05	0.16	[0.16, 0.26]
Confidence in career planning → GPA	-0.24**	0.33	[-1.49, -0.20]
Effort regulation → GPA	0.62***	0.34	[1.04, 2.05]
Identified Motivation → Confidence in career planning	0.43***	0.06	[0.19, 0.40]
Identified Motivation → Effort regulation	0.22**	0.09	[0.05, 0.37]
Confidence in career planning → Effort regulation	0.34**	0.02	[0.22, 0.78]
Identified Motivation → Confidence in career planning → Effort regulation → Number of exams	0.10**	0.02	[0.01, 0.09]
Identified Motivation → Confidence in career planning → Effort regulation → GPA	0.10**	0.03	[0.03, 0.15]
Total effects (DV= average votes)	0.123*	0.03	[0.01, 0.22]
Total effects (DV= exams passed)	0.107**	0.03	[0.04, 0.17]

Note. ***p* < .01; ****p* < .001; S.E. = Standard Errors; 95% CI=bootstrapping lower and upper limit bias-corrected 95% confidence intervals

($\beta = 0.22$, $SE = 0.09$, $p = .014$). Therefore, our first hypotheses were partially supported. Regarding our second hypothesis, effort regulation showed a significant positive association with GPA (H2a; $\beta = 0.62$, $SE = 0.26$, $p = .000$) and with the number of exams passed (H2b; $\beta = 0.38$, $SE = 0.34$, $p = .000$). Regarding confidence on career planning, our results underlined a significant and negative association with the GPA (H3a; $\beta = -0.25$, $SE = 0.33$, $p = .015$) and a non-significant direct effect on exams passed (H3b; $\beta = -0.10$, $SE = 0.42$, $p = .254$). Finally, regarding H4, the obtained results indicate a direct significant association between career planning and learning effort management ($\beta = 0.34$, $SE = 0.02$, $p = .003$). Therefore, our direct effects hypotheses are partially supported.

Mediation analysis

With regard to the hypothesized serial mediations, the relationship between identified motivation and GPA, via confidence in career planning and learning effort regulation, was significant (H5; $\beta = 0.10$, $SE = 0.03$, $p = .006$, 95%CI [0.09, 0.35]) as well as the relationship between identified motivation and exams passed through the serial mediation of confidence in career planning and learning effort regulation (H6; $\beta = 0.10$, $SE = 0.02$, $p = .009$, 95%CI [0.10, 0.43]). Therefore, our mediation hypotheses are supported.

Discussion

In accordance with the well-established theoretical framework provided by self-determination theory (Deci & Ryan, 1985), the purpose of the present study was to explore antecedents that may be associated with students' academic achievement, in terms of GPA and the number of exams

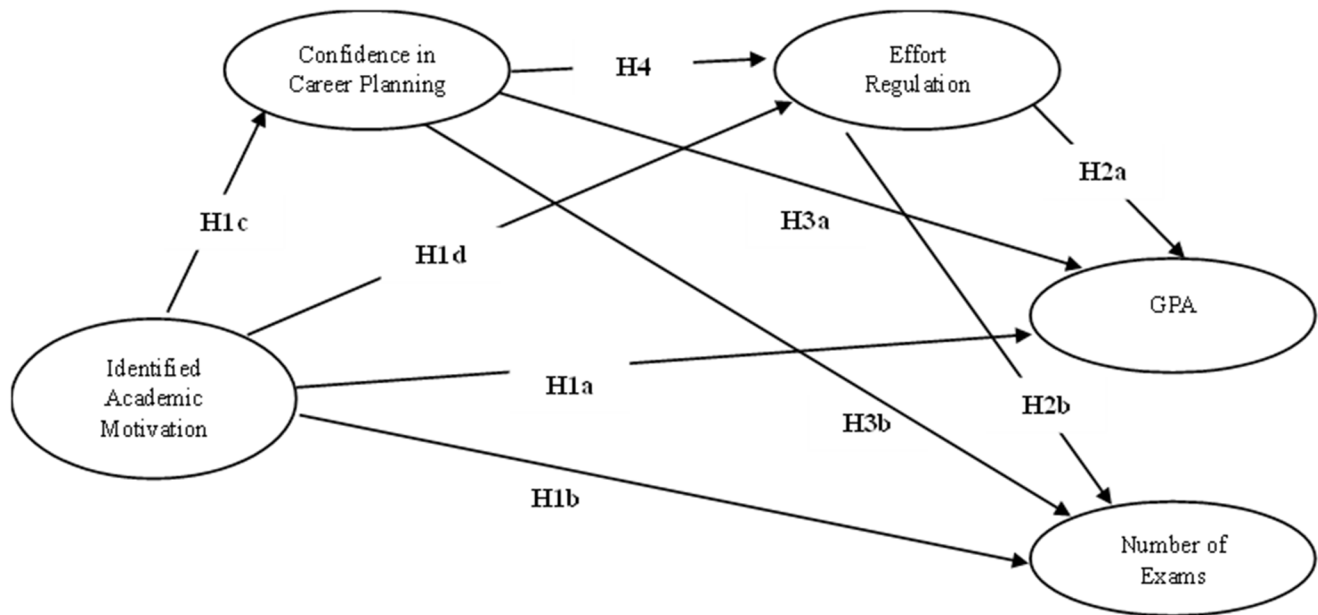


Fig. 1. Hypothesized serial mediation model Indirect effects:

H5: Identified Academic Motivation > Confidence in Career Planning > Effort Regulation > GPA.

passed. Specifically, the findings of the current study help to delve further into the role of personal resources and identified academic motivation for promoting the academic success of university students.

Regarding our first hypothesis, we did not confirm the direct effect of identified motivation on academic achievement. Specifically, we did not find a direct association between motivation and GPA (H1a) and the number of exams passed (H1b). These findings are not in line with the previous literature. However, the present study represents preliminary evidence that there is an indirect relationship between identified motivation and academic achievement, mediated by other variables.

On the other hand, in line with previous studies, the current results indicate a positive direct association between identified motivation and confidence in career planning (H1c) and learning effort regulation (H1d). In other words, students who decide to enrol at university because they are driven by professional goals also perceive themselves as more confident in their career planning and more able to regulate their effort in learning. This finding aligns with previous evidence suggesting that being prompted to invest in studying specifically by work-related goals could lead to developing a more positive view of one's future and, as a result, having greater confidence in one's ability to plan a career path (Sung et al., 2013). Similarly, individuals characterized by instrumental motivation to achieve a goal- in this case a career - develop better abilities to manage and regulate one's learning-related efforts, with more judicious expenditure of energy during their time at college

H6: Identified Academic Motivation > Confidence in Career Planning > Effort Regulation > Number of Exams.

(Schneider & Preckel, 2017). With respect to the latter variable, we confirmed our second hypothesis: in fact, we confirmed the association between learning effort regulation and GPA (H2a) and the number of exams passed (H2b). These results are in line with previous studies (Kizilcec et al., 2017; Schneider & Preckel, 2017). In a nutshell, the better students can manage their efforts and energies toward the goal, the higher their academic achievement.

With respect to our third hypothesis, regarding confidence in career planning, surprisingly we found results that were completely opposite to those indicated by the literature. In fact, we found a negative and significant effect on GPA (H3a), and we did not find an association with the number of exams passed (H3b). Therefore, it appears that students who show greater confidence in career planning have lower GPAs. One possible explanation for this result is that the more confident students are about entering the world of work, the more they are driven to accept any grade in order to finish the course sooner. Furthermore, it is possible that students who are more inclined to enter the world of work will occupy their time by participating in various extra-university activities that could enrich their CV (e.g., volunteering, internships, work placements) and conceive this to be a priority, rather than taking all exams quickly and with high grades.

Finally, the direct association between confidence in career planning and learning effort regulation was supported by current results. Our findings are in line with previous studies suggesting that college university students who are more convincing and focused on their professional

aspirations are better able to self-regulate their learning and focus their efforts during the educational process. These students try to evaluate, track and modify their learning procedures in their efforts to achieve fruitful results (Beishuizen & Steffens, 2011).

Regarding our indirect hypotheses, we confirm the association between both identified motivation and academic achievement, respectively GPA (H5) and the number of exams passed (H6) confirm the association between identified motivation and academic achievement, respectively GPA (H5) and the number of exams passed (H6), via the serial mediation of confidence in career planning and learning effort regulation. Although, to the best of our knowledge, this is only the beginning of an investigation into this relationship, the findings can be explained using the literature that is now in existence. As previously mentioned, several studies had emphasized the association of identified motivation with academic achievement (Ramos Salazar & Meador, 2023) although the full understanding of the underlying mechanism is far from being achieved. According to our results, the association between motivation and GPA and the number of passed exams is significant and positive when the relationship is boosted by great levels of confidence in career planning and learning effort management. When students with identified motivation believe that attending college is beneficial and functional for their careers (e.g., it enables them to work in the sector of their interest), they also report greater confidence in their capacity to make plans for the future of their careers. As a result, university students exhibiting a high ability to balance their efforts also optimize the learning process, maximize energy, develop meaningful learning and achieve higher academic success in terms of GPA and the number of exams passed.

Theoretical and practical implications

From a theoretical perspective, the research findings overcome the limitations of previous research in several ways. First, this study is the combination of subjective data as predictors (self-reported measures) and objective data as outcome (GPA and number of exams passed), in line with suggestions of previous research that has emphasized the value of using objective data to understand which variables actually affect academic outcomes more realistically, as self-reported measures are not always reliable (Caskie et al., 2014).

Secondly, most published studies using the theoretical framework of SDT (Ryan & Deci, 2000) concern the investigation of the effects of motivation quality on indicators of academic success in the primary or secondary school context, whereas our study is specific to the university environment. Moreover, most research on study motivation has

focused on strengthening evidence regarding the positive effects of intrinsic motivation, such as building meaningful and lasting learning (e.g., Diaconu-Gherasim et al., 2020; Liu, 2021). Rather, at university, it might be more important to develop an identified motivation, both to achieve better academic results as well as to decrease intentions to drop out of studies, as evidenced by experimental (e.g., Burton et al., 2006), longitudinal (e.g., Liu et al., 2019) and meta-analysis (e.g., Howard et al., 2021) research. In fact, especially in European universities, it is quite common that during their academic studies, students have to deal with courses included as compulsory subjects that are not necessarily in line with their educational interests. In this regard, students who develop an identified motivation recognize the instrumental value of that action, identifying with it and this allows them to persevere even when confronted with content that is not entirely appealing to them but that they recognize as useful for the professional goal they wish to achieve after graduation.

The fact that students' personal characteristics/resources and career strategies have been linked can be considered an innovative aspect of the current study: to our knowledge, no other research has explored the link between identified motivation, confidence in career planning, and self-regulated learning strategies at the same time. The current study examines the process that leads students with identified motivation to achieve better academic results (in terms of GPA and the number of exams), looking for the presence of some elements that mediate this relationship, as suggested previous research (e.g., Burton et al., 2006). So far, it has not been determined which precise behaviours and personal resources are brought into play by the student when internalizing the significance of a goal, but this study may improve understanding in this respect. Indeed, having an identified motivation helps the student to create mental planning scripts on how to pursue his or her goals (both academic and professional) and to implement self-regulating effort behaviours to achieve them.

A significant and long-term objective, such as completing a degree, necessitates a commitment to learn new activities, build and enhance skills, and sustain a constant effort. As a result, developing identification with a goal and adopting a mindset that allows for the overcoming of challenges can be a fundamental challenge in pursuing it (Burton et al., 2006; Howard et al., 2021).

From a practical point of view, this study can provide guidance for the design of orientation and personal resource promotion interventions that can serve to encourage students' academic career completion. Other studies have demonstrated the usefulness of vocational motivation and self-efficacy training programs (lectures, tutorials, face-to-face meetings) aimed at improving university students'

personal and career results (e.g., Foulstone & Kelly, 2019). The last point appears to be particularly pertinent, especially when considering the social and economic costs associated with high university dropout rates.

Limitations and future directions

In addition to its strengths, such as the use of objective data, this research also has some limitations. Firstly, the research adopted a cross-sectional design, which allows us to analyse only associations between variables. Future research could examine the long-term mediating impacts of confidence in career planning and effort regulation, in order to identify cause-effect relationships between constructs. Secondly, the research involved students from only one department of an Italian university, so the results cannot be generalised to the entire university population. In fact, we have no way of verifying in an absolute sense that the results of our study are applicable to all university contexts. Although the performance indicators we have included (GPA and number of exams passed) are the same as those used in other research in other countries (e.g., Greco et al., 2022), the number of exams included in the university curriculum may vary considerably from institution to institution. This aspect may make it difficult to implement the study from a cross-cultural perspective and for this reason the results obtained should be interpreted in the light of the specificity of the context in which they could be applied.

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Data Availability The corresponding author can provide the data sets generated and/or analyzed during the current research upon a reasonable request.

Declarations

Ethical approval All procedures executed in this research involving human participants were under the institutional and national research committee ethical standards and with the 1964 Declaration of Helsinki (as revised in 2000) and its later modification or comparable ethical standards.

Informed consent All subjects participated voluntarily and signed informed consent.

Conflict of interest No conflicts of interest are disclosed by the authors. The authors take sole accountability for the content and composition of this paper.

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