

Analysing the Genesis of Entrepreneurial Intentions for Early Adolescents*

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Abstract

The study examines the relationships between attitude towards entrepreneurship, entrepreneurship competence, and entrepreneurial self-efficacy in the formation of entrepreneurial intentions among early adolescents participating in entrepreneurship education programs. A theoretical model based on the Theory of planned behaviour was empirically tested using data from a weekend entrepreneurship education program across 13 primary schools. The findings support the proposed model, revealing that entrepreneurship competence positively influences intentions, mediated by attitude and moderated by self-efficacy. The observations offer new insights into applying the Theory of planned behaviour in entrepreneurship education for early adolescents and practical recommendations for educators on key focus areas.

Keywords: Entrepreneurial intentions, Theory of planned behaviour, entrepreneurship education program, primary school, moderated mediation.

JEL Codes: A21, L26, I21

1. Introduction

Learning outcomes of entrepreneurship education (EE) programs are a widely researched phenomenon as they are viewed as a path towards solving many of today's and future societies (Aamir et al., 2019). Entrepreneurial intentions are among the most studied entrepreneurial learning outcomes in EE programs as researchers wish to determine whether the participants plan to embark on a path of entrepreneurial behaviour. Similarly, Ajzen's (1991) Theory of planned behaviour (TPB) is one of the most widely used intention theories to explain the formation of entrepreneurial intentions (Aamir et al., 2019; Galvao et al., 2018). The process of entrepreneurial intention formation as an outcome of EE

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programs is typically studied at the university level due to the proximity of the beginning of the student's career, potentially of self-employment (Boubker et al., 2021). Furthermore, at all levels of education, EE programs have been demonstrated to yield a positive development of entrepreneurial learning outcomes (Aamir et al., 2019; Brüne & Lutz, 2020).

However, several researchers point out that early adolescence is the optimal time to start building entrepreneurship competence, attitude towards entrepreneurship, and entrepreneurial self-efficacy (Huber et al., 2014; Rosário et al., 2014). Moreover, early adolescents, thus pupils 10–14 years of age, already have career aspirations (Archer et al., 2014; Lazarides et al., 2020). This age, therefore, can also be seen as essential for developing the pupils' entrepreneurial intentions, which are substantial predictors of future entrepreneurial behaviour and, consequently, careers (Ajzen, 1991). As early adolescents are at a different emotional and cognitive developmental stage than their older peers, research into entrepreneurial intention formation in late adolescents or adults cannot be freely applied to early adolescents (Aamir et al., 2019; Galvao et al., 2018).

The present study thus investigates how entrepreneurial intentions form in early adolescents and what role other entrepreneurial learning outcomes play in shaping entrepreneurial intentions. The contribution of the present study is twofold. Firstly, it investigates the formation of entrepreneurial intentions in early adolescents. Thus, the study contributes to the knowledge of the psychological process of intention formation in early adolescents with budding career aspirations (Archer et al., 2014; Lazarides et al., 2020). Second, utilising TPB to conceptualise a theoretical entrepreneurial intention model for early adolescents and empirically testing it contributes to a broader understanding of TPB. The study also proposes a novel way in which the antecedents in the model interact with intentions and each other.

2. Literature review and hypotheses development

2.1 Theory of planned behaviour and entrepreneurial intentions

Entrepreneurial intentions are generally defined as a self-perceived belief of an individual in the likelihood that they will become entrepreneurs in the future or even as the first step towards becoming an entrepreneur (Krueger et al., 2000; Liñán & Chen, 2009). While this description of entrepreneurial intentions may seem more applicable to university and secondary school students closer to beginning their careers, early adolescents are already starting to shape their career aspirations (Archer et al., 2014; Lazarides et al., 2020). Exposing early adolescents to the dynamic environment of startup weekends may foster entrepreneurial intentions, potentially increasing their propensity towards pursuing self-employment as a viable career path (Ashby & Schoon, 2010), which is one of the aims of the given EE programs (SPIRIT Slovenija, 2019). Entrepreneurial

intentions as an outcome of EE programs usually develop in unison with or as a consequence of other entrepreneurial learning outcomes. Amongst the theoretical models that describe the formation of entrepreneurial intentions and thus predict future entrepreneurial behaviour of individuals, Ajzen's (1991) TPB is the most widely used. According to TPB, intentions are the best predictors of an individual's future behaviour (Ajzen, 1991). In entrepreneurship, many authors have used the theoretical model where three antecedents precede entrepreneurial intentions, the attitude towards entrepreneurship of the individual and the people around them, and subjective norms (Aamir et al., 2019; Boubker et al., 2021). Some researchers have also added entrepreneurship competence as one of the antecedents (Liñán & Chen, 2009).

TPB is often employed to describe how entrepreneurial intentions form with university and secondary EE programs. Also, attitude towards entrepreneurship and entrepreneurial self-efficacy have consistently been demonstrated as antecedents of entrepreneurial intentions (Aamir et al., 2019; Galvao et al., 2018). In primary school EE programs, where entrepreneurship competence is considered to be the most desired learning outcome of the participants because it is believed to improve an individual's social and economic welfare later in life (Cunha & Heckman, 2008; Huber et al., 2014), the process of entrepreneurial intention formation is not the focus of to-date research (Huber et al., 2014). However, entrepreneurial intentions can develop from EE programs in early adolescence as collaborative activities, idea generation and sharing, and other entrepreneurial exercises influence participants' perceptions of and aspirations towards entrepreneurship as a career path. For instance, when early adolescents engage in sandbox entrepreneurship activities like business modelling or prototyping, they gain practical experience with entrepreneurial processes, potentially increasing their interest in entrepreneurial careers (Garcia-Rodriguez et al., 2019; Jardim et al., 2023). Also, early adolescents have often demonstrated improved entrepreneurship competence, entrepreneurial self-efficacy, and attitude towards entrepreneurship due to EE programs (Huber et al., 2014).

2.2 Entrepreneurship Education Programs

Programs for entrepreneurship education worldwide have demonstrated a positive impact on the development of entrepreneurship competence, attitude towards entrepreneurship, entrepreneurial self-efficacy, entrepreneurial intentions themselves (Galvao et al., 2018), and on a higher probability of new resulting businesses (DeGeorge & Fayolle, 2008; Elert et al., 2015). Research also demonstrates that competence is best fostered in early adolescence or sooner, and early adolescents are the most apt population for entrepreneurial learning and benefit most from EE programs. This age group is more closely connected with their peers and teachers, making mentored teamwork more enjoyable for

them than their older counterparts (Clark-Lempers et al., 1991; Ratelle et al., 2023). Also, entrepreneurship competence acquired early is believed to foster an individual's welfare in adulthood (Cunha & Heckman, 2008; Garcia-Rodriguez et al., 2019).

For instance, Huber et al. (2014) studied the *BizWorld* EE program with early adolescents. The study measured the potential increase of different dimensions of entrepreneurship competence, entrepreneurial self-efficacy, and entrepreneurial intentions and demonstrated that all but one measured dimension of entrepreneurship competence had increased, as had entrepreneurial self-efficacy. Entrepreneurial intentions, however, had decreased (Huber et al., 2014).

Analogously, Garcia-Rodriguez et al. (2019) described the success of the Spanish *Enterprise in School* EE program studied with early adolescents. In this EE program, similar to *YESS!* and *BizWorld*, pupils founded and ran a company that produced and sold products to schoolmates at a school fair. The study found that the EE program had fostered specific constructs of entrepreneurial learning, such as attitude towards entrepreneurship, entrepreneurial intention, and some dimensions of entrepreneurship competence (Garcia-Rodriguez et al., 2019). The EE program examples work to demonstrate that such school initiatives for early adolescents do, in fact, foster measurable entrepreneurial learning outcomes.

Other EE programs, such as the startup weekend program, only last a few days and are designed to help participants go from idea through team formation, market research, prototyping, and business modelling to the conception of actual startups. Startup weekends are 3-day (Sargent et al., 2021) or 2-day (Thompson & Illes, 2021) events focusing on the startup stage of a firm or the opportunity identification stage, where uncertainty is high, and there is much stress involved (Sargent et al., 2021). While startup weekends are primarily organised for adult entrepreneurs or students (Krueger, 2014; Thompson & Illes, 2021), it is also suitable for early adolescents who are more prone to view stressful situations, a frequent phenomenon at startup weekends, as an adventure than their older counterparts (Stepánková et al., 2023).

Entrepreneurial intentions, conceptualised as an individual's self-perceived probability of pursuing entrepreneurship, are increasingly recognised as relevant for early adolescents' career path development. Exposure to entrepreneurial environments, such as startup weekends, may catalyse these intentions. TPB provides a theoretical framework for understanding the process of entrepreneurial intention formation, encompassing attitude towards entrepreneurship, entrepreneurial self-efficacy, and entrepreneurship competence as its antecedents. While predominantly applied in tertiary education, research demonstrates that entrepreneurial intentions can be fostered through EE programs promoting collaborative work and practical experience in early adolescence. Empirical evi-

dence from diverse EE programs worldwide demonstrates positive outcomes in entrepreneurship competence, attitude towards entrepreneurship, entrepreneurial self-efficacy, and entrepreneurial intentions. Notably, early adolescence is a critical developmental period for entrepreneurial learning.

2.3 Hypothesis development

2.3.1 Entrepreneurship Competence

Competence represents the amalgam of the knowledge, skills, and attitude needed to accomplish a specific task (Baartman & de Bruijn, 2011). Entrepreneurship competence is often included in various TPB-based intention models in university and secondary-school level EE research with a significant direct or indirect impact on intention formation (Fayolle & Gailly, 2015; Rosique-Blasco et al., 2018). Likewise, An individual's mastery of entrepreneurship competence influences the individual's attitude towards entrepreneurship deeply (Fayolle & Gailly, 2015; Liñán, 2008).

However, early adolescents may face more significant challenges in developing entrepreneurship competence compared to older individuals due to their ongoing emotional and cognitive development and relatively limited life experiences (Sagone et al., 2020; Spiekerman & Rose, 2024; Stepánková et al., 2023). Consequently, lower perceived competence may lead to lower levels of satisfaction with the results of their work, possibly directly affecting entrepreneurial self-efficacy, attitude towards entrepreneurship, and entrepreneurial intentions (Ratelle et al., 2023).

While the process of entrepreneurial intention formation with all antecedents has not yet been researched for early adolescents, nor has a theoretical model of entrepreneurial intentions been proposed for this age group, some studies did contemporaneously measure entrepreneurship competence, attitude towards entrepreneurship, and entrepreneurial intentions. For instance, Barba-Sánchez and Atienza-Sahuquillo (2016) longitudinally studied the entrepreneurial learning outcomes of a three-term EE program with early adolescents in rural Spain. The EE program, explicitly designed to help promote entrepreneurship in a country suffering from unemployment, was carried out in the Rural Schools Grouped Together (*Colegio Rural Agrupado*). The participants founded a company and designed all the accompanying materials like the company name and logo, determined the needed startup capital, designed and manufactured products, and finally marketed and sold them in a real-life market. The study found that the pupils' entrepreneurship competence, attitude towards entrepreneurship, and entrepreneurial intentions had improved during the EE program. However, what separated this age group from their older counterparts, the researchers observed, was that the early adolescents' primary motivation was not money-making but rather doing something they liked.

Similarly, Tsakiridou and Stergiou (2014), in a study of an EE program in Western Macedonia, Greece, demonstrated that the participating pupils' entrepreneurship competence and entrepreneurial intentions had improved. Finally, in the Mexican *My First Company* EE program with 11–12-year-olds, Cárcamo-Solís et al. (2017) found that the pupils had developed both their entrepreneurship competence and attitude towards entrepreneurship. The EE program, where participants, as opposed to older participants of EE programs, mainly learned through playful activities, helped the pupils improve entrepreneurship competence and attitude towards entrepreneurship. We can thus set the following hypotheses.

Hypothesis 1: Entrepreneurship competence will be directly and positively related to entrepreneurial intentions for early adolescents participating in the EE program.

Hypothesis 2: Entrepreneurship competence will be directly and positively related to the attitude towards entrepreneurship of early adolescents participating in the EE program.

2.3.2 Attitude towards entrepreneurship

Goel et al. (2007) define attitude towards entrepreneurship as a construct where the individual's attitude towards entrepreneurship and entrepreneurs coalesce. Studies demonstrate that attitude towards entrepreneurship significantly impacts an individual's entrepreneurial intentions, thus making a future entrepreneurial career appear more attractive and desirable (Ajzen, 1991; Liñán, 2008).

While infrequently, some primary school EE program studies measure attitude towards entrepreneurship and entrepreneurial intentions. For instance, when Garcia-Rodriguez et al. (2019) investigated the impact of their Spanish primary school EE program on attitude towards entrepreneurship and entrepreneurial intentions, they discovered that the two constructs indeed improve. Also, in the study of the *Rural Schools Grouped Together* EE program in Spain by Barba-Sánchez and Atienza-Sahuquillo (2016), the pupils' attitude towards entrepreneurship developed in the sense that they changed their minds about who an entrepreneur was in the sense that they were not merely boss but rather someone who worked hard and took risks to make or lose money. Also, their entrepreneurial intentions changed such that they did not feel averse to the idea of starting a firm in their adulthood. In both the mentioned cases, the pupils stated that they enjoyed getting the job done and working with teammates most and that their prime motivation is the fun of such work, not the financial benefits. This conclusion, which aligns with studies demonstrating that early adolescents have stronger connections to their friends than in later years (Clark-Lempers

et al., 1991; Spiekerman & Rose, 2024), differentiates them from secondary or tertiary education students. Therefore, the following hypothesis can be posited:

Hypothesis 3: Attitude towards entrepreneurship will be directly and positively related to entrepreneurial intentions for early adolescents participating in the EE program.

We also argue that attitude towards entrepreneurship mediates the relationship between entrepreneurship competence and entrepreneurial intentions. In the proposed theoretical model of entrepreneurial intentions, entrepreneurship competence is hypothesised to influence attitude towards entrepreneurship, which in turn predicts entrepreneurial intentions (Liñán, 2008; Liñán & Chen, 2009). This reasoning leads to the following hypothesis:

Hypothesis 4: Attitude towards entrepreneurship will mediate the relationship between entrepreneurship competence and entrepreneurial intentions.

2.3.3 Entrepreneurial self-efficacy

In entrepreneurship, entrepreneurial self-efficacy constitutes an individual's self-perceived capacity to start and run a business successfully (Galvao et al., 2018). For Boyd and Vozikis (1994), entrepreneurial self-efficacy defines how an individual judges internal and external obstacles to success in an entrepreneurial activity. Entrepreneurial self-efficacy can be viewed as a task-specific construct necessary for forming entrepreneurial intentions. Thus, developing entrepreneurial self-efficacy alongside or before entrepreneurial intentions is crucial in early adolescents as they shape their career aspirations (Archer et al., 2014; Lazarides et al., 2020).

While recognised as an antecedent of entrepreneurial intentions in TPB, pupils' entrepreneurial self-efficacy strengthens the positive relationship between entrepreneurship competence and attitude towards entrepreneurship for pupils participating in EE programs. Specifically, entrepreneurial self-efficacy will enhance positive attitudes towards entrepreneurship through beliefs in one's capabilities of successfully performing entrepreneurial tasks during an EE program (Boyd & Vozikis, 1994). Higher entrepreneurial self-efficacy means reinforcing a person's belief that they can perform a specific activity successfully, especially in combination with entrepreneurship competence. Entrepreneurial self-efficacy will allow the early adolescent to assess their entrepreneurship competence higher, which will usher in a positive attitude towards entrepreneurship. Therefore, it can be conjectured that entrepreneurial self-efficacy would moderate the impact entrepreneurship competence has on attitude towards entrepreneurship (Pham et al., 2023).

Some studies of primary school EE programs show that the three constructs are measured contemporaneously. For instance, Cárcamo-Solís et al. (2017), in their research on the rural primary school EE program, determined that not only were entrepreneurship competence and attitude towards entrepreneurship impacted positively, but so was entrepreneurial self-efficacy developed with the other two constructs. Also, Tsakiridou and Stergiou (2014) demonstrated that the development of entrepreneurship competence, attitude towards entrepreneurship, and entrepreneurial self-efficacy are connected. Namely, specific dimensions of entrepreneurship competence increased with entrepreneurial self-efficacy, attitude towards entrepreneurship, and entrepreneurial intentions.

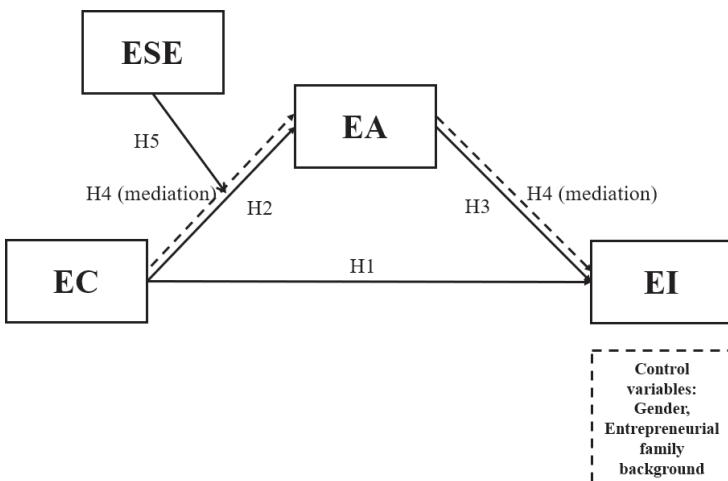
Thus, the following hypothesis can be set:

Hypothesis 5: Entrepreneurial self-efficacy will moderate the relationship between entrepreneurship competence and attitude towards entrepreneurship for pupils participating in the EE program.

2.3.4 Proposed entrepreneurial intentions model

The entrepreneurial intention model that we propose is based on Ajzen's (1991) TPB model but with some adaptations. It is a moderated mediation where entrepreneurial intention (EI) is the dependent variable, entrepreneurship competence (EC) is the independent variable, and attitude towards entrepreneurship (EA) is the mediator. Entrepreneurial self-efficacy (ESE) moderates the relationship between entrepreneurship competence and attitude towards entrepreneurship. Gender and entrepreneurial family background are control variables. The theoretical model is presented in Figure 1.

Figure 1: Proposed Entrepreneurial Intention Model based on Ajzen's TPB



3. Methods

3.1 Research setting

Data were collected at the end of the startup weekend EE program organised within the Slovenian *Creativity, Entrepreneurship, and Innovation* project to improve pupils' entrepreneurship competence, entrepreneurial self-efficacy, and attitude towards entrepreneurship through developing their business ideas. The project also sought to heighten the participants' entrepreneurial intentions by showing entrepreneurship as a possible career choice (SPIRIT Slovenija, 2019).

The studied EE program was a startup weekend event organised for early adolescents. On Friday at noon, pupil teams identified authentic problems that specific groups of people faced. The pupils first participated in a market research workshop, then, with the help of teachers and an outside expert, researched the problem by surveying potential customers and prototyped solutions to the problem that customers would be willing to buy. On Friday evening or Saturday morning, pupils tested the prototypes with potential customers and started collecting their emails for later marketing use. Saturday morning was reserved for the business modelling workshop, allowing pupils to define marketing and sales channels and lay out a financial plan. Finally, on Saturday afternoon, the pupils participated in a pitching workshop, where they learned to pitch their ideas effectively. At the end of the startup weekend on Saturday evening, teams pitched their business models to a panel of entrepreneurs, after which the judges declared the best three teams in terms of most excellent progress. Pupils did much of the work in the city centre, where they interviewed their prospective customers to understand the problem and test the prototypes.

Four outside experts who were trained to work for startup incubators or were startup founders (SPIRIT Slovenija, 2019) and school teachers, who also provided constant assistance to the teams, facilitated the startup weekend EE programs. The teachers had varying levels of experience and training but had all undergone mandatory 16-hour training for entrepreneurship educators (SPIRIT Slovenija, 2017).

3.2 Sample and data collection

In the EE program, 108 pupils aged 9–15 participated; one pupil was nine years old, one was 15, and the rest were 10–14 with an average age of 12.7 years from classes 6–9 from 13 Slovenian primary schools. Most participants, 85, joined the EE program of their own volition. Approximately half had prior experience with EE programs, and about 30 % had plans to attend an entrepreneurship competition four months later. Gender-wise, girls represented 58 % of the participants. In all, 44 % had an entrepreneurial family background. The pupils were sent the

questionnaires in digital form on Saturday evening at the end of the program. Most pupils answered the survey immediately, some a few days later.

3.3 Measures

In our study, we used previously validated measurement scales. The items, translated from English to Slovene using translation-back-translation (Brislin, 1970), were scored on a five-point Likert scale, where 1 = totally disagree and 5 = totally agree. The items featured in the measurement scales are presented in Table 1.

The dependent variable, entrepreneurial intentions, was measured with the following item, adapted from Liñán and Chen (2009): “I might become an entrepreneur someday.”

Entrepreneurship competence was measured with 12 items featuring the first-level competence descriptors from EntreComp. The EntreComp comprises 15 entrepreneurship competence dimensions organised into 3 clusters: *Ideas and Opportunities*, *Resources*, and *Into Action*. Each of the 3 clusters consists of five specific entrepreneurship competence dimensions that fit together according to the knowledge, skills, or attitudes they cover (Bacigalupo et al., 2016). One dimension was taken from each cluster to cover as broad a spectrum of entrepreneurship competence as possible. The 12 items in the questionnaire pertained to the following dimensions: *Spotting opportunities*, *Motivation and perseverance*, and *Working with others*.

The *Spotting opportunities* dimension of entrepreneurship competence is the capacity to spot opportunities for creating value for others that other non-entrepreneurial individuals have missed (Dyer et al., 2008; Morris et al., 2013). *Motivation and perseverance* is the ability to persevere in the face of adverse conditions and setbacks that a prospective entrepreneur might face when developing and executing their business model (Huber et al., 2014; Morris et al., 2013). Finally, working with others is the capacity to interact socially and establish relationships to help the individual develop their entrepreneurship project (Dyer et al., 2008; Morris et al., 2013).

The entrepreneurship competence scales with the initial 55 items that measured the original 15 EntreComp dimensions were tested in a pilot study with 21 pupils. The scales proved to be too extensive, so based on the feedback of the pupils and further statistical operations for determining loadings, cross-loadings, and reliability, the number of dimensions was reduced to the three described above as they had the highest reliabilities in each EntreComp cluster. The reliabilities were tested with Cronbach's alpha (α), which were as follows: *Spotting opportunities* = .89, *Motivation and perseverance* = .88, and *Working with others*

$\alpha = .83$. The value of the α is acceptable for research of this sort (Fayolle & Gailly, 2015).

Further, attitude towards entrepreneurship was measured with a four-item scale, scored on a five-point Likert scale, where 1 = totally disagree and 5 = totally agree. Measurement scales developed by Liñán and Chen (2009) were adapted to suit early adolescents. The reliability of the attitude towards entrepreneurship construct was satisfactory at $\alpha = .83$

Lastly, entrepreneurial self-efficacy was measured by three items taken from the EntreComp first-level descriptors for *Self-awareness and self-efficacy* (Bacigalupo et al., 2016). Although EntreComp includes attitude towards entrepreneurship into its entrepreneurship competence framework, this study sets it as an independent construct as it is such in various intention models (Ajzen, 1991; Krueger et al., 2000; Liñán, 2008). The reliability was satisfactory at $\alpha = .83$. The items featured in the survey can be seen in Table 1.

To determine whether gender and entrepreneurial family background have any statistically significant effect on the relationships between entrepreneurial intentions and its antecedents, two control variables, *Gender* and *Entrepreneurial family background*, were introduced. They were measured as dichotomous variables where *Male* = 1, *Female* = 0, *Entrepreneurial family background* = 1, and *Non-entrepreneurial family background* = 2, respectively.

3.4 Statistical procedures and data analysis

A confirmatory factor analysis was performed on the measurement model, and the goodness of fit indices of comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardised root mean square residual (SRMR) were observed to inspect the validity and reliability of the constructs comprising the theoretical model. The goodness of fit indices of the final measurement model demonstrated good fit with the following values: $\chi^2 = 293.562$, $df = 192$, $CFI = .930$, $p = .000$, $RMSEA = .070$ with the lower end of the 90 % confidence interval at $LO90 = .054$ and the higher end at $HI90 = .086$, and $SRMR = .0601$. The standardised estimates of the measurement model are presented in Table 1.

The confirmatory factor analysis indicated a good fit between the data and the latent and control variables. The items comprising the latent variables were summated for the theoretical model to create composite variables. The composites were also tested in a measurement model that yielded the following fit index values: $\chi^2 = 0.475$, $df = 1$, $CFI = 1.000$, $p = .491$, $RMSEA = .000$ with $LO90 = .000$ and $HI90 = .224$, and $SRMR = .150$.

Lastly, the proposed theoretical model with moderated mediation was analysed and tested. The goodness of fit indices demonstrated good fit with the following

values: $X^2 = 18.043$, $df = 11$, $CFI = .970$, $p = .081$, $RMSEA = .077$ with $LO90 = .000$ and $HI90 = .218$, and $SRMR = .068$. The Hayes method (Hayes, 2013) was then employed to obtain the lower and upper bounds of the confidence interval. The bootstrap method was used with 5000 simulations to test the hypotheses on the model. The goodness of fit indices demonstrated a very good fit. The IBM SPSS 21.0 and IBM AMOS 20.0 statistical software applications were used to perform the statistical analyses.

4. Results

Hypothesis 1 postulated that entrepreneurship competence would be directly and positively related to entrepreneurial intentions. The analysis yielded the following results: $\beta = -.190$, $p = .816$. Also, after 5000 bootstrapping simulations, the lower and higher limits of the 90 % bias constrained and accelerated (BCa) CI of the direct effect between entrepreneurship competence and entrepreneurial intentions were $LI90 = -.161$ and $HI90 = .100$, respectively, with $p = .613$. H1 can thus not be accepted.

Hypothesis 2 predicted that entrepreneurship competence would positively affect attitude towards entrepreneurship. The results demonstrated that attitude towards entrepreneurship was, in fact, positively related to attitude towards entrepreneurship and that for each unit increase in competence, there is, *ceteris paribus*, an associated average .478 increase in attitude. The relationship is statistically significant at a $p = .002$ level. Such results allow H2 to be accepted.

Further, Hypothesis 3 predicted that attitude towards entrepreneurship would be positively related to entrepreneurial intentions. The results demonstrate a positive relationship between the two constructs. For each unit increase in attitudes, the associated rise in intentions, *ceteris paribus*, is, on average, .579 at a significance level of $p = .000$. Such results allow H3 to be accepted.

Hypothesis 4 predicted that attitude towards entrepreneurship would mediate the relationship between entrepreneurship competence and entrepreneurial intentions. The results demonstrate that for every unit increase in entrepreneurship competence, all else remaining equal, entrepreneurial intentions would, through the mediation of attitude, increase on average by .276 at the significance level of $p = .005$. Further, the results describing the direct effect of entrepreneurship competence on entrepreneurial intentions demonstrated no significant relationship as for $\beta = -.019$, the significance level was $p = .613$. However, results allowed a conclusion that there was a significant total effect of entrepreneurship competence on entrepreneurial intention directly and indirectly, through moderated mediation, i. e., for every unit increase of competence, the associated increase of entrepreneurial intentions, all else remaining equal, .257 on average and at the significance level of $p = .057$. Therefore, H4, which states that attitude

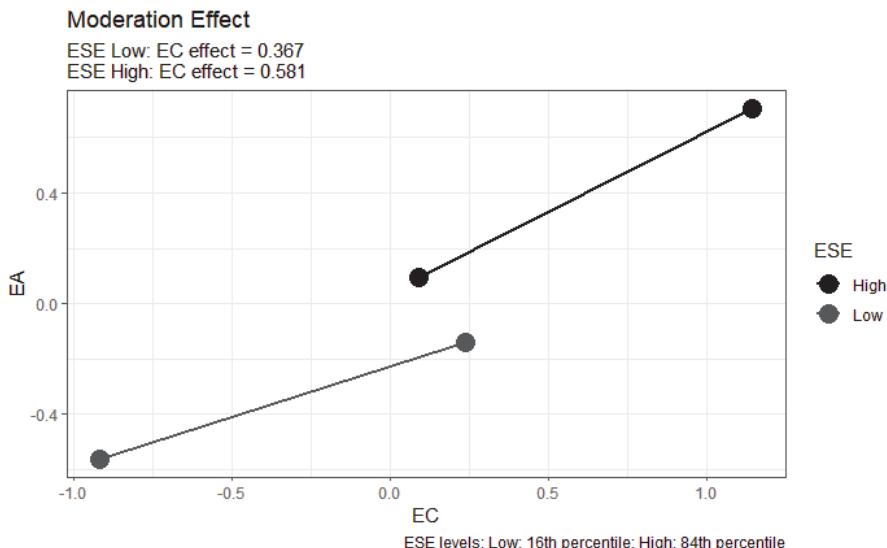
towards entrepreneurship will mediate between entrepreneurship competence and entrepreneurial intentions, can be accepted.

Finally, Hypothesis 5 anticipated a moderation effect of entrepreneurial self-efficacy on the relationship between the independent variable entrepreneurship competence and the mediator attitude towards entrepreneurship. The results yielded for the moderation effect demonstrated a positive and statistically significant moderation effect such that a unit increase in self-efficacy value can be, all else remaining the same, associated with a .345 rise in attitudes at the level of significance of $p = .004$, as can be seen in Figure 2. Such results allow for H5 to be accepted.

On top of that, the analysis of confidence intervals of the moderated mediation effect of the model yielded results of $LO90 = .014$ and $HI90 = .165$, and as 0 is not within the confidence interval range, the moderated mediation model can be accepted as valid.

The control variables, namely *gender* and *entrepreneurial family background*, did not play a significant role in the relationships between the antecedents of intentions and entrepreneurial intentions.

Figure 2: Moderation effect



Note: Figure 2 represents a tumble graph in which the width of each line depends on the distribution of the predictor (focal variable) at each moderator level (Bodner, 2016).

Table 1: The results of the Confirmatory factor analysis on the measurement model

Factor	Observed variables	Loadings
Entrepreneurship competence		
Spotting opportunities	$\alpha = .89, CR = .17, AVE = .64$.96
	I can find opportunities to help others.	.73
	I can find different examples of challenges that need solutions.	.81
	I can find examples of groups who have benefited from a solution to a given problem.	.85
	I can tell the difference between different areas where value can be created (for example, at home, in the community, in the environment, economy or society).	.82
Motivation and perseverance	$\alpha = .88, CR = .03, AVE = .59$.99
	I am driven by the possibility to do or contribute to something good for me or others.	.78
	I see tasks as challenges to do my best.	.72
	I can recognise different ways of motivating myself and others to create value. (Level 2)	.81
	I show passion and willingness to achieve my goals.	.76
Working with others	I do not give up and can keep going even when facing difficulties.	.81
	$\alpha = .83, CR = .24, AVE = .63$.90
	I can show respect for others, their background, and their situations.	.82
	I can recognise the role of my emotions, attitudes, and behaviours in shaping other people's attitudes and behaviours and vice versa.	.79
Attitude towards entrepreneurship	I can discuss the benefits of listening to other people's ideas for achieving my (or my team's) goals.	.77
	$\alpha = .83, CR = .64, AVE = .59$	
	My parents have a positive attitude towards entrepreneurs.	.85
	I have a positive attitude towards entrepreneurs.	.84
Entrepreneurial self-efficacy	In my opinion, society respects successful entrepreneurs.	.76
	People who have started their businesses and have failed should be given a second chance.	.57
	$\alpha = .83, CR = .64, AVE = .62$	
	I can identify my needs, wants, interests, and goals.	.71
	I can identify things I am good at and things I am not.	.84
	I believe in my ability to do what I am asked to do successfully.	.81

Note:

α = Cronbach's alpha

CR = Composite reliability

AVE = Average variance extracted

Table 2: Results for the decomposition of effects in the moderated mediation model using the bootstrap method

Regressions	Estimates	Standard Er- ror	p-value	Standardised Estimates
EA ~ EC	.477	.157	.002	.477
EA ~ ESExEC	.113	.039	.004	.345
EA ~ ESE	.142	.119	.234	.142
EI ~ EA	.583	.105	.000	.579
EI ~ EC	-.020	.084	.816	-.019
EI ~ Gender	.284	.157	.071	.141
Indirect effect: EC – EA – EI	.278	.120	.021	.276
Indirect effect: ESExEC – EA – EI	.066	.033	.047	.199
Direct effect: EA – EI	.583	.102	.000	.579
Direct effect: ESExEC – EA	.113	.049	.022	.345
Direct effect: EC – EA	.477	.195	.014	.477
Total effect: EC – EI	.258	.129	.045	.256
Total effect: ESExEC – EI	.066	.033	.047	.199

Note:

Entrepreneurial intentions – EI

Entrepreneurship competence – EC

Entrepreneurial self-efficacy – ESE

Attitude towards entrepreneurship – EA

5. Discussion

5.1 Theoretical contributions

The present study uses the proposed theoretical model with moderated mediation based on TPB to explain the interactions between the different constructs of entrepreneurial learning outcomes in primary school. Early adolescents learn differently from older students. While their aptness to learn competence or self-efficacy lags behind older students (Sagone et al., 2020), they are not so quickly distraught by stress (Stepánková et al., 2023) and are much more closely connected with their peers and teachers, which plays a role in how they learn in teams and under teachers' tutorship (Clark-Lempers et al., 1991; Spiekerman & Rose, 2024). The research results thus contribute to research on early adolescents in the psychological processes of entrepreneurial intention formation, a field where results from research on older students cannot be freely applied to the described differences between the disparate age groups.

The results demonstrate that no single antecedent is responsible for developing entrepreneurial intentions; an intricate interplay is at work. The results show that competence, attitude, or self-efficacy alone are insufficient for developing intentions. Specifically, developed competence will only positively affect intentions if the adolescent participant of EE programs has adopted a positive

attitude towards entrepreneurship, evidencing that attitudes positively mediate the relationship between competence and intentions. Moreover, entrepreneurship competence is significantly related to entrepreneurial intentions only indirectly, mediated by attitude towards entrepreneurship and moderated by entrepreneurial self-efficacy. The study also demonstrates that competence is more positively associated with attitudes if the participant has developed self-efficacy, and the latter moderates the relationship between competence and attitude. Surprisingly, gender and entrepreneurial family background do not play a significant role in how the constructs are interrelated.

While Liñán and Chen (2009) and Liñán (2008) demonstrated a robust positive effect of entrepreneurship competence on attitude towards entrepreneurship among university students, the present study extends these findings to a younger demographic. Notably, the same significant direct impact of entrepreneurship competence on attitude towards entrepreneurship was observed in the present study, suggesting that the relationship between entrepreneurship competence and attitude towards entrepreneurship may emerge earlier in the developmental process than previously recognised. This finding implies that a high level of self-perceived entrepreneurship competence has a significant psychological effect on early adolescents' attitude towards entrepreneurship, potentially influencing their career aspirations towards self-employment at a formative age (Athayde, 2009; Liñán, 2008).

Results evidence that attitude towards entrepreneurship is related to entrepreneurial intentions and this TPB model's theoretical path has been tested and confirmed on university students (Galvao et al., 2018; Liñán & Chen, 2009). Similarly, some studies in EE programs for early adolescents show entrepreneurship competence and attitude towards entrepreneurship increasing or decreasing synchronously (Garcia-Rodriguez et al., 2019; Tsakiridou & Stergiou, 2014). The antecedent-consequent relationship can be elucidated from the Liñán -Ajzen entrepreneurial intention model (Liñán & Chen, 2009) and from TPB itself. The finding holds for early adolescents, too, possibly meaning they will pursue a potential career in entrepreneurship if they have a positive attitude towards this way of life. It also means that the intention for such a career path does not solely depend on whether an individual possesses the competence needed for such a career.

The present study predicts that the psychological effect of entrepreneurship competence on attitude towards entrepreneurship is more substantial if the value of entrepreneurial self-efficacy is significant. Consistent with TPB and Boyd and Vozikis (1994), where entrepreneurial self-efficacy closely interacts with attitude towards entrepreneurship and entrepreneurial intentions, a positive relationship is demonstrated in the present study between entrepreneurship competence and attitude towards entrepreneurship when entrepreneurial self-efficacy is well de-

veloped. Thus, the present study enhanced the theoretical framework of TPB by adding the moderating effect of entrepreneurial self-efficacy to explain the dynamics between entrepreneurship competence as the direct antecedent of attitude towards entrepreneurship. Entrepreneurial self-efficacy has already been shown to positively moderate the effect of attitude towards entrepreneurship on entrepreneurial intentions (Pham et al., 2023). The enhanced model provides further contributions by explaining the relations between the given constructs for early adolescents, in whom the development of competence and self-efficacy is less efficient than in their older counterparts (Sagone et al., 2020). However, this seeming setback might be mitigated by their closeness with teammates and not feeling stressed as quickly as their older counterparts (Spiekerman & Rose, 2024; Stepánková et al., 2023).

The indirect effect of entrepreneurship competence on entrepreneurial intentions is mediated by attitude towards entrepreneurship, and the direct effect of entrepreneurship competence on attitude towards entrepreneurship is moderated by entrepreneurial self-efficacy in this study. Studies of primary school EE programs have thus far demonstrated the contemporaneous development of the three constructs (Barba-Sánchez & Atienza-Sahuquillo, 2016; Cárcamo-Solís et al., 2017) but have never attempted to explain the interactions between the measured constructs within an entrepreneurial intentions model. The present study builds on the literature evidencing that EE programs improve entrepreneurship competence, attitude towards entrepreneurship, entrepreneurial self-efficacy, and entrepreneurial intentions (Cárcamo-Solís et al., 2017; Fayolle & Gailly, 2015) and uses an upgraded theoretical model based on TPB to explain the interactions between the given constructs.

5.2 Practical contributions

The study has practical implications for teachers and policymakers but with some caveats. Firstly, the results demonstrate that despite the brevity of the startup weekend, early adolescents still form intentions similar to those of more extended EE programs. The finding shows that even for early adolescents, startup weekends are a legitimate way of entrepreneurial learning, which informs policymakers in their decision to keep funding short EE programs like startup weekends.

While it is true that early adolescents lag behind their older counterparts in how successfully they can learn competence or self-efficacy (Sagone et al., 2020), this can be mitigated by the fact that this age group is not so quickly fazed by stressful situations (Stepánková et al., 2023), which allows the conclusion that their attitude towards entrepreneurship, which is instrumental in intention formation, will not go sour at the first sign of trouble, and entrepreneurial self-efficacy will not wane quickly. Secondly, when signs of stress do start showing, early

adolescents can mitigate them by good relationships within their teams because, to early adolescents, closeness with peers is more impactful than to their older counterparts as their support for one another plays a crucial role in the process (Clark-Lempers et al., 1991; Spiekerman & Rose, 2024). Also, early adolescents look up to their teachers more than their older counterparts. Teachers are often seen as adult role models and someone they can trust. As such, they are essential for guiding their pupils throughout the startup weekend, helping them believe in the entrepreneurship competence they have mastered, and shaping a positive attitude towards entrepreneurship. In this way, they will aid pupils in forming entrepreneurial intentions (Brüne & Lutz, 2020).

Lastly, the role of outside experts who facilitated the startup weekend programs is crucial. They work for startup incubators (SPIRIT Slovenija, 2019), so they possess competence that might make them role models for early adolescent participants (Brüne & Lutz, 2020). This fact is also vital for self-efficacy formation because a self-efficacious teacher or expert will help build pupils' self-efficacy (Bandura, 1977), which is even more true for early adolescents (Clark-Lempers et al., 1991). Teachers who organise startup weekends for early adolescents are thus advised to hire the help of outside experts to use the startup weekend program for early adolescents to its fullest.

5.3 Limitations

First, the study's authors do not have detailed information on how the EE program teachers and mentors were trained. Different levels of entrepreneurship competence or entrepreneurial self-efficacy of the teachers might yield different results in the entrepreneurial learning of EE program participants. Second, startup weekends are particular EE programs with a fast-paced tempo and high work intensity, not to mention the level of knowledge the participants are expected to learn in such a short time. Thus, the study results are hardly applicable to other EE programs that have a longer duration. Third, most participants joined the EE programs of their own free will.

Consequently, some self-selection bias might have been present, which might have also affected the results. Fourth, not all the participants answered the questionnaire at the end of the program. Some responded some days after the program had ended. This fact may have slanted the results of the survey to some extent. Fifth, the cross-sectional design, measuring constructs only at the end of the startup weekend, focused only on exploring the relationships between constructs and did not directly measure the effect of the EE program, limiting the study's ability to analyse the program's impact on the evolution of the measured constructs. Sixth, the sample consisted only of pupils of Slovenian primary schools, which meant they had a similar cultural, economic, and social background. An exclusively Slovenian sample may have affected how the pupils an-

swered the survey and narrowed the ways the pupils perceived entrepreneurship education, thus possibly slanting the results. Lastly, half the respondents came to the program with prior EE experience, which put them in a position different from their teammates without expertise. In addition, about 30 % of the participants planned to attend an entrepreneurship competition, which might have heightened their motivation. While early adolescents are more connected with each other and thus help each other learn, this fact may still have affected results.

5.4 Future research

The study identified several areas for possible future research. The study found that entrepreneurial self-efficacy moderated the direct relationship between entrepreneurship competence and attitude towards entrepreneurship, but it is not yet clear how entrepreneurial self-efficacy influences other relationships within the TPB model. Future research could examine the impact of entrepreneurial self-efficacy on the attitude towards entrepreneurship, the connection between entrepreneurial intentions, and other relationships.

The current study was conducted with a limited sample of early adolescents from a relatively homogenous educational setting. Future research could be conducted with a more extensive and diverse sample, possibly spanning multiple educational programs or geographical regions. Such a sample would help ensure that the findings are generalisable to a broader population.

Additionally, the role of contextual factors, such as family, community, culture, and other environmental influences, in forming entrepreneurial intentions has not been well-studied. Future research could examine these factors to identify new ways to improve entrepreneurial learning outcomes.

Further, to avoid doing research with pupils from only one country, researchers may, in future collaborations, make use of international networks like the Danube Cup to extend their research to other countries, thus avoiding the possible entrapments of single-country research.

Lastly, entrepreneurial intention development is a long-term process, and it is not yet clear how entrepreneurship competence, attitude towards entrepreneurship, entrepreneurial self-efficacy, and entrepreneurial intentions evolve. Future research could employ a longitudinal design, measuring the constructs at the beginning and end of the EE program and possibly at follow-up intervals post-program. Such an approach would track construct development over time, comprehensively assess the program's efficacy, and provide insights into immediate and long-term impacts. Such research would offer a more profound understanding of the impact of EE programs on early adolescents.

6. Conclusion

The present study delves into the entrepreneurial learning outcomes of primary school entrepreneurship education programs and provides a deeper insight into the logic behind the entrepreneurial intention development process. Specifically, the study investigates the interrelatedness of entrepreneurship competence, attitude towards entrepreneurship, entrepreneurial self-efficacy, and entrepreneurial intentions in early adolescents participating in EE programs by inspecting how the constructs interact and impact each other. It proposes a theoretical model based on TPB to explain why entrepreneurial intentions develop and what is necessary for this to occur.

This study contributes significantly to the ongoing conversation about how entrepreneurial intentions are formed in primary schools and how the antecedents of intentions, namely competence, attitude, and self-efficacy, are interconnected, thus contributing to the body of knowledge on TPB. Results provide valuable insights for practitioners and researchers in entrepreneurship education. By enhancing our understanding of intention formation, better EE programs can be designed and implemented, ultimately fostering the next generation of successful entrepreneurs.

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