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An action phase theory approach to the configuration of entrepreneurial goal and implementation intentions

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Abstract

Purpose – This paper integrates the action phase theory (APT) and the theory of planned behaviour (TPB) to analyse the dynamic mechanisms involved in the configuration of goals and implementation intentions throughout the entrepreneurship process.

Design/methodology/approach – The empirical analysis compares individuals in different phases of this process (not yet decided, potential and nascent entrepreneurs). A large sample of adults from Spain is analysed. Structural equation models and multi-group analysis (MGA) serve to test the hypotheses.

Findings – The results confirm that perceived behavioural control (PBC) is the most influential antecedent of entrepreneurial goal intention (EGI) in pre-actional phases (undecided and potential entrepreneurs), whilst attitude towards entrepreneurship (ATE) takes this role during nascency. Subjective norms (SNs) are more important in Phase 1 (establishing the goal) and in Phase 3 (performing nascent behaviour).

Originality/value – This study contributes to both the TPB and the APT. It provides the most relevant insight into the mental process that leads to starting up and helps explain certain previous conflicting results found in the literature. Additionally, it has important implications not only for theory building but also for support bodies and for entrepreneurship educators.

Keywords Action phase theory, Theory of planned behaviour, Entrepreneurship process, Entrepreneurial intentions, Implementation intentions

Paper type Research paper

1. Introduction

Starting a venture is a complex process that involves various tasks and specific activities and takes a considerable length of time (Blank and Gabay-Mariani, 2023; Gielnik *et al.*, 2014; Mackiewicz, 2023; Van Gelderen *et al.*, 2018). Given its complexity, the advancement from goal setting to actual behaviour is not automatic or obvious. As explained by the action phase theory (APT) (Gollwitzer and Sheeran, 2006, p. 109): ". . . merely making the commitment to attain a goal does not necessarily prepare people for dealing effectively with self-regulatory problems in goal-striving".

Several potential problems may arise during this process. Founding a new venture involves the acquisition of information, taking risks, overcoming and managing emotions and also rational evaluation and decision-making. In this respect, it is substantially different from most other less complex decisional situations (Mackiewicz, 2023). Action crises are

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frequent and may lead to the termination of the new venture attempt (Ivanova and Tornikoski, 2022).

Therefore, even though the theory of planned behaviour (TPB) (Ajzen, 1991) is the most widely used theory to explain entrepreneurial intentions and behaviour (Van Gelderen *et al.*, 2015), the existing research has identified a substantial intention-action gap in this field (Kautonen *et al.*, 2015; Schlaegel and Koenig, 2014). Only a small fraction of the individuals expressing an entrepreneurial intention successfully completes the creation of their intended venture (Van Gelderen *et al.*, 2015, 2018). Entrepreneurial intention typically explains approximately 30% of the variance in entrepreneurial behaviour (Davidsson, 2023; Kautonen *et al.*, 2015; Shirokova *et al.*, 2016). It is, therefore, important to ascertain why this goal to start a venture may fail to materialise.

Calls have been made for a dynamic approach towards analysing intention models (e.g. Krueger, 2009). More generally, given its complexity, a process-oriented approach to analysing entrepreneurship has been advocated (McMullen and Dimov, 2013). The entrepreneurial process is frequently represented as involving a number of sequential stages before the new venture is fully operational (Davidsson and Gruenhagen, 2021; Ivanova and Tornikoski, 2022; Lichtenstein *et al.*, 2006, 2007). With regard to entrepreneurship, people are commonly classified as: uninvolved; potential entrepreneurs or nascent entrepreneurs (Bosma *et al.*, 2020; Reynolds *et al.*, 2005) [1].

The APT (Gollwitzer, 1990, 1993) adequately represents these stages that the entrepreneur experiences when starting a venture (Delanoë-Gueguen and Fayolle, 2019; Gielnik *et al.*, 2014; Ivanova and Tornikoski, 2022; Van Gelderen *et al.*, 2018). According to the APT, individuals would first decide on the goal to pursue (starting a venture), subsequently make plans to implement it and finally start acting to achieve it [2]. Throughout this process, task completion is frequently interrupted and several events may force a re-evaluation of the goals set (Gollwitzer, 1990; Lomberg *et al.*, 2019). Potential and nascent entrepreneurs will likely experience changes in their levels of goal intention and planning as they try to accomplish the different tasks within the entrepreneurial process (Krueger, 2009; McMullen *et al.*, 2021; Wood *et al.*, 2021). As a consequence, many thereof may completely abandon their goal.

Thus, understanding the formation of entrepreneurial intentions is important since its level and variation will affect commitment and advancement through the start-up process. The influence of each intention antecedent in the formation of the entrepreneurial intention is likely to vary at each stage, since the individual faces different problems and adopts different mindsets (Gollwitzer, 1990). The relative importance of personal attitude, subjective norms (SNs) and perceived behavioural control (PBC) in the formation of entrepreneurial intentions throughout the subsequent entrepreneurship phases will shed light on the key elements affecting the strength of goal intention at each stage.

The integration of the APT and TPB allows a deeper understanding of goal-intention formation and strength throughout the entrepreneurial process. This will make it possible to comprehend the influence of different variables and circumstances on the stability of intention and on the intention-action link; e.g. specialised knowledge (Blank and Gabay-Mariani, 2023), self-efficacy variability (Gielnik *et al.*, 2020), fear of failure or commitment (Gabay-Mariani and Boissin, 2021; Mackiewicz, 2023). It will also help clarify contradictory results found in the literature regarding the relative influence of TPB antecedents on the entrepreneurial intention.

The aim of this paper, therefore, is to understand the different formation of entrepreneurial goal intentions (EGIs) and planning (implementation intention, II) throughout the entrepreneurial process stages (undecided, potential and nascent entrepreneur). To this end, three groups of individuals are compared in the different phases, as carried out in previous APT studies (Gollwitzer, 1990, 1993, 2012; Sheeran *et al.*, 2005) and more recently in

entrepreneurship (Kariv *et al.*, 2023). In this way, we avoid potential problems in data collection. Retrospective responses may be subject to bias, since individuals often justify their actual behaviour rather than report their original preferences (Chell and Allman, 2003; Kwong and Thompson, 2016). Similarly, direct questions may lead to masking their true reasons (e.g. mentioning practical reasons instead of recognising a lack of ability) (Kwong and Thompson, 2016). In order to avoid these possible biases, we indirectly study their reasons by analysing the actual strength of the antecedents-to-intention relationship for people in each stage of the process.

Following this introduction, the relevant literature is analysed in the next section and hypotheses are derived. Sections three and four describe the methodology and results, respectively. These results are then discussed in Section five. This paper ends with a brief conclusion.

2. Theory

The TPB (Ajzen, 1991) is the most widely used model to analyse EGIs (Kautonen *et al.*, 2015; Krueger *et al.*, 2000; Liñán and Chen, 2009; Liñán and Fayolle, 2015; Schlaegel and Koenig, 2014). According to this theory, the EGI is determined by three motivational antecedents. First, the attitude towards entrepreneurship (ATE) reflects the overall (positive or negative) personal evaluation about becoming an entrepreneur. The ATE represents how desirable performing the behaviour is for the person (in terms of the expected outcomes and consequences). The TPB adopts an expectancy-value framework to analyse goal setting (Brandstätter *et al.*, 2003). In this way, the ATE may be assimilated into desirability (Fitzsimmons and Douglas, 2011; Krueger, 2000; Krueger *et al.*, 2000).

Second, PBC indicates the level of conviction that the act of performing entrepreneurial behaviour remains under the individual's personal control. PBC reflects the perceived feasibility of performing the behaviour (Krueger *et al.*, 2000), and it is therefore close to the concept of self-efficacy (Fitzsimmons and Douglas, 2011). Third, the SNs represent the perceived social pressure to perform start-up behaviour. SNs reflect the support the person would expect to receive from important reference people if that person became an entrepreneur.

The TPB ultimately predicts behaviour, using the intention as its direct antecedent (Ajzen, 1991; Krueger *et al.*, 2000). Nevertheless, most authors consider the entrepreneurial intention to be a goal intention (Gielnik *et al.*, 2014; Van Gelderen *et al.*, 2015, 2018), which needs additional planning and the performance of several specific tasks to be successfully fulfilled (Brandstätter *et al.*, 2003). This calls for the consideration of complementary approaches that focus on the entrepreneurial process.

The dynamics of new-venture creation imply several subsequent phases and transitions from one stage to the next (Lichtenstein *et al.*, 2006, 2007). These stage changes can involve a substantial transformation in the vision and the strategy of the new venture (Lichtenstein *et al.*, 2006). This has only recently been considered in entrepreneurship research by separating the decision to start a venture (goal intention) from the planning of the steps necessary to start the venture (action planning or implementation intention) (Gielnik *et al.*, 2014; Van Gelderen *et al.*, 2015, 2018).

In particular, the APT (Gollwitzer, 1990; 1993, 2012) proposes that the goal intention is first set, and implementation plans are subsequently developed (Van Gelderen *et al.*, 2018). This approach has also been labelled as the entrepreneurial Rubicon model (Delanoë-Gueguen and Fayolle, 2019; Heckhausen and Gollwitzer, 1987) since goal setting implies the change from a deliberative stage to a subsequent planning stage. In the case of entrepreneurship, the goal involves becoming an entrepreneur (starting up a venture) (Delanoë-Gueguen and Fayolle, 2019; Van Gelderen *et al.*, 2018).

The APT (Gollwitzer, 1990, 1993, 2012) predicts goal achievement. It establishes four stages that individuals go through as they evolve from goal setting to a final evaluation in any decision-action process. First, deliberation is a pre-decisional stage in which the person has not yet made up their mind (Gollwitzer, 1990). Second, action planning is a pre-actional stage in which the person has already made the decision (and has set their goal) but has not yet started performing any actions. Third, the action phase corresponds with the performance of the behaviour needed to achieve the goal (goal striving). Finally, the fourth stage is evaluation, characterised by reflection on the process and its results and serves as the basis for considering future goals and actions (Gollwitzer, 1990).

The different phases are characterised by different tasks (deliberation, planning, acting and evaluation). These phases are sequential in nature, delimited by three specific boundaries: the making of a decision (Rubicon crossing) indicates the change from phase one to phase two; the initiation of specific actions marks the change from phase two to phase three; and the conclusion of these actions represents the movement from phase three to phase four (Gollwitzer, 1993, 2012). Each of these phases is matched by a corresponding mindset: a congruent cognitive orientation that promotes the completion of the main task in each phase (Gollwitzer, 1990, p. 63). Once the individual crosses any of these boundaries, the nature of the task at hand is changed, as is the corresponding mindset.

The APT has recently been used in entrepreneurship research to complement the TPB. Van Gelderen *et al.* (2018) focus on the transition from phase two to phase three. They use both goal intention and implementation intention as key explanatory variables. These two variables are employed to explain the realisation of entrepreneurial actions (phase three). Delanoë-Gueguen and Fayolle (2019), in turn, focus on the change from phase one to phase two (from deliberation to planning) using the Rubicon-crossing metaphor (Gollwitzer, 1993, 2012; Heckhausen and Gollwitzer, 1987). In both cases, since they analyse just one stage-transition, they fail to offer an explanation for the dynamic evolution of individuals' perceptions throughout the process.

Several studies find a moderating role of attitude (motivational beliefs regarding the expected outcomes of starting up) on the intention-action relation (Delanoë-Gueguen and Liñán, 2019; Blank and Gabay-Mariani, 2023) and suggest ATE might be more important in predicting EGI at the nascency stage, as found by certain authors (Urban and Chantson, 2019; Blaese and Liebig, 2021). Other studies, in turn, find PBC to be more influential in explaining EGI (Feola *et al.*, 2019; Ndofirepi, 2022). Similarly, there is controversy regarding whether SN is a significant predictor of EGI (Blaese and Liebig, 2021; Feola *et al.*, 2019) or whether it is not (Goethner *et al.*, 2012; Lee-Ross, 2017).

A few studies take the APT as a reference (Blaese and Liebig, 2021; Blank and Gabay-Mariani, 2023) but use different strategies to control for the APT stage of respondents. Since there is no direct comparison of individuals in each stage, these studies fail to help in solving those contradictory findings. On the other hand, Kariv *et al.* (2023) specifically consider APT stages, but use this as their dependent variable, without measuring EGI.

Even though EGIs are set during phase one (Sheeran *et al.*, 2005), their volitional strength may vary throughout the process (Van Gelderen *et al.*, 2018; Donaldson *et al.*, 2022; Mackiewicz, 2023; Shir and Ryff, 2022). External factors may affect progress in striving for the chosen goal after it has been set. This will depend "... on its volitional strength (as compared with that of other competing goal intentions) and on how favourable the situation is for readily initiating the particular goal intention (as compared with initiating competing goal intentions and as compared with relevant future opportunities one hopes to encounter)" (Gollwitzer, 1993, p. 58). Additionally, certain internal factors, such as doubt and self-control (Van Gelderen *et al.*, 2015) and procrastination and fear of failure (Mackiewicz, 2023), may contribute to accelerating or delaying the process and indirectly affect the level of both goal intention strength and planning.

In this research, therefore, we integrate APT and TPB by considering the evolution of EGIs and IIs (planning) throughout three APT stages (deliberation, planning and action). Our analysis focusses on the first three stages of the APT, since our aim is to understand venture creation by analysing the relative influences of ATE, SN and PBC at each of these three stages. In contrast, the fourth stage (evaluation after the venture has been created) falls outside the scope of our research question. A similar research design was used by Sheeran *et al.* (2005).

2.1 Development of the hypotheses

Entrepreneurial behaviour is complex (Gielnik *et al.*, 2014). A lay person (still in the deliberative phase and thus undecided) may have only a general notion regarding the start-up process (Van Gelderen *et al.*, 2015). In this situation, individuals are striving to decide whether their wish to become entrepreneurs should be set as a goal (Gollwitzer, 1990). For this reason, they will have to ponder how desirable (reflected in ATE and SNs) and feasible (reflected in PBC) this wish is, not only in itself, but also in relation to other competing wishes (Gollwitzer, 1993).

During this first phase, the individual develops a corresponding "deliberative mindset" (Gollwitzer, 2012). This is characterised by a cognitive tuning towards accurate and impartial processing of information regarding the desirability and feasibility of this wish (Gollwitzer, 1990, 2012). In the case of entrepreneurship, given the complexity of the goal (to start a venture), the concern about lacking the necessary skills and knowledge is probably the most significant barrier (Gollwitzer, 1993; Kwong and Thompson, 2016). That is, entrepreneurship is the kind of process over which there is very little volitional control. Given the risks associated with entrepreneurship and the serious consequences of possible mistakes, during this phase the individual will be particularly focussed on pondering its difficulties and costs (Fitzsimmons and Douglas, 2011). In this context, the predictive ability of PBC to explain goal intention should be the strongest (Armitage and Conner, 2001).

In phase two, the decision has been made and the goal is set. This pre-actional phase is characterised by the development of action plans to achieve the goal. During this phase, the "implemental mindset" is developed (Gollwitzer, 2012), typified by a cognitive tuning toward information relevant to when, where and how to act and a sense of focus on the information that helps to promote the chosen goal. In this phase, actions are planned to determine how to attain this goal and thus facilitate its achievement (Van Gelderen *et al.*, 2018).

The importance of setting these plans is greater for the difficult-to-implement goals (Gollwitzer, 1993; Gollwitzer and Sheeran, 2006). Given that starting a business is an all-encompassing goal, individuals will also need to identify the specific start-up tasks and activities to help achieve that goal and to select which one thereof they intend to work on (Brandstätter *et al.*, 2003; Van Gelderen *et al.*, 2018). "A person may be uncertain about what to do, where to start, and how to choose between different courses of action, leading to difficulties in action planning" (Van Gelderen *et al.*, 2015, p. 658). For this reason, perceived ability and knowledge should become the primary concern in determining exactly how and when to perform each of the specific and tangible tasks needed to attain this goal (Bolzani *et al.*, 2021; Mitchell and Shepherd, 2010; Tumasjan *et al.*, 2013).

Entrepreneurial behaviour requires a high level of commitment and is characterised by incomplete volitional control (Hallam *et al.*, 2016; Krueger *et al.*, 2000). Kwong and Thompson (2016) argue that a perceived lack of knowledge and skills is likely to make individuals postpone their effective action to start up the venture. During the pre-actional stages (phases one and two), insufficient confidence in one's own abilities can therefore constitute a strong reason for deciding against following an entrepreneurial career path (Gielnik *et al.*, 2020; Rae and Woodier, 2006). Similarly, a lack of knowledge may hinder the formation of

implementation plans (how the action is to be performed) (Gollwitzer, 1993). In this context, PBC is expected to play a more important role (Armitage and Conner, 2001) and will therefore be the most important predictor of EGI in phases one and two.

In contrast, in phase 3, the individual is already acting based on their plans (having developed their IIs). They have established how to carry out the various tasks involved in starting up and will hence adhere to their predefined action plan. For this reason, the influence of PBC on their level of EGI will be weaker, since the tasks to be carried out are already known in advance. We therefore formulate the following hypothesis:

H1. The influence of PBC on EGIs is stronger in phases 1 and 2 compared to that in phase 3.

Action initiation represents the boundary line leading to phase three. The actional mindset shows a cognitive tuning toward cues guiding the course of action to the attainment of that goal (Gollwitzer, 1990). Individuals have made up their mind and have a plan and thus focus on effectively achieving the desired outcomes. Goal and implementation intentions together, once formed, "... are thought to provide commitment which ultimately serves the same purpose, that is, to promote goal achievement" (Gollwitzer, 1993, p. 176). In this phase, goal intention (and its volitional strength) is still emphasised, and its level may vary depending on the person's experiences whilst attempting to initiate relevant actions (Gollwitzer, 1990).

In the pre-actional phases, given the individual has not yet faced action and has not confronted stakeholders (potential partners, funders, suppliers, customers . . .), the emotional complexities involved in the process are yet to be fully felt. At these stages, the individual is still focussed on their ability to perform the different tasks involved and the practical knowledge needed (PBC), and therefore, ATE will be a less important predictor of EGI.

In turn, during the actional phase, the individual is likely to face obstacles or setbacks in performing the planned behaviour (Gielnik *et al.*, 2014). These hindrances are likely to emotionally affect the individual and may weaken their commitment (Gabay-Mariani and Boissin, 2021). The intensity of the desired outcomes (seen as a motivation) is probably more important in overcoming those barriers and in maintaining the volitional strength of the goal intention (Gollwitzer, 1990). In particular, given the superordinate character of the starting-a-venture goal, the evaluation of subordinate actions already taken (e.g. developing a prototype or finding suitable premises) may affect the overall EGI (Van Gelderen *et al.*, 2018). Thus, goal desirability (measured as ATE) should constitute a predictor of intention of greater importance at this stage. This has been empirically confirmed by Varamäki *et al.* (2016) with a sample of nascent entrepreneurs. Therefore, the following hypothesis is proposed:

H2. The influence of ATE on EGIs is stronger in phase 3 compared to that in phases 1 and 2.

Regarding the role of SNs, these represent the social support for becoming an entrepreneur as perceived by the individual through their referent people (Kwong and Thompson, 2016). The three TPB motivational antecedents (ATE, SNs and PBC) are interrelated, and the individual's stance with respect to that behaviour is also likely to affect the relative influence of these antecedents (Ajzen, 1991). In the case of entrepreneurship, SNs have been hypothesised to affect ATE and PBC (Fretschner and Weber, 2013; Liñán and Chen, 2009; Ramos-Rodríguez *et al.*, 2019). Relevant others (e.g. family, peers and mentors) may serve as a "filter that distils perception of structural barriers" (Lent *et al.*, 2000, p. 45). These people act as social models and provide a reference for understanding that which is involved in becoming an entrepreneur.

In the case of ATE, one of the positive results expected from starting up is the recognition by relevant others (social recognition and status) (Edelman *et al.*, 2010; Renko *et al.*, 2012; Stephan *et al.*, 2015). In the case of PBC, the support from relevant others is a source of

vicarious learning (Bandura, 1986) and will also increase potential access to resources (Brush *et al.*, 2001), thereby facilitating a perception of increased environmental munificence (Bacq *et al.*, 2017). Therefore, a more positive SN (expected support from relevant others) contributes to a more positive evaluation (ATE) and to higher perceived control (PBC) of the start-up behaviour.

H3. The SN is positively related to (1) ATE and (2) PBC.

During phase one, individuals decide whether the goal is worth pursuing. As lay people, they have relatively little direct knowledge of what starting up a venture entails. In this situation, the opinions of referent people are probably more relevant, since they serve as a representation of the social view and a first external evaluation of the desirability and feasibility of this goal (Meoli *et al.*, 2020). In phase two, in contrast, the relative importance of SNs in predicting the level of EGI strength should be relatively weaker, since the focus is set on planning the various tasks that need to be performed.

During phase three, access to resources becomes essential. A non-trivial share of these resources may be accessed through close contacts, many of which will be referent people. Thus, as explained by Meoli *et al.* (2020), relevant others provide access to valuable information (Kacperczyk, 2013), help in acquiring the needed knowledge (Baron and Henry, 2010) and grant access to critical resources (Brush *et al.*, 2001). For this reason, SNs are again more important in phase three, since perceived approval facilitates and encourages the effective use of close contacts for help and access to these resources.

H4. The influence of SN on EGIs is stronger in phases 1 and 3 compared to that in phase 2.

According to the APT, individuals develop their action plans in phase two, after having set their goals (Gollwitzer, 1990, 1993). Once they have decided what they want to achieve, they set themselves to learn "how to best attain the chosen goal" (Van Gelderen *et al.*, 2018, p. 926). In this regard, a higher level of EGI will render individuals more committed towards the entrepreneurial action and, therefore, more inclined to develop specific IIs. In contrast, individuals with low EGI (undecided, or only weakly committed towards that goal) are expected to exert little effort to develop action plans. The following hypothesis is therefore proposed:

H5. EGI is positively related to II.

3. Methodology

3.1 Sample

The population under study is made up of adults in Spain presenting different levels of involvement in entrepreneurship. The data was collected between March and May 2018 as part of a larger project. Firstly, a number of entrepreneurship support organisations were approached, through which organisation users were invited to participate. Secondly, adults with a university education (alumni from a large university graduated in the last 5 years) were also invited. This sample represents a population segment that is more likely to consider entrepreneurship as a career path (Bosma *et al.*, 2020). Initially, 2,341 complete questionnaires were collected, but after the outliers were excluded, a total of 2,207 questionnaires were analysed.

A classifying question was asked at the start of the questionnaire for the respondents to place themselves in one of the four APT phases (have not seriously thought about starting a venture, intending to start it up within the subsequent three years, currently starting up a venture, having already launched the venture). A similar approach has been utilised by

Kariv *et al.* (2023). Since 432 respondents had already created their firm (APT's phase 4, evaluation), they were hence excluded from further analysis, as explained above.

Our study sample therefore includes a total of 1,775 responses: 939 pre-decisional individuals who have not yet decided to set up a firm (APT phase 1, deliberation); 573 potential entrepreneurs (APT phase 2, planning); and 263 nascent entrepreneurs (APT phase 3, action). The sample size for each phase is sufficiently large to derive meaningful results (Hair *et al.*, 2017). The sample distribution for the control variables is shown in Table 1.

3.2 Measures

The dependent variables are EGI and Implementation Intention (II). The EGI scale was originally developed by Liñán and Chen (2009), whilst the II scale was developed based on that by Brandstätter *et al.* (2003). All the response options of the items range from 1 ("strongly disagree") to 5 ("strongly agree"). A sample item for EGI is "I am determined to start a venture in the future". A sample item for II is "I know the specific steps I have to take to create my company".

The independent variables are the motivational antecedents of intention. All the constructs are measured using Likert-type scales with response options ranging from 1 ("strongly disagree") to 5 ("strongly agree"). To measure ATE, an 8-item scale was used, based on that by Fernández-Serrano and Romero (2013). This assesses the importance placed on different motives for starting up (Kautonen *et al.*, 2013), that is, the reasons leading them to become entrepreneurs (Kolvereid, 1996). "In the entrepreneurial context, this attitude reflects the individual's motives to become involved in business creation" (Blank and Gabay-Mariani, 2023, p. 1089). After a common introductory sentence ("Are the following motivations important for you to become an entrepreneur?"), one sample item is "developing myself personally and professionally".

The PBC was measured through a 6-item scale that asked about the feeling of being able to effectively carry out certain entrepreneurship-related tasks (Liñán *et al.*, 2016). One sample item is given as "To define my business idea and the strategy of a new company". SNs were measured through a 3-item scale developed by Liñán and Chen (2009). One sample item is

Variable	Category	N	%
Sex	Male	823	46.4
	Female	952	53.6
Age	18–25	674	38.0
	26–35	905	51.0
	36–45	130	7.3
	46–55	54	3.0
	56–65	12	0.7
Socio-economic Level	Low	507	28.5
	Medium	1,020	57.5
	High	248	14.0
Educational Level	Studies prior to University Degree	58	3.3
	University Degree	662	37.3
	Master's or PhD	1,055	59.4
Previous work experience	No experience	205	11.5
	Experience as a salaried worker	1,209	68.1
	Experience as a self-employed worker	35	2.0
	Experience as a salaried and self-employed worker	326	18.4
Entrepreneurship Phase	Phase 1	939	52.9
	Phase 2	573	32.3
	Phase 3	263	14.8

Source(s): Authors' own work

Table 1. Respondents' demographics

"Regarding the creation of your company, to what extent do the following people approve of this decision? My closest family".

A number of control variables were also considered: sex, age, educational level and self-employment experience. Women are shown to be traditionally less likely to follow an entrepreneurial career (Santos *et al.*, 2016; Shinnar *et al.*, 2018). A dichotomic sex variable (1 = men, 2 = women) was included. Entrepreneurship rates also differ with age and educational attainment (Kelley *et al.*, 2012). Thus, a variable was included to control for age classified in five intervals (18–25, 26–35, 36–45, 46–55 and 56–65), labelled from 1 to 5, respectively. Education was assessed with a categorical variable (values 1 = pre-university level; 2 = graduate degree; 3 = postgraduate degree). Self-employment experience has also been identified as an important variable influencing entrepreneurial activities (Gielnik *et al.*, 2018). The corresponding dichotomic variable takes the value 0 if the respondents have no experience and the value 1 when they have any such experience.

3.3 Data analysis

Partial least squares (PLS) was utilised to estimate path coefficients and test the hypotheses. Several reasons make this methodology preferable herein (Roldán and Sánchez-Franco, 2012). Firstly, the nature of the variables included in the model responds to a composite mode design (mode A (reflective) and mode B (formative) composites). Secondly, PLS-structural equation modelling (SEM) is especially suitable for multi-group analysis (MGA) since it includes non-parametric techniques (Hair *et al.*, 2017; Henseler *et al.*, 2016b; Sarstedt *et al.*, 2011). The SmartPLS software (Ringle *et al.*, 2015) was employed for the analysis.

In order to assess the research model, a two-stage procedure is adopted (Hair *et al.*, 2017). First, the measurement model (outer model) is evaluated. Second, the structural model (inner model) is assessed through the path coefficients, explanatory power (R^2) and the Square root mean residual (SRMR) (Henseler *et al.*, 2016a). Finally, the MGA searches for significant differences in path coefficients between the APT phases, using the permutation test (Chin and Dibbern, 2010). The measurement invariance (a necessary requirement to perform the MGA) has been confirmed using the measurement invariance of composite models (MICOM) technique, which is suitable for PLS-SEM (Henseler *et al.*, 2016b).

Ex ante measures were taken in an attempt to avoid common method bias (CMB). Respondents were assured that there were no right or wrong answers and that responses were anonymous (Podsakoff *et al.*, 2003). To test the presence of CMB, we employed the measured latent marker variable (MLMV) approach (Chin *et al.*, 2013). The socio-economic level of the interviewees (a single indicator with no expected relationships with any of the model variables) was used. The results show that: (1) all paths from the MLMV to the model constructs are non-significant, except the path to PBC ($p < 0.05$); (2) the fit for the MLMV model is worse than the original model; and (3) the path coefficients do not significantly differ from the original estimates. These results suggest that CMB is not present in our data.

4. Results

The control variables have several significant effects on II. Women exhibit lower implementation levels ($\beta = -0.038$, $p < 0.05$), as do younger people ($\beta = 0.077$, $p < 0.001$). In turn, self-employment experience is associated with a higher II ($\beta = 0.109$, $p < 0.001$). All these results were expected, with their effects being relatively small [3].

4.1 Measurement model assessment

Table 2 shows the weights and loadings of Mode A (reflective) and B (formative) composite variables (Henseler *et al.*, 2014, 2016a, b). For Mode A composites, loadings higher than 0.7

Constructs/items	Weights	Loading	CR	AVE
ATE (Mode B composite)			n.a	n.a
ATE1. Developing myself personally and professionally	0.546***	0.755		
ATE4. Lacking another economic alternative (unemployment)	−0.224***	−0.289		
ATE6. Insecure and precarious employment	−0.195***	−0.179		
ATE7. Flexibility in lifestyle	0.117*	0.432		
ATE8. Desire for independence and working for myself	0.575***	0.756		
PBC (Mode A composite)			0.902	0.605
PBC1. To define my business idea and the strategy of a new company	0.274***	0.829		
PBC2. To maintain the process of creating a new company under control	0.239***	0.806		
PBC3. To negotiate/maintain favourable relations with potential investors/banks	0.195***	0.720		
PBC4. To recognise opportunities in the market for new products and/or services	0.236***	0.766		
PBC5. To start a new company	0.311***	0.842		
SNs (Mode A composite)			0.926	0.806
SN1. My closest family	0.367***	0.859		
SN2. My friends	0.378***	0.930		
SN3. My colleagues	0.369***	0.903		
EGI (Mode A composite)			0.958	0.851
EGI1. It is very likely that I will start a venture one day	0.363***	0.942		
EGI2. I am willing to make every effort to become an entrepreneur	0.342***	0.926		
EGI4. I am determined to start a business in the future	0.361***	0.947		
II (Mode A composite)			0.955	0.877
II1. I know what specific steps I must take to create my company	0.348***	0.916		
II2. I know when I will take each of the steps to create my company	0.369***	0.951		
II3. I know where I will carry out each of the steps to create my company	0.350***	0.942		

Note(s): ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$ (based on t(4,999), two-tailed test)
Source(s): Authors' own work

Table 2.
Measurement model assessment

indicate satisfactory reliability (Hair *et al.*, 2017). Only one of the EGI construct items (EGI3) had a lower loading and was therefore dropped. Composite reliabilities (CRs) are greater than 0.7 and the average variances extracted (AVEs) are higher than 0.5, and therefore, convergent validity is acceptable (Hair *et al.*, 2017). For the Mode B composite construct (ATE), the maximum variance inflation factor (VIF) is 1.522 (below the usual threshold of 3). Our data therefore presents no multi-collinearity problems. Furthermore, three items (ATE2, ATE3 and ATE5) have been deleted since they have non-significant weights and loadings below 0.5 (Hair *et al.*, 2017).

Both the Fornell–Larcker approach and the most restrictive Heterotrait-Monotrait (HTMT) ratio (Henseler *et al.*, 2015) support the existence of discriminant validity for all the Mode A latent variables (see supplementary file for details). To assess the convergent or external validity of the Mode B composite, the construct is connected with the same construct, but modelled as a Mode A composite. The resulting path coefficient is greater than the suggested threshold of 0.8 (Hair *et al.*, 2017). Therefore, convergent validity can be assumed for ATE. Table 3 displays the means and standard deviations of the model variables as well as the correlation matrix.

4.2 Structural model assessment

Figure 1 shows the path coefficients, which are all significant ($p < 0.001$). The SRMR value is 0.065, clearly lower than the recommended threshold of 0.10 (Henseler *et al.*, 2016a; Ringle

et al., 2015). Thus, the model fit can be considered satisfactory. Overall, the model explains over 45% of the variance in EGI and over 56% of the variance in II. All the values of the cross-validated redundancy measure (Q^2) are positive, thereby indicating predictive relevance for the endogenous constructs: ATE, PBC, EGI and II (Hair et al., 2012). An f^2-effect size between 0.15 and 0.35 indicates a medium-level impact of the exogenous constructs on the R^2 of the endogenous construct (Hair et al., 2017), whilst an f^2 higher than 0.35 indicates a large effect size. Our results reflect medium-level f^2 effect sizes of SNs on PBC and of PBC on EGI, whilst EGI has a large effect on II. The other effects are small (see supplementary file for details).

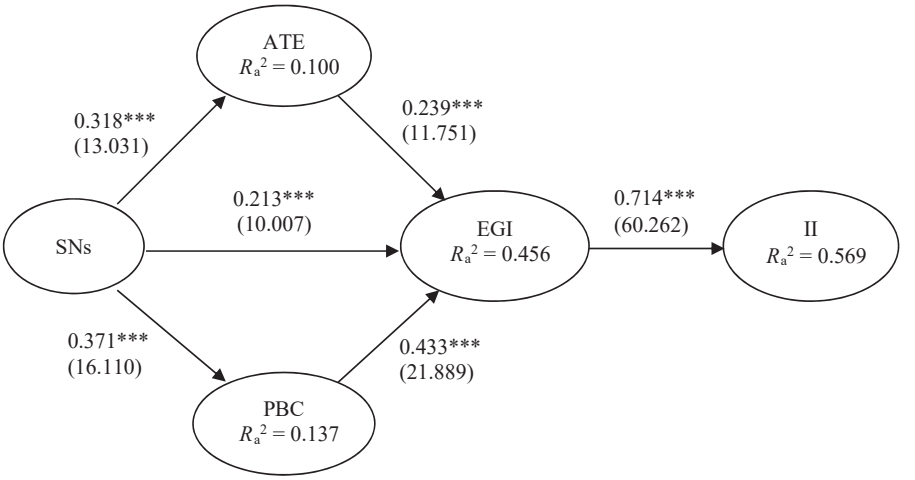
4.3 Multi-group analysis (MGA)

Table 4 shows the structural model results for each phase and the MGA using the permutation method (Chin and Dibbern, 2010). According to the results from the MICOM procedure (Henseler et al., 2016b), the partial measurement invariance has been established for all groups, except for the II variable when comparing phases one and three [4].

Table 3. Means, standard deviations and correlations of the model variables

	Mean	S.D.	Correlations ATE	PBC	SNs	EGI	II
ATE_	3.918	0.908	1				
PBC	4.385	0.906	0.312	1			
SNs	4.187	0.848	0.318	0.371	1		
EGI	3.691	1.159	0.442	0.587	0.450	1	
II	3.129	1.194	0.293	0.569	0.412	0.744	1

Source(s): Authors' own work



Notes(s): *t* values in parentheses. Percentile Bootstrapping 95% confidence (based on $N = 5000$ subsamples)

***$p < 0.001$; (based on $t(4999)$, two-tailed test). $t(0.05, 4999) = 1.645$; $t(0.01, 4999) = 2.327$; $t(0.001, 4999) = 3.092$

Source(s): Author's own work

Figure 1. Estimated Model (full sample)

Table 4. Structural Model Results and MGA per phase

Path coef	Estimated models[a]			Multigroup analysis (MGA)[b]					
				Phases 1/2		Phases 2/3		Phases 1/3	
	Phase 1	Phase 2	Phase 3	Coef Dif	Supported	Coef Dif	Supported	Coef Dif	Supported
SNs → ATE	0.233*** (5.902)	0.192*** (4.394)	0.412*** (5.947)	0.041 ns (0.210)	No	−0.220** (0.004)	Yes	−0.179** (0.001)	Yes
SNs → PBC	0.300*** (9.071)	0.225*** (5.374)	0.319*** (4.365)	0.075 ns (0.078)	No	−0.095 ns (0.232)	No	−0.009 ns (0.412)	No
SNs → EGI	0.171*** (5.443)	0.069 ns (1.671)	0.195*** (3.712)	0.102* (0.028)	Yes	−0.126 ns (0.085)	No	−0.025 ns (0.330)	No
ATE → EGI	0.173*** (4.875)	0.285*** (6.751)	0.438*** (8.270)	−0.112* (0.012)	Yes	−0.153* (0.030)	Yes	−0.266*** (0.000)	Yes
PBC → EGI	0.436*** (15.270)	0.367*** (9.731)	0.238*** (4.567)	0.068 ns (0.058)	No	0.129 ns (0.062)	No	0.198*** (0.000)	Yes
EGI → II	0.611*** (30.380)	0.432*** (12.381)	0.550*** (10.389)	0.179*** (0.000)	Yes	−0.118* (0.043)	Yes	–	–

Note(s): [a] t Bootstrapping values in parentheses; [b] p values in parentheses
Percentile 95% confidence (based on $N = 5{,}000$ subsamples). ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; ns = not significant
Source(s): Authors' own work

Regarding the path coefficients from PBC to EGI, there are no significant differences between phases one and two nor between phases two and three. In turn, the path is significantly higher in phase one, when compared to phase three. PBC can thus be claimed to have a greater effect on EGIs in phase one compared to phase three. This provides at least partial support for hypothesis H1. Meanwhile, the ATE-EGI path-coefficient differences are significant between all the phases. Therefore, ATE is found to have the strongest influence on EGIs in phase three, as proposed in hypothesis H2.

In the case of SNs, H3 is fully supported in all the stages since SN is significantly related to ATE and PBC. Regarding the coefficient from SNs to EGIs, a significant difference is found only between phases one and two. Therefore, support for H4 can be partially claimed.

Table 5 shows the adjusted coefficient of determination (R^2) of the endogenous constructs for each of the three phases. In all phases, the SRMR is satisfactory (Ringle *et al.*, 2015). The Q^2 measure is positive in all phases. In turn, the f^2-effect sizes differ per stage. As observed, in phases one and two, PBC has a medium effect on EGI. In phase three, ATE is the variable that has a medium effect on EGI. These results complete those obtained in the MGA and provide additional support for our hypotheses H1 and H2. Finally, both for the full sample and for each different phase, H5 is fully confirmed, since EGI is significantly related to II in all cases.

4.4 Post-hoc analysis: levels of the constructs

The results above support the argument that TPB antecedents affect EGI differently at each phase of the entrepreneurship process. However, changes should also be expected in the level of each variable at each phase, in accordance with APT predictions. In phase one, individuals have not yet decided whether to pursue an entrepreneurial career (Delanoë-Gueguen and Fayolle, 2019), let alone made detailed action plans (II). In phase two, in turn, the implemental mindset leads to "... an overly optimistic analysis of feasibility-related information and a partial analysis of desirability-related information" (Gollwitzer, 2012, p. 537). Thus, individuals in phase two should exhibit higher levels of ATE, PBC and SNs (when compared with those in phase one). The EGI should consequently also be higher for individuals in phase two.

In phases two and three, goal intentions and their antecedents should remain relatively stable (Gollwitzer, 1990, 1993). Individual variations may occur, as explained above, but, at the aggregate level, they should cancel each other out. Similarly, IIs are most intensely

	R^2			f^2			Q^2		
Constructs	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
ATE	0.053	0.035	0.167				0.012	0.007	0.034
SNs				0.057	0.038	*0.205*			
PBC	0.090	0.050	0.099				0.056	0.025	0.057
SNs				0.099	0.053	0.114			
EGI	0.336	0.291	0.446				0.274	0.215	0.356
ATE				0.042	0.105	*0.278*			
SNs				0.039	0.006	0.055			
PBC				*0.256*	*0.172*	0.089			
II	0.396	0.213	0.305				0.331	0.156	0.225
EGI				*0.609*	*0.235*	*0.429*			
Analysis of the goodness of fit					*SRMR*		0.055	0.075	0.083

Note(s): Medium ($f^2 > 0.15$) and large ($f^2 > 0.35$) effects are marked in italics
Source(s): Authors' own work

Table 5.
Model fit statistics per phase

developed during phase two (Gollwitzer, 1990, 1993, 2012). Therefore, a higher level of II is clearly expected in phases two and three.

Table 6 compares the mean values of the relevant variables in each phase. The *F* statistic confirms that the mean ATE value remains stable between phases two and three, whilst the means for all other constructs increase significantly from each phase to the next. Nevertheless, the absolute change between phases one and two is substantially higher than the change between phases two and three. In particular, both EGI and II are below the mid-point (3, in a 1–5 scale) in phase one as expected, since these individuals have not made the decision nor formed meaningful plans to start a venture. EGI exhibits the highest absolute increase between phases one and two ($\Delta_{p2\text{-}p1} = 1.343$), as corresponds to the goal-setting decision (Rubicon crossing). In turn, II is the variable exhibiting the greatest increase from phases two to three ($\Delta_{p3\text{-}p2} = 0.656$), as plans are being developed in phase two whilst the advancement to phase three indicates its completion. Overall, these results are highly consistent with the predictions from APT.

5. Discussion

The present research makes significant contributions to the entrepreneurship field of research. Firstly, it contributes to the TPB by offering a dynamic view of the formation of entrepreneurial intentions throughout the entrepreneurial process. It shows that EGIs are often reevaluated as the person progresses through the process (Krueger, 2009), and the relative contribution of the motivational antecedents changes at each stage. The original TPB (Ajzen, 1991) focussed on relatively simple behaviour. A whole new avenue for research is opened here for the analysis of TPB relationships and dynamics in complex and long-term goals.

Even if all the antecedents of EGI are relevant (significant), the balance shifts from what we could call "eagerness for knowledge and skills" (PBC as the strongest predictor) during the

				Levene's test		ANOVA		Phases		Mean diff	Sig
	Phase	Mean	SD	F	Sig	F	Sig				
ATE	1	4.080	0.770	2.673	0.069[a]	175.590	0.000[b]	1	2	−0.713	0.000***
	2	4.793	0.814					1	3	−0.645	0.000***
	3	4.725	0.723					2	3	0.068	0.241 ns
PBC	1	3.249	0.729	17.478	0.000[a]	137.675	0.000[b]	1	2	−0.478	0.000***
	2	3.727	0.584					1	3	−0.607	0.000***
	3	3.857	0.644					2	3	−0.130	0.017**
SNs	1	3.522	0.736	7.229	0.001[a]	123.870	0.000[b]	1	2	−0.416	0.000***
	2	3.938	0.687					1	3	−0.694	0.000***
	3	4.216	0.685					2	3	−0.278	0.000***
EGI	1	2.786	0.914	30.764	0.000[a]	698.566	0.000[b]	1	2	−1.343	0.000***
	2	4.129	0.679					1	3	−1.633	0.000***
	3	4.419	0.692					2	3	−0.290	0.000***
II	1	2.293	0.993	66.463	0.000[a]	584.230	0.000[b]	1	2	−1.146	0.000***
	2	3.439	0.731					1	3	−1.802	0.000***
	3	4.095	0.659					2	3	−0.656	0.000***

Note(s): The mean values have been calculated using the relative weights of the items
[a] $p < 0.01$, equal variances cannot be sustained (Tamhane test used). DMS test was used for ATE
[b] $p < 0.001$ There are differences between the means of the different phases
***$p < 0.001$; **$p < 0.05$; ns = not significant
$N = 939$ (Phase 1); $N = 573$ (Phase 2); $N = 263$ (Phase 3)
Source(s): Authors' own work

Table 6.
Mean value comparison per phase

deliberative and planning phases (Kwong and Thompson, 2016; Rae and Woodier, 2006) to a "need for motivation and encouragement" (with ATE as the strongest predictor) when action is initiated in phase three (Varamäki *et al.*, 2016). Gielnik *et al.* (2020) find that self-efficacy levels and variability explain successful venture creation attempts. From our perspective, self-efficacy should be especially relevant in forming EGI and in its maintenance during the planning stage. In turn, the stronger effect of ATE during the acting phase could be related to legitimation and identity development (Malmström and Öqvist, 2021). Identity construction could play an important part in successfully paving the way towards starting the new venture (Prasastyoga *et al.*, 2021).

Our results help to explain certain conflicts found in the literature. The relative importance of ATE has been found to be higher in samples closer to the nascency stage, in line with our results: these include researchers from applied sciences in universities with active start-up promotion policies (Blaese and Liebig, 2021) and those from industrial research centres (Urban and Chantson, 2019). In contrast, PBC is a more important predictor of EGI in student samples, who are mostly in the pre-decisional stage (Feola *et al.*, 2019; Ndofirepi, 2022), as our results predict.

In the case of SNs, their direct effect on EGIs is stronger in phases one and three, whilst it is non-significant in phase two (potential entrepreneurs). Thus, samples made up of potential entrepreneurs should find this relation to be non-significant (Goethner *et al.*, 2012 regarding researchers in general; Lee-Ross, 2017 for final-year MBA students). In contrast, in samples mostly made up of nascent entrepreneurs or undecided individuals (e.g. students) a significant relationship could be expected (Kautonen *et al.*, 2013, 2015; Feola *et al.*, 2019; Blaese and Liebig, 2021; Ndofirepi, 2022). Nevertheless, given that SNs reflect the environmental influence (Santos *et al.*, 2016), this effect may be highly dependent on the cultural context.

Our post-hoc analysis confirms that the levels of both EGI and II grow as the individual advances to each subsequent stage. Regarding the EGI-II relationship, though, it is weaker in phase two, reflecting the implemental mindset in this phase. Since the decision to start up has just been made (the crossing of the Rubicon), attention is now focussed on the details that may facilitate plan development (Gollwitzer, 2012). The individual collects information on what, how and when to do the different tasks involved, with little re-evaluation of the goal. For this reason, goal strength becomes less relevant in affecting II. Still, though, other circumstances (e.g. an attractive job offer) may force EGI abandonment and lead to stopping planning.

In turn, this EGI-II relation is stronger in phase three, indicating that the alignment between goal (EGI) and plan (II) is critical during nascency (Gollwitzer, 1993; Van Gelderen *et al.*, 2018). When starting to perform startup behaviours, EGI is often reevaluated and the plan needs to be adapted accordingly. Thus, any change in the EGI level (e.g. after negative feedback from relevant stakeholders) will strongly affect plan refinement (II). This is consistent with Van Gelderen *et al.* (2018), who analysed a sample of nascent entrepreneurs.

This work contributes to the APT by providing a theory-based justification for the mechanism explaining changes in EGI strength during the volitional (second and third) phases. In this respect, the hierarchy of goals is relevant. Starting up represents a superordinate goal and several subordinate goals depend thereon (Gollwitzer, 1990). Entrepreneurial goals involve hierarchies of several single tasks undertaken in specific situational contexts (Van Gelderen *et al.*, 2018) involving deadlines or windows of opportunity (Bolzani *et al.*, 2021). The APT would also be applicable to those subordinate goals. The accomplishment of each individual task leads to an evaluative phase reflecting on this completion. This temporary shift to the deliberative mindset within the volitional phases has been termed as "action crises" (Ivanova and Tornikoski, 2022).

These outbreaks of deliberative periods would influence the motivational antecedents and, through such antecedents, would also influence the EGI. This iterative process may

make the individual draw the conclusion that the superordinate goal is not as desirable (ATE) or feasible (PBC) as expected, and the EGI strength may diminish or even disappear (the goal is abandoned). Alternatively, it may reinforce the conclusion that the superordinate goal is worthy and may boost the EGI strength. Both the reinforcing/demotivating effect of subordinate task evaluation and perseverance during goal striving represent highly interesting avenues for future research (Van Gelderen, 2021).

5.1 Implications

The results from this study have significant implications for academics and practitioners. From a research perspective, this study prompts a number of most pertinent research questions. Firstly, the way EGIs are formed may affect the likelihood of the start-up being successful. Our study model seems to identify an optimal mode of progressing throughout the phases (by developing high PBC first and maintaining a high ATE when action is initiated). However, certain individuals may cross the Rubicon (Delanoë-Gueguen and Fayolle, 2019; Heckhausen and Gollwitzer, 1987) led by their favourable ATE, without a sufficiently strong PBC. These "ill-formed" EGIs may be less likely to lead to actual behaviour. When confronted with planning (phase two) or acting (phase three), these individuals could find the tasks involved to be more complex than they had anticipated and may therefore give up. Alternatively, nascent entrepreneurs without a sufficiently positive ATE may feel a lack of both support and encouragement during nascency (phase three) and may become demotivated and abandon the venture.

Potential entrepreneurs driven by PBC may be better at planning. Likewise, those driven by ATE would develop less detailed plans. Since the importance of planning has been widely confirmed (Delanoë-Gueguen and Fayolle, 2019; Gielnik *et al.*, 2014; Van Gelderen *et al.*, 2018), those who are driven by ATE during phase two may be less likely to successfully complete the start-up process.

Secondly, the specific combination of EGI and II and their relationship deserves further research. Van Gelderen *et al.* (2018) propose a mediated moderation. In turn, alternative specifications could be tested, such as a full mediation (EGI→II→Action) or a partial mediation. Our results confirm the strong relationship between EGI and II and suggest that II is developed subsequent to EGI.

The implications for practitioners and support bodies are also highly relevant. Overall, our findings are consistent with best practices in entrepreneurship policies. If support programmes or initiatives are offered to the general population (mostly undecided), they should focus on strengthening self-efficacy perceptions (PBC). This could be the case for compulsory courses on entrepreneurship education (Fayolle and Gailly, 2015; Nabi *et al.*, 2017), programs for the unemployed and awareness-raising campaigns. The individuals' practical knowledge and skills could be critical in their decision to pursue this career option (provided their ATE is also favourable). A similar approach could be followed regarding potential entrepreneurs (in phase two), although one could expect them to already have relatively favourable PBC and ATE.

In turn, in programs for nascent entrepreneurs (phase 3), emotional support becomes a key element to overcome the subsequent obstacles they are likely to encounter. In this respect, it is not surprising that mentoring programs tend to be highly successful in developing affective goals and resilience (St-Jean and Audet, 2012). Helping individuals build their entrepreneurial self-identity could be essential for successful start-up completion (Malmström and Öqvist, 2021).

5.2 Limitations

This study, like any other, suffers from certain limitations. Firstly, the sample is made up of adults in Spain. The results should be extrapolated with caution since there is evidence of

cultural influences on the TPB relationships (Liñán and Chen, 2009; Moriano *et al.*, 2012). Likewise, the age structure and other socio-demographic characteristics of the sample might have affected the results. Similar studies should be carried out in alternative subsamples of the adult population and also in developed and developing countries and more recent data should be employed in order to confirm or refute these results.

Secondly, the data is cross-sectional. Longitudinal studies in which the respondents could be followed up during their start-up process would be preferable (Lévesque and Stephan, 2020). Nevertheless, our focus is on the comparison of the configuration of TPB variables and relationships in each APT phase. To this end, our research design appears to be suitable. In the future, however, a follow-up of these individuals could prove highly useful in ascertaining which specific configurations of EGI and II are more likely to lead to a successful start-up (Meoli *et al.*, 2020).

6. Conclusion

This paper has integrated two well-known and widely used theories from social psychology to analyse the start-up process: the APT and the TPB. The results provide substantial support for the proposed hypotheses. EGIs are formed differently in each stage (undecided, potential and nascent) of the entrepreneurial process. Implementation intentions, in turn, are mostly developed during phase two as a consequence of EGIs.

This study contributes to the literature by showing that the TPB antecedents play various roles and have varying importance in the formation and maintenance of the EGI and the II throughout the start-up process, depending on the phase in which the individual is situated. PBC is the most influential variable in explaining EGI for undecided and potential entrepreneurs, whilst ATE perceptions contribute the most to EGI for those in the nascent stage. Furthermore, we find SN is especially important to make the initial decision (phase one) and to build up the venture (phase three). Overall, these results contribute towards a deeper comprehension of starting up as a dynamic process throughout which EGI and II vary.

These results open up a number of very interesting research avenues that may contribute towards a more thorough understanding of the development of goal strength and planning throughout each start-up stage. The influence of specific combinations of II, EGI, and its antecedents on the key milestones throughout the different phases (making the decision, developing plans, initiating actions, starting up the venture and abandoning the project) is undoubtedly relevant. It may be of great consequence to ascertain which combinations of TPB antecedents are most effective at each stage in helping individuals advance towards successful venture creation. Similarly, how to best cater to each need (specific and differential) of individuals in each stage also deserves attention. We call for future research to consider these and other related questions derived from this approach.

Notes

1. We acknowledge that a non-trivial proportion of new entrepreneurs may not adhere to these stages in their entrepreneurial process (e.g. the "accidental entrepreneur", Shah and Tripsas, 2007). Nevertheless, there is strong evidence in the literature to justify that this is the most common and frequent path (see Note 2).
2. This is obviously a simplification of the alternative paths an entrepreneur may follow, but one that is useful and is frequently used in research (Davidsson and Gruenhagen, 2021; Kariv *et al.*, 2023; Lichtenstein *et al.*, 2006, 2007).
3. We ran the same model without control variables and the results were essentially the same (available upon request). Therefore, there is no evidence that these control variables have modified the hypothesised relationships, and hence they are no longer reported.
4. The MICOM analysis is included in the supplementary file.

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Supplementary file
Additional information about the statistical analysis.

Sample size:
The sample size for each phase is large enough to derive meaningful results (Hair *et al.*, 2017). The minimum sampling size required for the measurement of the medium-sized effects between the variables would be 145 cases (with an 80% confidence level and a 1% error level, a maximum of 3 predictors and a minimum R^2 of 10%). Given that the size of all three subsamples amply exceeds 145 cases, they are acceptable for the purposes of this study. The profile of the respondents is outlined in Table 1 in the manuscript.

	Fornell–Larcker criterion				Heterotrait–Monotrait ratio criterion			
Constructs	PBC	SNs	EI	II	PBC	SNs	EI	II
PBC	*0.792*							
SNs	0.371	*0.898*			0.422			
EI	0.587	0.450	*0.938*		0.646	0.497		
II	0.569	0.412	0.744	*0.936*	0.631	0.456	0.798	

Note(s): The square roots of AVEs are shown diagonally in italic
Source(s): Authors' own work

Table S1.
Discriminant validity

Constructs	R^2	Q^2	f^2
ATE	0.100	0.027	
SNs			0.112
PBC	0.137	0.084	
SNs			*0.160*
EI	0.455	0.397	
ATE			0.090
SNs			0.068
PBC			*0.282*
II	0.568	0.495	
EI			*0.429*

Source(s): Authors' own work

Table S2.
Model fit statistics

Table S3.
Results of invariance measurement testing using permutation (Phase 1/Phase 2)

	Step 1	Step 2			Step 3a			Step 3b			
		Compositional invariance			Equal variance assessment			Equal means assessment			
Constructs	Configural invariance	Original correlation	5%	Partial measurement invariance established	Variance – original difference (HT-MT)	95% confidence interval	Equal	Mean – original difference (HT-MT)	95% confidence interval	Equal	Full measurement invariance established
SNs	Yes	1	0.999	Yes	0.143	[−0.167; 0.174]	Yes	−0.562	[−0.102; 0.104]	No	No
ATE	Yes	0.952	0.924	Yes	0.304	[−0.168; 0.166]	No	−0.553	[−0.101; 0.107]	No	No
PBC	Yes	0.999	0.999	Yes	0.447	[−0.154; 0.159]	No	−0.661	[−0.099; 0.106]	No	No
EI	Yes	1	1	Yes	0.600	[−0.121; 0.126]	No	−1.273	[−0.103; 0.105]	No	No
II	Yes	1	1	Yes	0.620	[−0.108; 0.109]	No	−1.083	[−0.105; 0.103]	No	No
Age	Yes	1	1	Yes	−0.393	[−0.244; 0.258]	No	−0.230	[−0.099; 0.103]	No	No
Sex	Yes	1	1	Yes	−0.037	[−0.018; 0.024]	No	0.258	[−0.103; 0.100]	No	No
Self-E Exp	Yes	1	1	Yes	−0.536	[−0.192; 0.196]	No	−0.298	[−0.104; 0.099]	No	No
Educ. Level	Yes	1	1	Yes	−0.289	[−0.114; 0.115]	No	0.144	[−0.103; 0.101]	No	No

Source(s): Authors' own work

Table S4. Results of invariance measurement testing using permutation (Phase 2/Phase 3)

	Step 1	Step 2			Step 3a			Step 3b			
		Compositional invariance			Equal variance assessment			Equal means assessment			
Constructs	Configural invariance	Original correlation	5%	Partial measurement invariance established	Variance – original difference (HT-MT)	95% confidence interval	Equal	Mean – original difference (HT-MT)	95% confidence interval	Equal	Full measurement invariance established
SNs	Yes	1	0.995	Yes	0.003	[−0.244; 0.250]	Yes	−0.395	[−0.146; 0.148]	No	No
ATE	Yes	0.923	0.897	Yes	−0.181	[−0.249; 0.277]	Yes	−0.179	[−0.144; 0.146]	No	No
PBC	Yes	0.997	0.994	Yes	−0.173	[−0.220; 0.236]	Yes	−0.248	[−0.149; 0.144]	No	No
EI	Yes	1	0.999	Yes	−0.048	[−0.227; 0.258]	Yes	−0.412	[−0.150; 0.154]	No	No
II	Yes	0.999	0.998	Yes	0.186	[−0.219; 0.237]	Yes	−0.814	[−0.152; 0.149]	No	No
Age	Yes	1	1	Yes	−0.429	[−0.279; 0.298]	No	−0.348	[−0.157; 0.143]	No	No
Sex	Yes	1	1	Yes	0.006	[−0.012; 0.029]	Yes	0.038	[−0.140; 0.149]	Yes	No
Self-E Exp	Yes	1	1	Yes	−0.370	[−0.115; 0.134]	No	−0.568	[−0.146; 0.144]	No	No
Educ. Level	Yes	1	1	Yes	−0.380	[−0.169; 0.187]	No	0.306	[−0.144; 0.144]	No	No

Source(s): Authors' own work

Table S5.
Results of invariance measurement testing using permutation (Phase 1/Phase 3)

	Step 1	Step 2			Step 3a			Step 3b			
		Compositional invariance			Equal variance assessment			Equal means assessment			
Constructs	Configural invariance	Original correlation	5%	Partial measurement invariance established	Variance – original difference (HT-MT)	95% confidence interval	Equal	Mean – original difference (HT-MT)	95% confidence interval	Equal	Full measurement invariance established
SNs	Yes	1	0.999	Yes	0.145	[−0.202; 0.219]	Yes	−0.891	[−0.142; 0.141]	No	No
ATE	Yes	0.921	0.883	Yes	0.108	[−0.215; 0.225]	Yes	−0.670	[−0.135; 0.141]	No	No
PBC	Yes	0.999	0.999	Yes	0.266	[−0.191; 0.212]	No	−0.822	[−0.140; 0.141]	No	No
EI	Yes	1	1	Yes	0.553	[−0.148; 0.166]	No	−1.481	[−0.136; 0.129]	No	No
II	Yes	0.999	1	No	0.814	[−0.132; 0.139]	No	−1.507	[−0.135; 0.128]	No	No
Age	Yes	1	0.883	Yes	−0.821	[−0.284; 0.303]	No	−0.612	[−0.134; 0.132]	No	No
Sex	Yes	1	1	Yes	−0.031	[−0.027; 0.052]	No	0.297	[−0.145; 0.140]	No	No
Self-E Exp	Yes	1	1	Yes	−0.906	[−0.186; 0.240]	No	−0.932	[−0.133; 0.138]	No	No
Educ. Level	Yes	1	1	Yes	−0.669	[−0.174; 0.173]	No	0.478	[−0.130; 0.134]	No	No

Source(s): Authors' own work