



Determinants of Entrepreneurial Intent: A Meta-Analytic Test and Integration of Competing Models

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Increasing interest in the development of entrepreneurial intentions has elevated the importance of theories that predict and explain individuals' propensity to start a firm. The purpose of this study is to meta-analytically test and integrate the theory of planned behavior and the entrepreneurial event model. We summarize the findings of 98 studies (123 samples, $n = 114,007$) and utilize meta-analytic structural equation modeling to examine the empirical fit of the competing theories and the integrated model. Our results demonstrate support for the competing theories and indicate the moderating role of contextual boundary conditions in the development of entrepreneurial intent. Furthermore, our findings suggest that the integrated model provides additional explanatory power and a fuller understanding of the process through which entrepreneurial intent develops.

Introduction

Since the seminal articles by Shapero (1975), Shapero and Sokol (1982), Bird (1988), as well as Katz and Gartner (1988), a large and still growing number of studies have focused on entrepreneurial intent (hereafter EI). In an effort to enhance our knowledge of EI, prior research has suggested and empirically examined the effects of a large number of determinants on EI, utilizing a variety of theoretical frameworks to explain why some individuals are more entrepreneurial than others. The emergence of these theoretically derived approaches has also led to a large number of alternative models and extensions. There has been growing concern about the sometimes inconclusive empirical findings of the relationship between EI and its determinants (Krueger, 2009; Shook, Priem, & McGee, 2003). Shook et al. have reviewed the literature and concluded that the field is fragmented and lacks theoretical clarity and empirical precision, and they encouraged future research to integrate competing models of EI to reduce the number of alternative intention models. The theoretical integration of competing models by specifying their own contributions to the developmental process may enhance the explanatory power, consistency, and, in particular, theoretical clarity.

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The objective of this study is threefold: First, we meta-analytically test and compare the theory of planned behavior (TPB; Ajzen, 1991) and the entrepreneurial event model (EEM; Shapero & Sokol, 1982), the two most extensively tested competing theories that have been used to explain EI (Shook et al., 2003; Solesvik, Westhead, Kolvereid, & Matlay, 2012). Through a meta-analytic review of the determinants that have been identified to influence EI, we respond to calls for a more systematic aggregation and evaluation of the cumulative evidence in the entrepreneurship literature (Frese, Bausch, Schmidt, Rauch, & Kabst, 2012; Rauch & Frese, 2006; Shook et al.). Using an evidence-based approach, we extend the pioneering work by Krueger, Reilly, and Carsrud (2000), who have been the first to compare and integrate the extant theories of EI. Thus, the first contribution of our meta-analysis lies in the systematic overview of the empirical evidence on the determinants of EI, the identification and theoretical explanation of points of uncertainty in previous findings, and practical guidance for researchers regarding the usefulness of the competing theories and their respective constructs. Second, we explore contextual and methodological moderators of the relationships between EI and its determinants. Prior research has primarily focused on parallel predictors of EI, and researchers have not comprehensively tested the boundary conditions for each of the competing theories. Recent calls (Carsrud & Brännback, 2011; Moriano, Gorgievski, Laguna, Stephan, & Zarafshani, 2012; Shook et al.) suggest that to understand the direct effects of the identified determinants, studies should examine potential moderating effects of contextual factors. Prior literature also suggests that researchers' methodological decision may moderate the relationship between EI and its antecedents (Heuer & Liñán, 2013). The meta-analytic procedure allows us to explore whether differences across studies are due to contextual or methodological moderators, while the test of these types of moderators is seldom possible in primary research studies. In this way, we contribute to the existing literature by improving our understanding of the factors that influence the development of EI, which is important to better understand the relationship between individuals' perceptions, attitudes, and intentions. Finally, the third purpose of this study is to examine the specific mechanism that underlies the formation of EI. The literature has primarily focused on direct relationships between EI and its determinants. Thus, currently little is known about how beliefs, attitudes, and perceptions influence each other and cause individuals to hold more positive intentions toward starting a business. Based on the model of goal-directed behavior (MGB; Perugini & Bagozzi, 2001) and the extended MGB (Perugini & Conner, 2000), we integrate the TPB and the EEM, test this integrated model of EI using meta-analytic structural equation modeling, and compare the results with the two competing theories in terms of their predictive validity. By examining the mechanism through which specific determinants are associated with EI, we provide a more complete and more detailed picture of the process from whence positive perceptions and higher levels of EI arise. In doing so, we respond to Shook et al.'s call for an integration of different theories in order to reduce the number of alternative EI models. Therefore, our third main contribution lies in the integration of the TPB and the EEM and identification of the mechanism through which perceptions and EI develop.

Theoretical Background and Hypotheses

Theoretical Models of EI

The entrepreneurship literature has made significant efforts to explain how and why new ventures originate and, as a result, made valuable theoretical and empirical contributions to our understanding of the early stage of the entrepreneurial process. The creation

of one's own venture involves careful planning and thinking on the part of the individual, which makes entrepreneurship a deliberate and planned intentional behavior (Bird, 1988) and consequently applicable for intention models (Krueger, 1993). Across a wide range of different behaviors, behavioral intentions have been identified as the most immediate predictor of actual behavior (Ajzen, 1991). Entrepreneurial intentions are central to understanding entrepreneurship as they are the first step in the process of discovering, creating, and exploiting opportunities (Gartner, Shaver, Gatewood, & Katz, 1994). EI refers to the intention of an individual to start a new business (Krueger, 2009). In the past decades, several models have been proposed that explain the formation of EI (Krueger, 2009; Shook et al., 2003). The EEM (in the literature also referred to as the entrepreneurial intention model or the Krueger-Shapero model) was one of the earliest models to predict EI (Krueger, 1993; Shapero, 1975; Shapero & Sokol, 1982). The TPB (Ajzen), a theory that has been widely applied as a frame of reference to explain and predict behavioral intentions in different research contexts, was introduced to the EI literature by Krueger and Carsrud (1993). Based on the EEM and the TPB, Krueger and Brazeal (1994) developed the entrepreneurial potential model, suggesting that both theories overlap to a certain extent. In an empirical test of the two competing theories, Krueger et al. (2000) have strongly emphasized the differences between the respective antecedents of the two models and included relationships between the more distal determinants of the TPB and the more proximal determinants of the EEM. Based on attitudes as well as on personal and situational characteristics, Davidsson (1995) proposed an additional model to examine EI. More recently, based on the model proposed by Krueger et al., Elfving, Brännback, and Carsrud (2009) developed complex extensions of the EEM and the TPB. Prior reviews of the literature (Krueger, 2009; Shook et al.) have shown that the existing empirical literature on the determinants of EI has tended to focus on the TPB and the EEM. In this meta-analysis, we focus on these two theories as they provide well-articulated theoretical frameworks that demonstrate strong explanatory power.

As presented in Figure 1, according to the TPB, individuals' intention is determined by attitude toward the behavior (hereafter ATB), subjective norm, and perceived behavioral control (hereafter PBC). ATB reflects an individual's awareness of the outcome of a behavior and the degree to which an individual has a favorable or unfavorable evaluation of performing the behavior (Ajzen, 1991). Subjective norms are the perceived normative beliefs about significant others, such as family, relatives, friends, as well as other important individuals and groups of individuals. The values and norms held by these individuals and the related social pressure to perform the behavior directly influence an

Figure 1

Theory of Planned Behavior

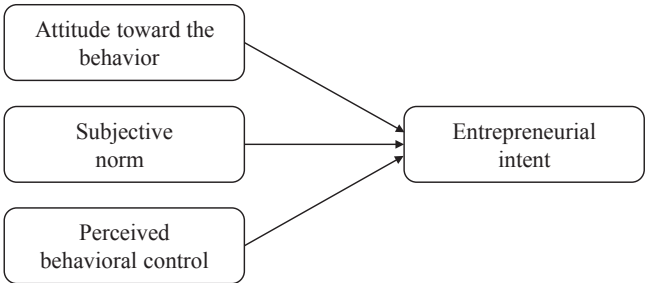
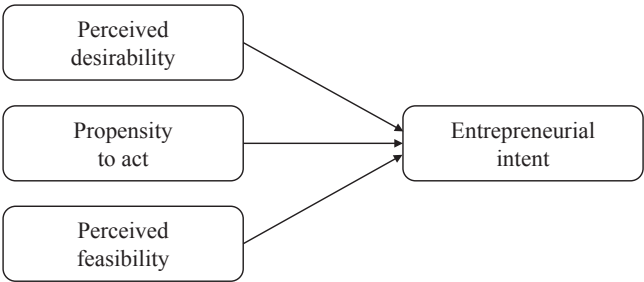


Figure 2

Entrepreneurial Event Model



individual’s intent to perform the behavior (Ajzen). PBC refers to an individual’s belief about being able to execute the planned behavior and the perception that the behavior is within the individual’s control (Ajzen).

As presented in Figure 2, according to the EEM, EI depends on perceived desirability, the propensity to act, and perceived feasibility. Perceived desirability refers to the degree to which an individual feels attracted to become an entrepreneur and reflects individual preferences for entrepreneurial behavior (Shapero & Sokol, 1982). An individual’s propensity to act upon opportunities refers to an individual’s disposition to act on one’s decision (Shapero & Sokol) and, in general, depends on an individual’s perception of control as well as a preference to acquire control by taking appropriate actions (Krueger et al., 2000). Shapero (1975) suggested that individuals with a high locus of control show an orientation to control events in their lives, while Krueger et al. propose learned optimism (Seligman, 1990) as an operationalization of the propensity to act. Perceived feasibility refers to the degree to which individuals are confident that they are personally able to start their own business and consider the possibility to become an entrepreneur as being feasible (Shapero & Sokol).

We identified 98 studies, conducted in more than 30 countries (primary data studies) during the past 25 years, which have examined the development of EI in terms of either one of the two theories or of an extension or combination of the two theories. Table 1 provides an overview of these studies (the literature search as well as the study selection and coding procedure are described in detail in the Methodology section).

The majority of the studies is published in journals (72%) and based on student samples (65%). The first step in comparing the empirical evidence of different theories is the comparison of the extent to which these theories have been studied (Becker, 2009). With 30 studies using all three determinants and 12 studies using two of the three determinants, the TPB is the dominating model in the empirical literature on EI. To the best of our knowledge, only one study examined all three determinants of the EEM, while 12 studies focused on the two main determinants (perceived desirability and perceived feasibility) of the EEM. In total, 17 studies examined models that combined at least one of the main determinants of the EEM and at least one of the determinants of the TPB. Among these, 10 studies focused on subjective norms and the main EEM determinants, six studies investigated entrepreneurial self-efficacy (hereafter ESE) together with the main EEM determinants, and three studies examined ATB and the main EEM determinants. Seven studies used the TPB and EEM variables as parallel predictors of EI, and 10 studies examined structural models. All of the structural models followed the conceptual

Table 1

Summary of Studies Included in the Meta-Analyses

Authors	k	N	Year	Publication	Respondent	Theory	Variables	Country
Abebe (2012)	1	186	2009	JA	S	TPB	SN	United States
Ali, Lu, and Wang (2012)	1	490	2011	JA	S	EEM	PD, PF	Mixed
Almohareek and Manolova (2012)	1	950	2010	JA	S	TPB/EEM	SN, PD, PF	Arab nations
Altınay, Madanoğlu, Daniele, and Lashley (2012)	1	205	2009	JA	S	TPB/EEM [†]	ATB, PA	United Kingdom
Ang and Hong (2000)	1	205	1997	JA	S	EEM [†]	PA	Mixed
Autio, Keeley, Klostien, Parker, and Hay (2001)	2	3,542	1998	JA	S	TPB	ATB, SN, PBC	Mixed
Basu (2010)	1	231	2005	JA	S	TPB	ATB, SN, PBC	United States
Borchers and Park (2010)	1	191	2006	JA	NS	EEM [†]	ESE, PA	United States
Brännback, Krueger, Carsrud, and Elfving (2007)	1	421	2003	CP	NS	EEM	PD, PF	Finland
Byabashajja and Katono (2011)	1	167	2007	JA	NS	EEM	ESE, PD, PF	Uganda
Carr and Sequeira (2007)	1	308	2004	JA	S	TPB	ATB, SN, ESE	United States
Chen, Greene, and Crick (1998)	1	315	1995	JA	S/NS	EEM [†]	ESE, PA	United States
Chowdhury, Shamsudin, and Ismail (2012)	1	101	2009	JA	S	TPB	ATB, SN, PBC	Various
Chulunbaatar, Ottavia, and Kung (2011)	1	361	2008	JA	S	EEM	PD, PF	Mixed
Criaco (2012)	1	16,783	2004	WP	NS	EEM	PD, PF	Mixed
De Clercq, Honig, and Martin (2013)	1	946	2008	JA	S	EEM	PD, PF	Canada
De Pillis and Reardon (2007)	2	206	2004	JA	S	TPB/EEM [†]	ATB, PA	Various
De Pillis and DeWitt (2008)	1	244	2005	JA	S	TPB/EEM [†]	ATB, PA	United States
Devonish, Alleyne, Charles-Soverall, Marshall, and Pounder (2010)	1	376	2007	JA	S	EEM	PD, PF	Barbados
Dohse and Walter (2010)	1	1,949	2007	WP	NS	TPB	ATB, SN, PBC	Germany
Dreman and Saleh (2008)	1	378	2005	WP	NS	TPB/EEM	SN, PD, PF	Bangladesh
Emin (2004)	1	744	2002	JA	S	TPB/EEM	SN, PD, PF	France
Engle et al. (2010)	14	1,748	2008	JA	S	TPB	ATB, SN, ESE	Various
Espiritu-Olmos and Sastre-Castillo (2012)	1	1,210	2009	JA	NS	EEM [†]	PA	Spain
Ferreira, Raposo, Rodrigues, Dinis, and do Paço (2012)	1	74	2009	JA	S	EEM [†]	PA	Portugal
Fini, Grimaldi, Marzocchi, and Sobrero (2009)	1	200	2007	CP	NS	TPB	ATB, SN, PBC	Italy
Fitzsimmons and Douglas (2011)	1	414	2004	JA	S	EEM	PD, PF	Mixed
Frank, Lueger, and Korunka (2007)	1	1,249	2004	JA	S	EEM [†]	PA	Austria
Garg, Matshediso, and Garg (2011)	1	127	2007	JA	S/NS	EEM [†]	PA	Botswana
Gird and Bagraim (2008)	1	227	2005	JA	S	TPB	ATB, SN, PBC, PA	South Africa
Godsey and Seborra (2010)	1	84	2005	JA	S	EEM	PD, PF	United States
Goethner, Obschonka, Silbereisen, and Cantner (2009)	1	402	2006	WP	NS	TPB	ATB, SN, PBC	Germany

Table 1

Continued

Authors	k	N	Year	Publication	Respondent	Theory	Variables	Country
Gökseel and Belgin (2011)	1	175	2008	JA	S	EEM [†]	PA	Turkey
Griffiths, Kickul, and Carsrud (2009)	1	1,473	2007	JA	S	EEM	PD, PF	Mixed
Grundstén (2004)	1	271	2001	DI	NS	TPB/EEM	SN, PD, PF	Finland
Gurel, Altınay, and Daniele (2010)	2	409	2007	JA	S	EEM [†]	PA	Various
Hack, Retberg, and Witt (2008)	1	111	2007	JA	S	TPB	SN, PBC	Germany
Hmieleski and Corbett (2006)	1	430	2003	JA	S	EEM [†]	ESE, PA	United States
Hulsink and Rauch (2010)	1	121	2007	CP	NS	TPB	ATB, SN, PBC	The Netherlands
Iakovleva, Kolvereid, and Stephan (2011)	1	2,225	2008	JA	S	TPB	ATB, SN, PBC	Mixed
Iakovleva and Kolvereid (2009)	1	317	2004	JA	S	EEM/TPB	ATB, SN, PBC, PD/PF	Russia
Izquierdo and Buelens (2011)	1	236	2005	JA	NS	TPB	ATB, ESE	France
Katono, Heintze, and Byabashajja (2010)	1	217	2007	CP	NS	TPB	ATB, SN, PBC	Uganda
Kautonen, Kibler, and Tornikoski (2010)	1	1,143	2009	JA	S	TPB	ATB, SN, PBC	Finland
Kennedy, Drennan, Renfrow, and Watson (2003)	1	1,034	2002	CP	S	TPB/EEM	SN, PD, PF	Australia
Kolvereid (1996)	1	128	1993	JA	S	TPB	ATB, SN, PBC	Norway
Kolvereid and Isaksen (2006)	1	297	2002	JA	S	TPB	ATB, SN, ESE	Norway
Kristiansen and Indarti (2004)	2	251	2002	JA	S	TPB/EEM [†]	ATB, ESE, PA	Various
Krueger (1993)	1	126	2003	CP	S	EEM	PD, PF, PA	United States
Krueger and Kickul (2006)	1	528	1990	JA	S	EEM	PD, PF	Mixed
Krueger et al. (2000)	1	97	1997	JA	S	TPB/EEM	ATB, SN, PD, PF	United States
Lefiel and Darling (2009)	2	86	2006	JA	S	TPB	ATB, SN, PBC	United States
Lepoutre, Tilleuil, and Crijns (2011)	1	2,160	2007	JA	NS	TPB/EEM	ATB, PD, PF	Belgium
Leroy, Maes, Sels, Debrulle, and Meuleman (2009)	1	423	2006	BC	NS	TPB	ATB, SN, PBC	Belgium
Liñán and Chen (2006)	2	533	2003	WP	NS	TPB	ATB, SN, PBC	Various
Lucas and Cooper (2012)	1	311	2009	CP	NS	TPB/EEM	ESE, PD, PF	United Kingdom
Lüthje and Franke (2003)	1	512	2000	JA	S	TPB/EEM [†]	ATB, SN, PA	United States
Mokhtar and Zaimuddin (2011)	1	138	2010	CP	NS	TPB/EEM [†]	ATB, SN, PBC, PA	Malaysia
Moriano et al. (2012)	6	1,074	2007	JA	S	TPB	ATB, SN, ESE	Various
Mueller (2011)	1	464	2005	JA	S	TPB	ATB, SN, PBC	Mixed
Mushiaq, Hunjra, Niazi, Rehman, and Azam (2011)	1	225	2008	JA	S	TPB/EEM	SN, PD, PF	Pakistan
Nistorescu and Ogarcă (2011)	1	62	2008	JA	S	TPB	ATB, ESE	Rumania
Nwankwo, Kanu, Marire, Balogun, and Uhiara (2012)	1	350	2009	JA	S	TPB	ESE	Nigeria

Oruoch (2006)	1	528	2004	JA	S/NS	TPB/EEM	SN, PD, PF	Kenya
Plant and Ren (2010)	1	181	2007	JA	S	TPB	SN, PBC	Mixed
Pruett, Shinnar, Toney, Llopis, and Fox (2009)	1	1,056	2006	JA	S	TPB	SN, ESE	Mixed
Rasheed and Rasheed (2003)	1	224	1999	JA	NS	EEM [†]	PA	United States
Rittippant, Kokchang, Vanichkripisan, and Chompoondang (2011)	1	1,500	2008	CP	NS	TPB/EEM	ATB, SN, PBC, PD, PF	Thailand
Sánchez, Lanero, Villanueva, D'Almeida, and Yurrebaso (2007)	1	907	2004	WP	NS	TPB/EEM [†]	ATB, ESE, PA	Spain
Santos and Liñán (2010)	1	816	2007	WP	NS	TPB	ATB, SN, PBC	Mixed
Scherer, Brodzinski, and Wiebe (1991)	1	337	1988	JA	S	TPB/EEM [†]	ATB, ESE, PA	United States
Schwarz, Wdowiak, Almer-Jarz, and Breitenecker (2009)	1	2,124	2005	JA	S	TPB	ATB, SN	Austria
Segal, Borgia, and Schoenfeld (2005)	1	115	2001	JA	S	TPB/EEM	ESE, PD, PA	United States
Shiri, Mohammadi, and Hosseini (2012)	1	100	2009	JA	S	TPB/EEM	SN, PD	Iran
Shook and Bratianu (2010)	1	302	2005	JA	S	TPB/EEM	SN, ESE, PD, PF	Romania
Solesvik (2013)	1	321	2010	JA	S	TPB	ATB, SN, PBC	Ukraine
Solesvik et al. (2012)	1	192	2007	JA	S	TPB/EEM	ATB, SN, ESE, PBC, PD, PF	Ukraine
Soutaris, Zerbinati, and Al-Laham (2007)	1	250	2002	JA	S	TPB	ATB, SN, PBC	Mixed
Thompson (2009)	1	131	2006	JA	S	EEM [†]	PA	Various
Thun and Kelloway (2006)	1	238	2003	JA	NS	TPB	SN, ESE	Canada
Tkachev and Kolvereid (1999)	1	512	1997	JA	S	TPB	ATB, SN, PBC	Russia
Urbig, Weitzel, Rosenkranz, and Witteloostuijn (2013)	1	111	2008	JA	NS	EEM	ESE	The Netherlands
Van Gelderen et al. (2008)	1	1,235	2005	JA	S	TPB	ATB, SN, PBC	The Netherlands
Van Praag (2011)	1	818	2007	BC	NS	EEM [†]	PA	The Netherlands
Varamäki, Tornikoski, Joensuu, Vijamaa, and Ristimäki (2011)	1	1,204	2010	CP	NS	TPB	ATB, SN, PBC	Finland
Vazquez, Naghiu, Gutierrez, Lanero, and Garcia (2009)	1	1,156	2008	CP	S	EEM	ESE, PD, PF	Spain
Wagner (2011)	2	313	2008	JA	S	TPB	ATB	Various
Wagner (2012)	1	129	2009	JA	S	TPB	ATB	Germany
Wang, Wong, and Lu (2002)	1	7,844	2000	BC	NS	TPB/EEM	ATB, ESE, PD, PF	Singapore
Wang, Lu, and Millington (2011)	1	399	2009	JA	S	EEM	PD, PF	Mixed
Wilson, Kieckul, and Marlino (2007)	1	933	2003	JA	S/NS	TPB	ESE	United States
Wurthmann (2013)	1	314	2010	JA	S	EEM	PD, PF	United States
Yan (2010)	1	207	2007	JA	S	EEM [†]	PA	United States
Yang, Hsiung, and Chen (2011)	1	270	2008	CP	NS	TPB	ATB, SN, ESE	Taiwan
Zali, Ebrahim, and Schott (2011)	1	32,050	2008	WP	NS	TPB	ESE	Mixed
Zapkau, Schwens, Steinmetz, and Kabst (2011)	1	372	2010	CP	NS	TPB	ATB, SN, PBC	Germany
Zellweger, Sieger, and Halter (2011)	1	5,363	2006	JA	S	EEM [†]	ESE, PA	Mixed
Zhang, Duysters, and Cloodt (2013)	1	494	2010	JA	S	EEM	PD, PF	China

Note: Studies with various countries provided individual country data, while studies with mixed data sets used a pooled data set including several countries. In the theory category all EEM marked with an [†] indicate those studies that used locus of control, which is assumed to be a measure of the propensity to act.

k, number of independent samples per study; *N*, total sample size per study; year, year of data collection; publication, publication type; BC, book chapter; CP, conference proceedings or conference presentation; DI, dissertation; JA, journal article; WP, working paper; S, student; NS, nonstudent; ATB, attitude toward the behavior; EI, entrepreneurial intent; ESE, entrepreneurial self-efficacy; SN, subjective norm; PBC, perceived behavioral control; PD, perceived desirability; PF, perceived feasibility; PA, propensity to act.

model proposed by Krueger (2000) and Krueger et al. (2000) and tested in particular the effect of subjective norm on perceived desirability and the effect of ESE on perceived feasibility. While four of the 10 studies examined the significance of the mediation role of the EEM determinants based on the comparison of direct and indirect paths, only one of these studies used statistical procedures to more formally test the mediation. To our knowledge, there is currently no empirical study that examines all six determinants that have been proposed in the EEM and the TPB together. The primary advantage of theory-driven meta-analysis is the possibility to assess structural models that have not been studied in primary studies before (Landis, 2013). In the following, we propose an integrated model of EI and use meta-analytic structural equation modeling to test this model.

An Integrated Model of EI

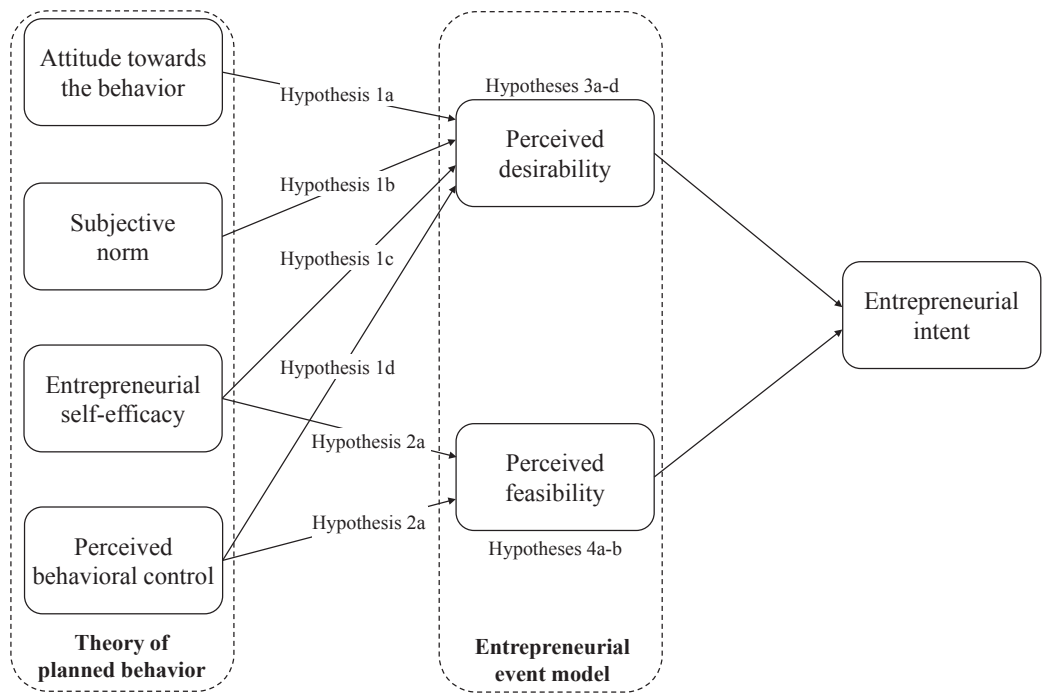
Prior research has argued that the TPB and the EEM overlap as in both models EI is explained by an individual's willingness and capability (Guerrero, Rialp, & Urbano, 2008; Krueger & Brazeal, 1994; Van Gelderen et al., 2008). In contrast, other researchers have emphasized that the TPB and EEM determinants are distinct constructs and proposed and empirically tested conceptual models that can be understood as partially integrated models (Krueger & Kickul, 2006; Krueger et al., 2000) and fully integrated models (Iakovleva & Kolvereid, 2009; Shook & Bratianu, 2010; Solesvik et al., 2012) of the EEM and the TPB. We build on this literature and the extended MGB (Perugini & Conner, 2000) to develop and meta-analytically test an integrated model of EI.

In the TPB, it is assumed that ATB, subjective norm, and PBC determine the intention to perform a behavior and that each of these determinants provides the motivational foundation for forming an intention. Bagozzi (1992) argued that the TPB does not describe the motivational process and how these predictors act in the formation of intention, since the TPB does not incorporate an explicit motivational component. Furthermore, Bagozzi proposed that an individual's desire to perform a behavior might function as a factor that mediates the relationship between attitudes and intention. Prior EI research in particular used this argument to integrate the TPB and the EEM (Iakovleva & Kolvereid, 2009).

In the context of EI, one potentially useful theory that extends the arguments by Bagozzi (1992) is the MGB (Perugini & Bagozzi, 2001), which proposes that the intention to perform a specific behavior is mainly motivated by the desire to perform this behavior and to achieve a specific goal. In turn, the desire mediates the influence of ATB, subjective norm, PBC, and anticipated emotions on intentions. In other words, the MGB describes a mechanism through which the three TPB antecedents influence intention. The current study will focus on the role of desire as a mediating variable for the effect of the original TPB determinants of EI. Desires are goal-related and can be defined as a mental state in which individuals' reasons to perform a behavior are transformed into their motivation to perform the behavior (Perugini & Bagozzi). In this way, desires provide the motivational basis for an intended goal-directed behavior (Perugini & Bagozzi) and are comparable with the perceived desirability construct in the EEM. Perugini and Conner (2000) extended the MGB (EMGB) by including goal desire as an antecedent of desire and goal perceived feasibility as an antecedent of PBC. A goal desire is positively related to the desire for a behavior as an individual desires a behavior because this behavior may ultimately result in the achievement of a goal that the individual desires (Perugini & Conner). To our knowledge, no empirical study directly examined the relationship between goal desires and EI. However, several studies (e.g., Engle et al., 2010) operationalized ATB in terms of variables, such as autonomy and wealth, which can be

Figure 3

An Integrated Model of Entrepreneurial Intent



viewed as goal desires in the entrepreneurship context. Consequently, while we cannot include goal desires directly in an integrated model of EI, they are reflected to some extent in the ATB. Goal perceived feasibility refers to the perceived feasibility of achieving the goal (Perugini & Conner). In sum, the EMGB includes the TPB determinants, a construct that is conceptually close to perceived desirability in the EEM, and offers with goal perceived feasibility the potential to broaden the EMGB’s scope by including perceived feasibility, the second main determinant in the EEM. Therefore, the EMGB provides a suitable conceptual framework to integrate the TPB and the EEM. Figure 3 presents the relationships in our integrated model of EI. In the following, we provide the theoretical arguments for this conceptual model.

Attitude, Subjective Norm, PBC, and Perceived Desirability. The potential influence of ATB as well as subjective norm on the perceived desirability to found one’s own business have been explicitly or implicitly discussed in the literature since the pioneering work of Shapero and Sokol (1982) and the more formal conceptualization by Krueger (2000). As described above, in the entrepreneurship context, ATB reflects individuals’ beliefs that starting one’s own business leads to certain outcomes and their evaluation of those outcomes. Perceived desirability is the degree to which individuals find the prospect of starting a business attractive and would be represented by the desire to perform a behavior to achieve a goal within the EMGB. Applying the arguments of the EMGB, an increase in an individual’s ATB should have a positive influence on the individual’s desire to perform those behaviors that are related to founding one’s own firm and to achieve the goal to

become an entrepreneur. Perceived desirability functions as the motivational factor that transforms a favorable attitude into EI. Positive attitudes toward entrepreneurship will positively affect the personal attractiveness of starting one's own business as more favorable attitudes justify more favorable perceptions of desirability of the behaviors related to the goal of becoming an entrepreneur. Therefore:

Hypothesis 1a: ATB is positively related to perceived desirability.

Hypothesis 3a: The relationship between ATB and EI is mediated by perceived desirability.

Along the same line of arguments, we propose that subjective norm affects perceived desirability. Subjective norm includes the perceived expectations of relevant people or groups that influence the individual in carrying out the target behavior (i.e., social pressure, family wishes, and friends' wishes). The influence of relevant others operates by its influence on perceptions of desirability (Krueger, 2000). An individual's perception of relevant people's positive expectations about the start of an own venture by this individual will encourage this individual to form favorable perceptions of desirability with regard to the behaviors that are necessary to achieve the goal to become an entrepreneur. Negative expectations and, therefore, negative social pressure, will create unfavorable perceptions of desirability of these behaviors. While subjective norms do not in and of themselves contain the motivation to act, more positive subjective norms increase the perceived desirability of the specific related behaviors. Thus:

Hypothesis 1b: Subjective norm is positively related to perceived desirability.

Hypothesis 3b: The relationship between subjective norm and EI is mediated by perceived desirability.

One of the most discussed topics in the TPB literature is whether PBC and ESE are distinct constructs. While the earlier literature has argued that the two constructs are very similar (Ajzen, 1991), more recent research has emphasized that PBC and self-efficacy are related but distinct constructs (Ajzen, 2002; Conner & Armitage, 1998). Furthermore, Ajzen (2002) proposed that self-efficacy (internal control) and controllability (external control) together form the higher order factor PBC. The ambiguity related to PBC and ESE resulted in the interchangeable use of the constructs in the EI literature. As presented above in Table 1, empirical studies that examined EI used both ESE and PBC. Therefore, we will examine the distinct effects of the two constructs on EI in the current study. Self-efficacy is the extent to which individuals believe in the ability to execute a behavior and what they believe is possible with the skills they possess (Bandura, 1997). ESE refers to individuals' beliefs in their ability to successfully start a company (McGee, Peterson, Mueller, & Sequeira, 2009). PBC can be defined as the perceived control over the performance of a particular behavior (Ajzen, 2002). In the context of entrepreneurship, PBC reflects individuals' beliefs about their control of the potential outcomes of becoming an entrepreneur and the capability to overcome potential external constraints in this process. Within the conceptual framework of the EMGB, both ESE and PBC should have a positive effect on the desire to perform those behaviors that are useful to achieve the goal of starting one's own venture. Individuals who have more confidence in their skills and abilities to start their own business and who perceive that the outcomes of their behavior are under their control should have more desire to perform the behaviors that are related to entrepreneurship than those individuals that lack the skills, abilities, and control. Thus:

Hypothesis 1c: ESE is positively related to perceived desirability.

Hypothesis 3c: The relationship between ESE and EI is mediated by perceived desirability.

Hypothesis 1d: PBC is positively related to perceived desirability.

Hypothesis 3d: The relationship between PBC and EI is mediated by perceived desirability.

PBC, ESE, and Perceived Feasibility. While some researchers have argued that PBC, ESE, and perceived feasibility are similar constructs (e.g., Guerrero et al., 2008), other researchers have pointed out that they are distinct constructs and that in particular ESE has a positive influence on perceived feasibility (Elfving et al., 2009; Krueger, 2000; Krueger & Day, 2010; Shapero & Sokol, 1982). The lack of consistency in the operationalization of PBC and ESE also resulted in the use of the two constructs as measures of perceived feasibility. In the EI context, perceived feasibility has been defined as individuals' perception of feasible future states that are related to the creation of a new venture (Shapero & Sokol). Compared with PBC and ESE, perceived feasibility refers less to the degree to which individuals consider the internal and external factors to start their own business and more to the feasibility of the behaviors that are necessary to achieve the goal of becoming an entrepreneur. When understood in this way and applied in the conceptual framework of the EMGB, perceived feasibility forms a second motivational component alongside with perceived desirability that transforms perceptions of internal and external control into EI. It is important to note that perceived feasibility is distinct from goal perceived feasibility in the EMGB as the latter refers to the feasibility of the goal whereas perceived feasibility refers to the feasibility of the behaviors to achieve this goal. We extend the EMGB by a motivational component that affects behavioral intentions as a parallel predictor of desires (perceived desirability in our model). In the same way as goal desires affect desires in the EMGB, ESE and PBC affect perceived feasibility in our integrated model of EI. Individuals with higher ESE and higher PBC should have a higher perceived feasibility of the behaviors that are related to entrepreneurship. Higher perceptions of internal and external control broaden individuals' range of what they perceive as feasible and, as a result, increase the set of feasible alternatives (Krueger, 2000). Therefore:

Hypothesis 2a: ESE is positively related to perceived feasibility.

Hypothesis 4a: The relationship between ESE and EI is mediated by perceived feasibility.

Hypothesis 2b: PBC is positively related to perceived feasibility.

Hypothesis 4b: The relationship between PBC and EI is mediated by perceived feasibility.

Methodology

Literature Search

Given the fragmented and interdisciplinary nature of EI research, meta-analysis has been suggested as a research tool for integrating research results as well as for testing, integrating, and developing theory in entrepreneurship research (Frese et al., 2012; Rauch & Frese, 2006).

To identify a sample of published and unpublished studies that empirically examined the relationships between EI and its antecedents, we used six complementary steps in our literature search. First, we consulted review articles (Krueger, 2009; Kuehn, 2008; Shook

et al., 2003) and previous meta-analyses (Haus, Steinmetz, Isidor, & Kabst, 2013; Martin, McNally, & Kay, 2013; Zhao, Seibert, & Lumpkin, 2010). Second, we examined several electronic databases (ABI/INFORM Global, EBSCO, Science Direct, ProQuest, and Business Source Premier) looking for entries published between 1985 and 2012. We used variations and combinations of keywords to identify EI as well as its determinants according to the TPB and according to the EEM. Third, we manually searched relevant journals issue-by-issue. In addition, a manual search of in-press articles in these journals was conducted. We also searched relevant conference programs and proceedings. Fourth, we conducted an unstructured search (Cooper, 1998) using Google, Google Scholar, and Microsoft Academic Search in an effort to identify unpublished studies. Fifth, requests were posted on electronic list servers to elicit in particular unpublished research to reduce publication bias (Rosenthal, 1995). Finally, we searched all studies citing the articles revealed in the previous steps (Cooper) using Google Scholar and Scopus and explored the reference lists of all articles for additional studies of relevance. This process was re-applied to the newly found studies until no more relevant literature could be identified. The literature search included English, German, French, and Spanish literature in an effort to reduce a potential language bias (Rothstein, Sutton, & Borenstein, 2005).

Inclusion Criteria and Coding Procedure

For inclusion in the meta-analysis, articles needed to be empirical and report correlation coefficients or provide information so that correlation coefficients could be calculated (Geyskens, Krishnan, Steenkamp, & Cunha, 2009; Lipsey & Wilson, 2001; Peterson & Brown, 2005). To maintain the assumption of independence among correlations (Hunter & Schmidt, 2004), we only included the articles that reported more information when several studies were based on the same data set. Moreover, we only included the results of the first point in time of longitudinal studies to ensure comparability with cross-sectional studies. Whenever studies reported results of different countries, we treated respective correlations as coming from different samples. The literature search and the use of the selection criteria resulted in a sample of 98 studies (123 independent samples, $n = 114,007$). A summary of all studies included in the meta-analyses is presented in Table 1.

The studies were coded independently by the two authors, and any discrepancies were discussed among the coders (Lipsey & Wilson, 2001). The inter-rater reliability analysis revealed an initial average agreement rate of 90% and a mean Cohen's kappa (Cohen, 1960) of .81, indicating a strong initial inter-rater reliability (Orwin & Vevea, 2009). Each study was coded for effect sizes, sample characteristics, contextual and methodological moderators, as well as the respective measurement construct reliability. At the measurement level, researchers have used different measures to operationalize EI and its determinants (Shook et al., 2003; Thompson, 2009). Therefore, in coding the data, we used the definition and measurement of variables rather than the names of the variables in the original studies and coded each variable accordingly.

In addition to the key constructs, we coded potential moderators of the various relationships. The proposed relationships for the TPB, the EEM, and the integrated model may be influenced by contextual and methodological moderators. According to the TPB (Ajzen, 1991) and the EEM (Shapero & Sokol, 1982), external factors, such as environmental characteristics, influence intentions only indirectly through their effect on the determinants of intentions and are not assumed to moderate the relationship between EI and its antecedents. Meta-analytic evidence (Cooke & Sheeran, 2004) suggests that moderation effects of external factors, such as certainty, add predictive validity beyond the

direct and mediated effect for the TPB. The studies included in the current meta-analysis have been conducted in different time periods and in different countries with different social, institutional, and cultural contexts. The countries and time periods sampled in these studies differ in terms of various attributes and aspects of the respective environment, such as the availability of resources, support, and opportunities. In the development of EI, individuals perceive their environment as more or less munificent and, as a result, are more or less certain about the beliefs and attitudes that influence their intentions to found an entrepreneurial venture (Kibler, 2013). Prior research (Brännback, Carsrud, Elfving, Kickul, & Krueger, 2006; Elfving et al., 2009; Krueger & Day, 2010) argues that, while the general EI model is a robust one, the variations in the research results might be a result of differences in the national context. There is little theoretical clarity how moderators influence the effects of different determinants on EI, and moderators have not been examined systematically across studies (Liñán, Rodríguez-Cohard, & Rueda-Cantuche, 2011; Moriano et al., 2012; Terjesen, Hessels, & Li, 2013). The results of previous empirical studies suggest that cross-country differences in national culture and institutional settings may moderate the relationships between EI and its determinants (Engle et al., 2010; Iakovleva et al., 2011; Moriano et al.). To address the moderating influence of differences in the national context on the relationship between EI and its determinants, we used a binary variable identifying studies that were conducted in Western countries (1) compared with non-Western countries (0). In an effort to explore potential time-dependence of the relationships between EI and its determinants, we coded the year of study. Following best-practice in the meta-analysis literature (Ellis, 2006), data collection was assumed to have taken place 3 years prior to the publication of each study unless otherwise stated. Previous research (Notani, 1998) has shown that in particular, three methodological moderators may affect the relationships between variables: (1) construct operationalization, (2) respondent type, and (3) publication status. To better determine the impact of different construct operationalizations, we included whether EI or its determinants have been measured using different measures. There is an ongoing debate about the use of student samples in empirical studies (McGee et al., 2009; Shook et al., 2003). The homogeneity and specific characteristics of student samples (i.e., age, education, and income) may affect the effect sizes. Consequently, we included respondent type (whether a study participant was a student or nonstudent) as a moderator variable. Finally, it has often been pointed out that published sources often report results that are statistically significant, resulting in a publication bias whereby reported studies differ from other studies (Rosenthal, 1979; Rothstein et al., 2005). Recent methodological studies disagree whether or not publication bias influences meta-analytic results (Dalton, Aguinis, Dalton, Bosco, & Pierce, 2012; Kepes, Banks, McDaniel, & Whetzel, 2012). Therefore, we included publication status (whether a study has been published in a journal or not) as potential moderator.

Analytic Procedures

Bivariate Meta-Analysis. We used Hunter and Schmidt's (2004) meta-analytic procedure, which allows for correction of sampling error and measurement error. We followed the recommendations for meta-analytic procedures by Geyskens et al. (2009). We corrected for measurement error in the dependent and independent variables in each relationship. When available, the internal reliability estimates were used, otherwise, we calculated the average estimate for each variable across all studies reporting reliability information (Lipsey & Wilson, 2001). The heterogeneity of effect sizes was assessed

using a combination of procedures. In particular, we used the Q statistic and the I^2 statistic as the I^2 is more appropriate for meta-analyses with fewer studies (Huedo-Medina, Sanchez-Meca, Marin-Martinez, & Botella, 2006).

Moderator Analysis. Weighted least squares regression analysis is used to test the influence of the proposed moderators (Steel & Kammeyer-Mueller, 2002). We use the inverse variance weights as analytic weights to correct for differences between samples sizes included in our meta-analysis (Hedges & Olkin, 1985). Given the heterogeneity of effect sizes in prior meta-analytic studies in the field of entrepreneurship (e.g., Rauch, Wiklund, Lumpkin, & Frese, 2009) and the recommendations in the literature (Geyskens et al., 2009), we use a mixed-effects model (Lipsey & Wilson, 2001). In the case of an insufficient number of studies to conduct the moderator analysis ($k < 10$), the respective effect size relationship was excluded from the moderator analysis (Card, 2012). If a relationship showed no or insufficient variation on a particular moderator ($k < 5$ for one category), that moderator was excluded from the respective regression analysis.

Meta-Analytic Structural Equation Modeling. Meta-analytic structural equation modeling allows us to investigate relationships between different constructs, although no individual study has included all constructs and, therefore, presents the most appropriate statistical approach for testing competing theories (Becker, 2009; Viswesvaran & Ones, 1995) as well as for integrating competing theories (Leavitt, Mitchell, & Peterson, 2010). Following Viswesvaran and Ones's procedure and the recommendations by Landis (2013), we constructed meta-analytic correlation matrices and analyzed path models using the structural equation modeling. We used AMOS 21 (Arbuckle, 2012) and maximum likelihood estimation to test the path models. We used the respective harmonic mean sample size as the sample size for the analysis (Viswesvaran & Ones). Due to the restrictiveness of the chi-square (χ^2) approach, we used multiple additional indicators to assess model fit, namely the confirmatory fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). To test the mediation in the integrated model, we use a structural equation modeling approach by comparing a series of nested models (James, Mulaik, & Brett, 2006) and the Sobel test (Sobel, 1982).

Analysis and Results

Bivariate Relationships, Moderator Analysis, and Path Analysis

TPB. Summary findings of the meta-analyses for the TPB are reported in Table 2. The relationships between EI and ATB ($r_c = .43$, $p < .05$), subjective norm ($r_c = .36$, $p < .05$), ESE ($r_c = .28$, $p < .05$), and PBC ($r_c = .56$, $p < .05$) are all positive and statistically significant. The results are comparable with extant meta-analytic research in terms of the strength of the effect sizes (Armitage & Conner, 2001; ATB: $r_c = .49$; subjective norm: $r_c = .34$; PBC: $r_c = .43$). The results of the Q test as well as the I^2 test indicate that moderation is likely for the different relationships. The left side of Table 3 shows the meta-analytic regression results for the TPB.

The regression model for the relationship between ATB and EI fits the data well ($R^2 = .27$). The homogeneity statistic is significant for the modeled variance in effect sizes ($Q_{Model} = 24.14$; $p < .001$), indicating that the moderators capture the heterogeneity in the effect sizes (Lipsey & Wilson, 2001). No significant effect was found for the year of data

Table 2

Overview of Relationships for the Theory of Planned Behavior

Relationship	Number of effects (<i>k</i>)	Total sample size (<i>N</i>)	Corrected mean (<i>r_c</i>)	Standard error (<i>SE</i>)	90% Confidence interval		<i>Q</i> test	<i>I</i> ²	Availability bias
ATB–EI	70	38,228	.43*	.03	.36	.49	2,303.98*	97	23,248
SN–EI	69	33,519	.36*	.03	.31	.41	1,290.73*	95	15,715
ESE–EI	33	15,961	.28*	.02	.23	.32	228.24*	86	1,002
PBC–EI	32	18,859	.56*	.02	.51	.61	504.24*	94	3,755

Note: The corrected mean correlation coefficients *r_c* are the sample size weighted, reliability corrected estimates of the correlation coefficients across studies. Mean effect sizes and *Q* values marked with * are statistically significant at *p* < .05. ATB, attitude toward the behavior; EI, entrepreneurial intent; ESE, entrepreneurial self-efficacy; SN, subjective norm; PBC, perceived behavioral control.

collection, the national context, and respondent type, implying that the results are stable across sample variations. The construct operationalization variable was significant and positive which means that studies that directly measured ATB showed higher relationships with EI as compared with studies that used indirect measures, such as achievement motivation and need for autonomy. The publication type variable was strongly significant and negative, indicating that the effect size was smaller in studies published in journals compared with studies that were not published. This finding also suggests that our results are unlikely to be influenced by publication bias. The model for the relationship between subjective norm and EI fits the data to an acceptable degree ($R^2 = .13$; $Q_{Model} = 9.35$; $p < .10$). No significant effect was found for construct operationalization, publication type, and respondent type. The year of study variable showed a tendency toward significance, indicating that this relationship was stronger in more recent studies than in earlier studies. The national context variable was significant and positive which means that the relationship between subjective norm and EI was stronger in Western countries compared with non-Western countries. We examined three different regression models to disentangle the influence of PBC and ESE on EI. In the first model, we only included those studies that used PBC; in the second model, we only included those studies that used ESE; and in the third model, we used the pooled sample. While the models for the separate constructs show a poor model fit, the model for the pooled sample fits the data reasonably well ($R^2 = .26$; $Q_{Model} = 20.37$; $p < .01$). The construct operationalization variable was strongly significant and positive, indicating that studies that used PBC to predict EI showed higher effect sizes than studies that employed ESE. This result confirms prior research that conceptually and empirically distinguished the two variables (Ajzen, 2002; Conner & Armitage, 1998). While self-efficacy and PBC are related concepts, their effect on EI differs significantly. Furthermore, the respondent type variable was significant and positive, which means that studies that used a student sample showed a stronger relationship than those studies that used nonstudent samples.

Following the recommendations in the literature (Michel, Viswesvaran, & Thomas, 2011), the sample size adjusted mean effect sizes were used as input for the correlation matrix, which provided the basis for the path analysis. Sample descriptives and derived meta-analytic correlations are presented in Table 4. ATB, subjective norm, and PBC have

Table 3

Results of Mixed Effects WLS Regression (TPB and EEM)

Moderator	Theory of planned behavior				Entrepreneurial event model			
	ATB-EI	SN-EI	PBC-EI	ESE-EI	PBC/ESE-EI	PD-EI	PF-EI	PA-EI
Construct operationalization	.23*	.12	n/a	n/a	.43***	-.05	n/a	n/a
Year of study	-.02	.24 [†]	.02	-.07	.00	.32 [‡]	.09	.00
Publication type (journal = 1)	-.42***	-.15	-.19	.04	-.13	-.14	.09	.26
National context (Western = 1)	-.11	.26*	.02	-.07	-.02	.39*	.35 [†]	-.21
Respondent type (student = 1)	.08	-.03	.32 [†]	.20	.25*	-.57***	.21	n/a
R ²	.27	.13	.14	.05	.26	.41	.16	.13
Q _{Model}	24.14***	9.35 [†]	4.80	1.53	20.37**	16.96***	5.47	3.94
Q _{Residual}	65.64	64.50	29.19	28.54	57.84	24.59	28.19	26.22
ν	.06	.04	.02	.01	.02	.01	.02	.01
k	68	65	30	31	61	25	29	25

[†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Note: Standardized regression coefficients are presented.

ATB, attitude toward the behavior; EI, entrepreneurial intent; ESE, entrepreneurial self-efficacy; SN, subjective norm; PBC, perceived behavioral control; PD, perceived desirability; PF, perceived feasibility; PA, propensity to act; n/a, not applicable. k is the total number of effect sizes; Q is the homogeneity statistic; ν is the random effects variance component.

Table 4

Meta-Analytic Correlation Matrix (Theory of Planned Behavior)

Variable	1	2	3	4	5	6	7
1 Entrepreneurial intent	(.82)	46/70 38,228	48/69 33,519	30/32 18,859	14/33 15,961	11/12 12,512	19/21 21,967
2 Attitude toward the behavior	.35	(.80)	30/51 23,752	24/27 17,773	9/28 5,540	10/11 12,048	16/18 19,620
3 Subjective norm	.29	.27	(.79)	26/29 18,076	6/24 5,041	9/14 11,461	13/9 11,103
4 Perceived behavioral control	.44	.41	.27	(.77)	1/1 192	8/8 9,337	11/12 8,029
5 Entrepreneurial self-efficacy	.23	.32	.21	.05	(.84)	1/1 87	2/2 1,840
6 Age	.05	.01	-.05	.01	.06		9/10 8,603
7 Gender (female = 1)	-.06	-.04	.01	-.04	.05	-.02	

Note: Sample-weighted correlations are presented below the diagonal. The number of studies, number of effects, and the total sample sizes are given above the diagonal. Average construct reliabilities are depicted on the diagonal.

a significant and positive effect on EI and explain 28% of the variance in EI ($\chi^2 = 1.01$; $df = 4$; $p < .91$; CFI = 1.00; RMSEA = .00; SRMR = .00). The results of the path analysis are summarized in Figure 4. Overall, our results are in line with prior meta-analytic research on a variety of different behaviors showing that the determinants proposed by the TPB have significant effects in explaining intention toward performing a particular behavior (Armitage & Conner, 2001; Notani, 1998).

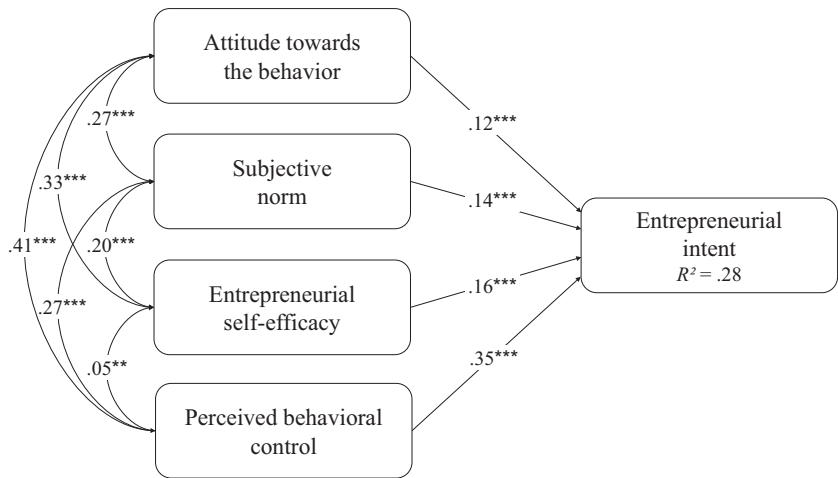
EEM. Summary findings of the meta-analyses for the EEM are reported in Table 5.

The relationships between EI and perceived desirability ($r_c = .51$, $p < .05$), the propensity to act ($r_c = .18$, $p < .05$), and perceived feasibility ($r_c = .41$, $p < .05$) are positive and statistically significant. The results of the Q test as well as the I^2 test indicate that moderation is likely for the three relationships. The right side of Table 3 shows the meta-analytic regression results for the EEM. The regression model for the relationship between perceived desirability and EI fits the data well ($R^2 = .41$; $Q_{Model} = 16.96$; $p < .001$). No significant effect was found for construct operationalization and publication type. The year of study variable showed a tendency toward significance, indicating that the relationship was stronger in more recent studies as compared with earlier studies. The national context variable was significant and positive, indicating that the relationship between perceived desirability and EI is stronger in Western countries compared with non-Western countries. The respondent type variable was highly significant and negative, which means that the relationship was less strong for studies that used students samples compared with studies that used nonstudent samples. The regression models for the perceived feasibility–EI relationship ($R^2 = .16$; $Q_{Model} = 5.47$; $p > .10$) as well as the propensity to act–EI relationship ($R^2 = .13$; $Q_{Model} = 3.94$; $p > .10$) showed a poor fit, indicating that the moderators cannot explain the heterogeneity of effect sizes.

The sample size adjusted mean effect sizes were used as input for the correlation matrix, which provided the basis for the path analysis. Sample descriptives and derived meta-analytic correlations are presented in Table 6. While the propensity to act had no

Figure 4

Path Model Results: Theory of Planned Behavior



Note: $\chi^2 = 1.01$; $df = 4$; $p < .91$; CFI = 1.00; RMSEA = .00; SRMR = .00. Harmonic mean sample size $N_{HM} = 2,167$. Standardized coefficients are provided for each path in the model. Age and gender (coded “1,” female, and “0,” male) had paths to independent and dependent variables. The significant standardized coefficients for the control variable are as follows: Age–ESE, .04[†]; age–subjective norm, –.05*; age–EI, .08***; gender–ATB, –.04[†]; gender–ESE, .05*; gender–PBC, –.04*; gender–EI, –.05**.

[†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 5

Overview of Relationships for the Entrepreneurial Event Model

Relationship	Number of effects (k)	Total sample size (N)	Corrected mean (r_c)	Standard error (SE)	90% Confidence interval	Q test	I^2	Availability bias
PD–EI	32	47,633	.51*	.04	.43 .58	1,647.10*	98	3,057
PF–EI	38	47,633	.41*	.03	.36 .47	1,245.06*	97	3,427
PA–EI	28	13,587	.18*	.03	.13 .23	192.81*	86	235

Note: The corrected mean correlation coefficients r_c are the sample size weighted, reliability corrected estimates of the correlation coefficients across studies. Mean effect sizes and Q values marked with * are statistically significant at $p < .05$. EI, entrepreneurial intent; PD, perceived desirability; PF, perceived feasibility; PA, propensity to act.

effect on EI, perceived desirability and perceived feasibility had a significant and positive effect and explained 21% of the variance in EI ($\chi^2 = .58$; $df = 2$; $p < .74$; CFI = 1.00; RMSEA = .00; SRMR = .01). The results of the path analysis are summarized in Figure 5. Overall, our results show that perceived desirability and perceived feasibility are the significant determinants of EI within the EEM.

Table 6

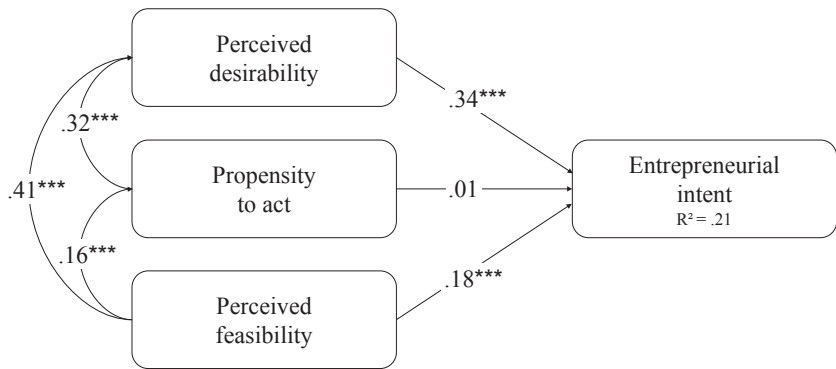
Meta-Analytic Correlation Matrix (Entrepreneurial Event Model)

Variables	1	2	3	4	5	6
1 Entrepreneurial intent	(.85)	31/31 24,500	36/37 30,850	25/28 13,587	7/7 2,927	12/12 19,482
2 Perceived desirability	.42	(.77)	23/23 13,727	2/2 241	6/6 2,840	9/9 13,125
3 Perceived feasibility	.33	.43	(.74)	6/7 6,174	7/7 2,927	11/11 18,575
4 Propensity to act	.14	.33	.16	(.73)	1/1 207	2/2 6,270
5 Age	.08	.08	.09	-.02		6/6 2,616
6 Gender (female = 1)	-.10	-.11	-.13	-.05	-.01	

Note: Sample-weighted correlations are presented below the diagonal. The number of studies, number of effects, and the total sample sizes are given above the diagonal. Average construct reliabilities are depicted on the diagonal.

Figure 5

Path Model Results: Entrepreneurial Event Model



Note: $\chi^2 = .58$; $df = 2$; $p < .74$; CFI = 1.00; RMSEA = .00; SRMR = .01. Harmonic mean sample size $N_{HM} = 1,349$. Standardized coefficients are provided for each path in the model. Age and gender (coded “1,” female, and “0,” male) had paths to independent and dependent variables. The significant standardized coefficients for the control variable are as follows: Age—perceived desirability, .11*; gender—perceived desirability, -.10*; age—EI, .05†; gender—EI, -.04‡; gender—propensity to act, -.04†.

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

The Integrated Model of EI. To test hypotheses 1 and 2, we conducted bivariate meta-analyses. The results for the main relationships of the proposed integrated model are reported in Table 7.

Hypothesis 1 predicts that ATB (hypothesis 1a), subjective norms (hypothesis 1b), ESE (hypothesis 1c), and PBC (hypothesis 1d) have a positive effect on perceived desirability. Both the ATB–perceived desirability relationship ($r_c = .26$, $p < .05$) and the subjective norm–perceived desirability relationship ($r_c = .29$, $p < .05$) are significant and

Table 7

Main Relationships for the Integrated Model

Relationship	Number of effects (k)	Total sample size (N)	Corrected mean (<i>r_c</i>)	Standard error (SE)	90% Confidence interval		<i>Q</i> test	<i>I</i> ²	Availability bias
ATB–EI	70	38,228	.43*	.03	.36	.49	2,301.79*	97	23,185
ATB–PD	5	11,793	.26*	.11	.04	.48	514.63*	99	1
SN–EI	69	33,519	.36*	.03	.31	.41	1,289.72*	95	15,714
SN–PD	11	5,071	.29*	.06	.17	.41	130.93*	92	31
ESE–EI	45	56,453	.28*	.01	.25	.30	416.93*	89	2,516
ESE–PD	5	9,728	.37*	.10	.17	.58	965.20*	100	1
ESE–PF	5	10,141	.31*	.05	.21	.41	155.20*	97	1
PBC–EI	32	18,859	.56*	.02	.51	.61	504.24*	94	3,755
PBC–PD	2	1,800	.59*	.07	.46	.72	43.95*	98	1
PBC–PF	3	1,992	.82*	.09	.62	.99	117.00*	98	4
PD–EI	32	41,283	.51*	.04	.43	.59	1,692.95*	98	3,122
PF–EI	30	41,068	.45*	.03	.39	.51	1,099.51*	97	1,990
PA–EI	28	13,587	.18*	.02	.13	.24	192.81*	86	240

Note: The corrected mean correlation coefficients *r_c* are the sample size weighted, reliability corrected estimates of the correlation coefficients across studies. Mean effect sizes and *Q* values marked with * are statistically significant at *p* < .05. EI, entrepreneurial intent; ATB, attitude toward the behavior; SN, subjective norm; PBC, perceived behavioral control; PD, perceived desirability; PF, perceived feasibility; ESE, entrepreneurial self-efficacy; PA, propensity to act.

positive. Also the relationships between ESE and perceived desirability (*r_c* = .37, *p* < .05) as well as between PBC and perceived desirability (*r_c* = .59, *p* < .05) are significant and positive. In sum, hypotheses 1a, 1b, 1c, and 1d were supported. Hypothesis 2 predicts that both ESE (hypothesis 2a) and PBC (hypothesis 2b) have a positive effect on perceived feasibility. The relationship between ESE and perceived feasibility (*r_c* = .31, *p* < .05) as well as the relationship between PBC and perceived feasibility (*r_c* = .82, *p* < .05) were significant and positive. Therefore, hypotheses 2a and 2b were supported. The results of the *Q* test as well as the *I*² test indicate that moderation is likely for the relationships between the distal TPB variables and the proximal EEM variables. Before examining the meta-analytic structural equation model, we explored the potential influence of the identified moderators on the different relationships and used moderator analysis to test the difference of antecedents integrated in this model. In the literature, the differences and similarities of PBC, self-efficacy, and locus of control have been controversially discussed (Ajzen, 2002). Several researchers that empirically examined EI have utilized measures of ESE as opposed to PBC in the TPB and ESE or PBC as opposed to perceived feasibility in the EEM. Moreover, the majority of studies used locus of control as an operationalization of the propensity to act, which might introduce additional ambiguity (Ajzen). As a result, several variables included in the integrated model potentially overlap in their effect on EI. Meta-analysis offers a unique opportunity to test differences in the effects of variables, what is also regarded as an important precondition for comparing and integrating theories in a meaningful way (Leavitt et al., 2010). To test the moderating role of the different measures, we merged the effect sizes for the different relationships and dummy coded the four variables. Table 8 presents the results of the meta-analytic regression analysis.

Table 8
Results of Mixed Effects WLS Regression (Integrated Model)

Moderator	PBC/ESE/PF/PA-EI			ATB/SN/PD-EI			G-EI	Age-EI
	Model 1	Model 2	Model 3	Model 1	Model 2	SN-PD		
Year of study	.01	.01	.01	.12	.12	-.42	.05	-.53**
Publication type (journal = 1)	.06	.06	.06	-.25***	-.25***	-.13	.08	-.10
National context (Western = 1)	.01	.01	.01	.08	.08	-.24	.05	-.58**
Respondent type (student = 1)	.17*	.17*	.17*	-.07	-.07	n/a	.11	.36*
Measurement moderators								
Perceived behavioral control	.73***	.16 [†]	—					
Entrepreneurial self-efficacy	.53***	-.28**	-.20***					
Perceived feasibility	.36***	—	-.08 [†]					
Propensity to act	—	-.55***	-.71***	-.32**	.02			
Attitude toward the behavior				-.34***				
Subjective norm					.26**			
Perceived desirability				.14	.14	.19	.02	.52
R ²	.36	.36	.36	26.19***	26.19***	2.33	.64	17.79***
Q _{Model}	62.03***	62.03***	62.03***	156.99	156.99	9.90	26.97	16.50
Q _{Residual}	109.44	109.44	109.44	.06	.06	.01	.03	.002
ν	.02	.02	.02	159	159	10	26	17
k	111	111	111					

[†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Note: Standardized regression coefficients are presented. K is the total number of effect sizes; Q is the homogeneity statistic; ν is the random effects variance component.

Models 1–3 on the left side of Table 8 show that the four measure moderators are positive and significant or at least show a tendency toward significance, indicating that in terms of their effect on EI, the four variables are distinct from, although not necessarily unrelated to, each other. For PBC, ESE, and locus of control, this result confirms the findings of previous studies (for an overview, see Ajzen, 2002) that showed the distinct effects of the different variables. We apply the same procedure for ATB, subjective norm, and perceived desirability as prior literature suggested that the two TPB antecedents are incorporated in the perceived desirability construct, and researchers have empirically utilized measures of ATB and subjective norm as opposed to perceived desirability in the EEM. Models 1 and 2 in the middle of Table 8 show that the moderators for ATB and subjective norm are significant, indicating that they are distinct from perceived desirability in their effect on EI. Moreover, the results show that the effects of ATB and subjective norm on EI are comparable in their strength. Overall, our findings suggest that the examined constructs used in the TPB and EEM vary to a certain degree in their effect on EI and, as a result, the competing models can be compared and integrated (Gray & Cooper, 2010; Leavitt et al., 2010). Ten or more studies investigated the gender–EI, the age–EI, and the subjective norm–perceived desirability relationship, and therefore, we conducted moderator analysis for these three relationships. The results are presented on the right side of Table 8. The model fit for the subjective norm–perceived desirability relationship as well as the gender–EI relationship show a poor model fit. The regression model for the age–EI relationship fits the data well ($R^2 = .52$; $Q_{Model} = 17.79$; $p < .01$). While no significant effect was found for publication type, the year of study variable and the national context variable were significant and negative, and the respondent type variable was significant and positive, indicating that the strength of this relationship depends on context and sample characteristics. Overall, given the small number of effect sizes ($k < 10$), we were unable to conduct moderator analyses that investigated the other relationships proposed in the integrated model, which is a limitation of this study.

We used meta-analytic structural equation modeling to examine the fit and the predictive power of the integrated model and to test hypotheses 3 and 4. Sample descriptives and derived meta-analytic correlations are presented in Table 9.

Shapero and Sokol (1982) suggest that more distal factors indirectly influence EI through their effect on perceived desirability and perceived feasibility. In the MGB (Perugini & Bagozzi, 2001) as well as in the EMGB (Perugini & Conner, 2000), it has been suggested that the TPB determinants influence intentions indirectly through their effect on desires. Consequently, we tested a full mediation model as the baseline model. Mediation is indicated when the paths between the independent variables (ATB, subjective norm, ESE, and PBC) and the respective mediator variables (perceived desirability and perceived feasibility), as well as the paths between the mediator variables and the dependent variable (EI) are significant, and the overall model shows acceptable goodness of fit (James et al., 2006). The proposed integrated model did not fit the data well, with several indexes failing to meet the requirements ($\chi^2 = 188.45$; $df = 9$; $p < .000$; $CFI = .93$; $RMSEA = .12$; $SRMR = .05$). We followed the recommendations by Anderson and Gerbing (1988) and examined an alternative model that was plausible on theoretical arguments. Specifically, we added direct relationships between subjective norm and perceived feasibility as well as between perceived feasibility and perceived desirability. More favorable subjective norm should result in a more favorable perception of feasibility with regard to the behaviors that are related to the start of a business. Individuals perceive behaviors as more desirable when they perceive these behaviors also as being more feasible, in particular, when the feasibility is related to the start of an own venture. Estimation of the revised integrated model ($\chi^2 = 162.33$; $df = 7$; $p < .000$; $CFI = .94$;

Table 9

Meta-Analytic Correlation Matrix (Integrated Model)

Variable	1	2	3	4	5	6	7	8	9	10
1 Entrepreneurial intent	(.83)	46/70 38,228	48/69 33,519	29/32 18,859	25/44 24,403	31/31 24,500	29/29 24,285	27/28 13,587	18/19 15,439	25/29 30,248
2 Attitude toward the behavior	.35	(.80)	30/51 23,752	24/27 17,773	10/29 5,732	5/5 11,793	4/4 11,601	7/9 4,172	10/11 12,048	16/18 19,620
3 Subjective norm	.29	.27	(.79)	26/29 18,076	8/26 5,535	11/11 5,071	8/8 4,172	2/2 365	9/9 11,461	14/15 11,405
4 Perceived behavioral control	.44	.41	.27	(.77)	1/1 192	2/2 1,800	3/3 1,992	2/2 8,029	8/8 9,337	11/12 8,029
5 Entrepreneurial self-efficacy	.23	.32	.21	.05	(.84)	5/5 9,728	5/5 10,141	7/8 7,292	2/2 398	6/6 8,120
6 Perceived desirability	.42	.20	.22	.46	.29	(.77)	22/22 13,612	2/2 241	6/6 2,840	9/9 13,125
7 Perceived feasibility	.37	.31	.28	.61	.25	.41	(.73)	1/1 126	6/6 2,840	9/9 13,125
8 Propensity to act	.14	-.09	.21	.22	.18	.33	.19	(.73)	1/1 207	2/2 6,270
9 Age	.06	.01	-.05	.01	.06	.08	.09	-.02		15/16 11,219
10 Gender (female = 1)	-.07	-.04	.00	-.04	-.10	-.11	-.10	-.05	-.02	

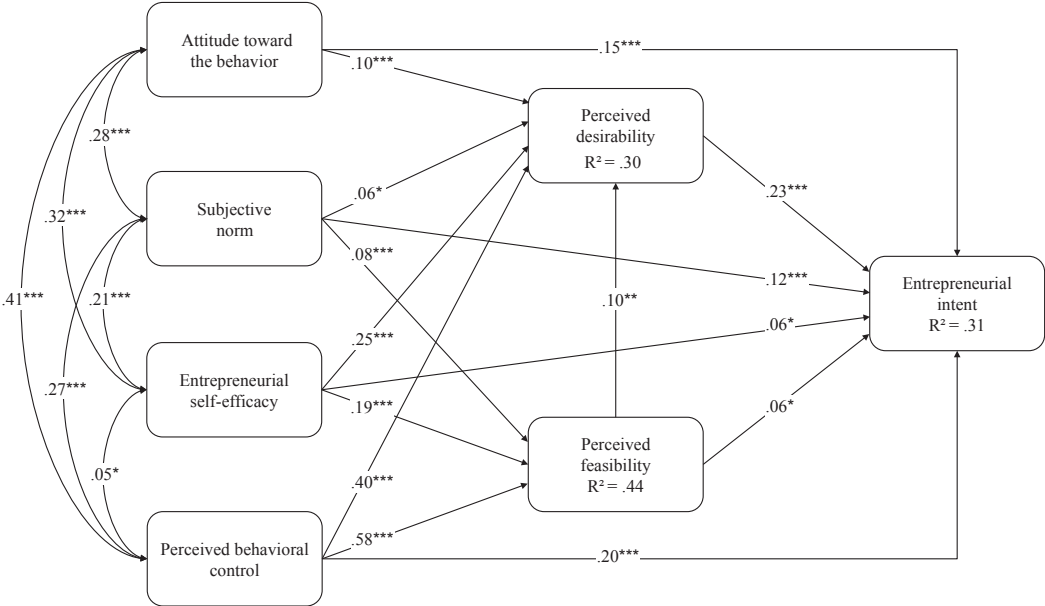
Note: Sample-weighted correlations are presented below the diagonal. The number of studies, number of effects, and the total sample sizes are given above the diagonal. Average construct reliabilities are depicted on the diagonal.

RMSEA = .13; SRMR = .05) resulted in a significantly better fit ($\Delta\chi^2 = 26.12$; $\Delta df = 2$; $p < .000$). To test whether partial or full mediation is present, we compared the revised integrated model with a partial mediation model as well as a nonmediated model (James et al.). In the partial mediation model, we specified direct paths from the four TPB determinants to EI and included all other specifications that were also included in the revised integrated model. The partial mediation model had an excellent fit ($\chi^2 = 3.79$; $df = 3$; $p < .29$; CFI = 1.00; RMSEA = .01; SRMR = .01). The change in the value of chi-square between the revised full mediation model and the partial mediation model was highly significant ($\Delta\chi^2 = 158.44$; $df = 4$; $p = .000$). The added direct paths from ATB, subjective norm, ESE, and PBC to EI were all significant and positive. In the nonmediated model, we specified direct paths from the four TPB determinants to EI and excluded all other direct paths to EI. The nonmediated model did not fit the data well ($\chi^2 = 84.82$; $df = 5$; $p < .000$; CFI = .97; RMSEA = .11; SRMR = .03) and showed a worse fit than the partial mediation model ($\Delta\chi^2 = 81.03$; $df = 2$; $p = .000$). The tests and comparisons of the path models suggested that the revised integrated model with partial mediation depicted in Figure 6 provided the best fit for the data.

In partial support of hypothesis 3, which predicted that the effect of ATB (hypothesis 3a), subjective norm (hypothesis 3b), ESE (hypothesis 3c), and PBC (hypothesis 3d) on EI is mediated by perceived desirability, the effect of all four determinants is partially mediated by perceived desirability. In partial support of hypotheses 4, which predict that ESE (hypothesis 4a) and PBC (hypothesis 4b) have an indirect effect on EI through perceived feasibility, the influence of both variables on EI was partially mediated by perceived feasibility. In addition to the meta-analytic structural equation modelling

Figure 6

Path Model Results: Revised Integrated Model



Note: $\chi^2 = 3.79$; $df = 3$; $p < .29$; CFI = 1.00; RMSEA = .01; SRMR = .01. Harmonic mean sample size $N_{HM} = 1,385$. Standardized coefficients are provided for each path in the model. For the attitude-perceived desirability path the multicollinearity adjusted coefficient is reported. Age and gender (coded “1,” female, and “0,” male) had paths to independent and dependent variables with the same result as reported above for the TPB and EEM path models.
† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

(MASEM) procedure, Sobel tests (Sobel, 1982) confirmed the indirect effects of the TPB variables on EI. A comparison of the direct, indirect, and total effects revealed that the direct effects of the four TPB antecedents on EI are stronger than their indirect effects. Moreover, the results show that only for subjective norm the total effect on EI is stronger than the effect on the two mediating EEM variables, compared with ATB, ESE, and PBC, which show stronger total effects on the EEM variables than EI. Overall, the findings suggest that the effect of the TPB variables on EI is complementary mediated by the EEM variables (Zhao, Lynch, & Chen, 2010), suggesting that other mediators are involved in this mechanism.

Comparison of the Competing Models

As a next step, we compared the correlations of the different determinants in the two competing models. All determinants are predictors of the same dependent variable (EI), and consequently, the comparison of correlations has to take account of the relationship between the different determinants. We followed the recommendations in the literature for comparing nonindependent correlations (Meng, Rosenthal, & Rubin, 1992) and applied Steiger’s z-test (Steiger, 1980) as well as the procedure suggested by Zou (2007), which takes into account the confidence limits around overlapping effect sizes. The sample size for the comparisons was determined by following a conservative approach and so we used the harmonic mean samples size across the primary studies included in the TPB ($n = 188$)

Table 10

Differences in Correlations

Variable	(i)	ATB	SN	PBC	ESE	PD	PF
SN	r_{cI}/r_{cSN}	.43/.36					
	Δr	.07					
	CI	-.05/.19					
PBC	r_{cI}/r_{cPBC}	.43/.56	.36/.56				
	Δr	-.13*	-.20**				
	CI	-.25/-.01	-.38/-.02				
ESE	r_{cI}/r_{cESE}	.43/.28	.36/.28	.56/.28			
	Δr	-.15*	.08	.28**			
	CI	-.30/-.01	-.06/.21	.06/.50			
PD	r_{cI}/r_{cPD}	.43/.51	.36/.51	.56/.51	.28/.51		
	Δr	-.08	-.15*	.05	-.23**		
	CI	-.20/.03	-.29/-.01	-.03/.13	-.41/-.06		
PF	r_{cI}/r_{cPF}	.43/.45	.36/.45	.56/.45	.28/.45	.51/.45	
	Δr	-.02	-.09	.11†	-.17*	.06	
	CI	-.13/.08	-.20/.02	.02/.20	-.31/-.03	-.02/.14	
PA	r_{cI}/r_{cPA}	.43/.18	.36/.18	.56/.18	.28/.18	.51/.18	.45/.18
	Δr	.25**	.18*	.38***	.10	.33***	.27***
	CI	.01/.48	.03/.33	.16/.59	-.03/.23	.14/.52	.03/.50

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$
Note: The sample-weighted and reliability corrected correlation coefficients (r_c) are compared. The confidence interval (CI) is presented for the respective probability level. For all nonsignificant comparisons, the 90% confidence interval is presented.
ATB, attitude toward the behavior; ESE, entrepreneurial self-efficacy; SN, subjective norm; PA, propensity to act; PBC, perceived behavioral control; PD, perceived desirability; PF, perceived feasibility.

and the EEM (n = 264) for the correlations between the respective determinant and EI. For the correlations between the different determinants, we used the harmonic mean samples size across the primary studies included in the integrated model (n = 215). The two tests provide an indication of whether the differences in the correlations are statistically significant. The larger the difference in two correlations, the more likely is a difference in predictive power of one determinant over the other, indicating whether the TPB or the EEM determinants are better predictors of EI. The results of the comparisons for all seven determinants are presented in Table 10.

The results show that within the TPB, the effect size for the PBC–EI relationship is significantly larger compared with those of ATB, subjective norm, as well as ESE (Steiger’s z-test is significant and the confidence interval does not include zero). The difference in the effect sizes for ATB and subjective norm is not significant (Steiger’s z-test is not significant and the confidence interval does include zero), while it is significant for the difference in the effect sizes for ATB and ESE. For the EEM, the results show that the effect size for perceived desirability and perceived feasibility do not differ significantly, while both show significantly larger effect sizes than the propensity to act. When comparing all seven determinants included in the two theories, the TPB determinants show significantly higher correlation coefficients than the EEM in four out of the eight comparisons, while the EEM determinants show significantly higher effect sizes in three comparisons. The majority of studies operationalized the propensity to act in terms of the locus of control, which might fail to capture the specific features of the propensity

to act construct. When we excluded propensity to act from the comparisons, the EEM determinants still showed significantly higher effect sizes in three out of eight comparisons, while only the PBC–EI effect size was larger than the perceived feasibility–EI effect size at $p < .10$ for the TPB determinants. When the effect sizes for PBC and ESE are pooled, this effect disappears completely. In sum, the findings of the correlations comparison suggest that the EEM determinants show stronger effect sizes than the TPB determinants. In meta-analytic structural equation analyses, all three models achieve comparable fit to the data. Therefore, it is reasonable to examine the models in terms of their explanatory power. The results show that the TPB determinants ($R^2 = .28$) together explain a larger variance in EI than the EEM determinants ($R^2 = .21$). The integrated model of EI provides a better predictive power with a slight increase in the explained variance ($R^2 = .31$) relative to both the TPB and the EEM. This result indicates that the integrated model provides additional insights into EI. In the integrated model, perceived desirability exhibited the strongest direct effect. PBC appeared to have a weaker direct effect on EI than perceived desirability, but exhibited a stronger influence on intention than ATB and subjective norm. Overall, these results confirm the prediction of the MGB and the EMGB that individuals' desire is the most immediate predictor of behavioral intention.

Discussion and Conclusion

Despite the high number of studies on the determinants of EI, little conclusive evidence has been obtained about the theoretical coherence of the two most widely utilized theories, namely the TPB and the EEM. Using meta-analytic data from 114,007 individuals across 123 independent samples reported in 98 studies, our study presents a systematic review of the literature and meta-analytically compares and integrates the two conceptual frameworks to achieve more theoretical clarity and robustness.

Limitations

Before we elaborate on the implications of our results, several limitations need to be addressed. First, the cross-sectional research design of the majority of EI studies limits our ability to make causal references between study variables. Meta-analysis is insensitive to causal directions (Aguinis, Pierce, Bosco, Dalton, & Dalton, 2011), and therefore, longitudinal data or experimental and quasi-experimental research designs are necessary to establish causal linkages (Wood & Eagly, 2009). Second, the conclusions drawn from the results of moderator analyses are based on relatively small numbers of effect sizes and, therefore, should be interpreted with caution. The existence of moderators and in particular the interaction between moderators is difficult to confirm in meta-analysis due to a lack of statistical power and dichotomization before moderator analysis (Aguinis, Gottfredson, & Wright, 2011; Aguinis & Pierce, 1998; Aguinis, Pierce, et al.; Dalton & Dalton, 2008). Our meta-analysis was also limited to the information reported among the retrieved primary studies, and further research is warranted to substantiate the proposed structural model and make more confident generalizations about the strength of these relationships (Cooper & Hedges, 2009).

Implications for Theory

The results of the bivariate meta-analyses show that the different determinants included in the two theories have a positive effect on EI. While prior research has in

particular questioned the role of subjective norm in explaining EI, our findings indicate that subjective norm is more predictive of EI than ESE. Compared with the meta-analytic findings of prior studies, the effect sizes for the determinants of the two theories are substantially greater than the direct effects of entrepreneurship education (Martin et al., 2013) and personality traits on EI (Zhao, Seibert, et al., 2010) and comparable with the direct influence of risk propensity on EI (Zhao, Seibert, et al.). For the TPB, our results are comparable with those obtained by Armitage and Conner (2001). Comparison of the effect sizes and path analysis revealed that, while the EEM determinants show larger effect sizes compared with the TPB determinants, the latter theory explains a larger amount of variance in EI. Thereby, we advance and challenge the findings by Krueger et al. (2000), who found that the EEM has higher predictive power.

Using meta-analytic structural equation modeling, we tested an integrated model of EI based on the MGB and the EMGB and identified the mechanism through which the different determinants are related and together affect EI. The results show that the TPB determinants as well as perceived feasibility particularly influence EI through perceived desirability. This important finding confirms the MGB and suggests that it is an individual's desire through which the other determinants are transformed into EI. Moreover, we expand the findings of prior research by providing evidence in favor of a partial mediation model, as opposed to a full mediation model. This finding, in particular, suggests that if an individual has more perceived control over starting a business, PBC becomes an important predictor of EI next to the desire to start a business venture. We show that, in particular, PBC affects individual intentions directly and hereby extend the MGB. The integration of the EEM and the TPB helped to identify and understand the interrelationships between their constructs, which is important for advancing theory in the EI domain.

In the moderator analysis, we identified significant contextual and methodological moderators that help to explain the mixed results across studies and cast light on the boundary conditions of the competing theories. One major contribution of this meta-analysis is that the results of the moderator analysis suggest differential effects of the TPB and EEM determinants on EI. This finding challenges prior research, which assumed that perceived desirability includes attitudes and subjective norm and that perceived feasibility includes ESE and PBC. Our results show that the different variables operate through different pathways (ATB and subjective norm) or vary in the strength of the paths when they operate through the same pathways (ESE and PBC).

The findings of the current study also suggest the need for a more contextual perspective and approach to conceptualizing the development of EI. We found that the subjective norm–EI relationship and the perceived desirability–EI relationship had a stronger positive association in Western countries. Compared with non-Western countries, Western societies are characterized by different cultural norms and values, such as higher levels of independence and individualism, emphasizing the uniqueness of individuals' goals and achievements (Brandl & Bullinger, 2009). Individuals in Western societies define themselves in terms of their actions and, at the same time, are bound to societal norms. As a result, subjective norm and perceived desirability may have a stronger effect on EI in Western societies. Furthermore, our meta-analysis exposed that subjective norm and perceived desirability had a stronger positive relationship with EI for more recent studies. This finding suggests that there is no significant decline effect (Lehrer, 2010; Schooler, 2011), and instead, the relationships are getting stronger for two of the main relationships what might have different reasons. While several explanations for a decline or incline in effect sizes have been offered (Bosco, Aguinis, Leavitt, Singh, & Pierce, 2013), future research should seek to identify the specific sources for variations over time in the EI field. Economic and institutional conditions impact entrepreneurship change over

time and affect the entrepreneurial process (Tolbert, David, & Sine, 2011). Prior research has shown that EI is influenced by economic conditions and institutional settings (Griffiths et al., 2009; Shinnar, Giacomini, & Janssen, 2012). The improved institutional conditions for entrepreneurs combined with an unstable economic situation might have created the environment in which becoming an entrepreneur is more desirable and is perceived as being more attractive by important others. In particular, the finding that the subjective norm–EI relationship is affected by contextual moderators clarifies the nature of this relationship and partially explains the inconclusive findings of previous studies.

Implications for Researchers and Educators

While researchers should be careful to use mean effect sizes based on cross-sectional studies to decide which variable has the strongest effect on EI, or to decide which theory offers the best explanation of EI, the presented meta-analytic results can help researchers to set priorities for future studies. Variables that predict EI well, such as PBC and perceived desirability, should have a higher priority for future research than variables that predict EI poorly, such as propensity to act (locus of control). Theories that predict EI well should be given a higher priority for future research to explore their potential compared with theories that predict EI poorly. Our results showed that the integrated model accounted for .31 of the variance in EI compared with .28 and .21 for the TPB and the EEM. While the TPB and the EEM are more parsimonious, the more complex integrated model provides a more complete understanding of the determinants of EI and their interrelationships. Therefore, to make a choice between the competing theories, it is important to consider the trade-off between more explanatory power and a deeper understanding of the specific contribution of each theoretical construct. Our meta-analytic evidence suggests that a combination of the TPB with perceived desirability is most powerful in explaining and understanding EI. Consequently, utilizing more complex theories, such as the MGB, that provide a better understanding and explanation of EI than the TPB and the EEM alone should be given a higher priority in future research.

Our results also offer implications for researchers how to best capture and measure the determinants of EI. If an operationalization of a variable predicts EI better than another operationalization, the former should deserve higher priority for future research attention. Our moderator analyses revealed that studies that operationalized ATB in line with Ajzen (1991) yielded stronger effect sizes than studies that used other constructs, such as achievement motivation and the need for autonomy. Our results revealed that propensity to act, which was in nearly all studies operationalized using locus of control, neither had a significant effect in the EEM nor in the integrated model on EI. Moreover, while prior research has pointed out that perceived desirability is similar to or includes ATB and subjective norm, we found different strengths of effect sizes for ATB and subjective norm compared with perceived desirability. Our analysis also indicated that ESE, PBC, and perceived feasibility produced different effect sizes and are distinct constructs in their effect on EI. This finding supports recent research (Crook, Shook, Morris, & Madden, 2010; Shook et al., 2003) that calls for greater attention to measurement properties and more empirical precision. One implication is that future research should not use the TPB and EEM constructs interchangeably as the constructs seem to be distinct from each other.

The analysis of the methodological moderators provides insights on how methodological choices of researchers affect effect sizes and results. Our results showed that for the PBC–EI relationship, the effect size was stronger for student samples compared with nonstudent samples. In contrast, our results showed that the relationship between

perceived desirability and EI is stronger for nonstudent samples compared with student samples. These findings have important implications for researchers as the two determinants are the strongest predictors of EI, and in particular, perceived desirability is a mediator for all other determinants in the integrated model. Given their education and training, students might perceive a higher degree of external control but at the same time are not willing to invest as much time and effort in the respective actions necessary to start an own business, resulting in lower levels of perceived desirability. Since we have found no clear pattern for the influence of using a student sample, future research is necessary to examine how EI develops in different phases of life.

We encourage authors, journal reviewers, and editors to apply publications standards that facilitate evidence-based research in the field of entrepreneurship. Only 52–78% of the studies that investigated the TPB and EEM reported reliability information. While the percentages are higher for some of the relationships than those reported in reviews on entrepreneurship methodology (Crook et al., 2010; Heuer & Liñán, 2013; Mullen, Budeva, & Doney, 2009), the numbers for the majority of relationships are below these percentages. Overall, 78 of the primary studies (82%) report data outside of the United States. The majority of these studies do not describe whether and how the research instrument has been translated, which is an important methodological weakness (Harzing, 2005; Liñán & Chen, 2009). Only 77% of the articles reported correlation coefficients for all variables included in the respective study. Given these findings and the results of the moderator analysis, reviewers and editors should require and support authors to report the information (i.e., variable measures, reliabilities, correlation coefficients, year of study etc.) that allows the comparison of studies. Close consideration of these issues enables researchers to replicate or synthesize the results of prior empirical studies.

Entrepreneurship educators may use the findings of the present study to foster EI and to choose an instrument to evaluate components of their entrepreneurship education curriculum. Our results emphasize the importance of perceived desirability and its direct antecedents in the development of EI. To increase EI, educators should actively seek to strengthen students' entrepreneurship-related skills and capabilities to increase ESE and PBC and to positively affect students' perceived desirability to become an entrepreneur. Educators should highlight the advantages of starting one's own firm, i.e., by enabling students to gain experiences in (successful) start-ups or inviting (successful) entrepreneurs to share their experiences with the students.

Avenues for Future Research

We provide a systematic theory-driven overview of the research on EI as a direction to those embarking on future research and developing and deepening theoretical explanations. First, this meta-analysis focused on the prevolitional process in entrepreneurial behavior. Only a limited number of studies examined the effect of EI on entrepreneurial behavior (Hulsink & Rauch, 2010; Kautonen, Van Gelderen, & Fink, 2013; Kautonen, Van Gelderen, & Tornikoski, 2013; Kolvereid & Isaksen, 2006). While for these studies, the variance explained by EI in actual entrepreneurial behavior (37%) is comparable with meta-analytic evidence in other research domains (Armitage & Conner, 2001), the predictive power of intention on behavior has been questioned (Katz, 1990), for example, due to the time-lag between EI and behavior (Bird, 1992; Katz, 1992). To gain further understanding of the entrepreneurial process, future research should include actual behavior to further test the intent–behavior link. Second, meta-analysis cannot replace focused empirical research as well as it cannot embrace the full complexity of inter-relationships between variables (Cooper & Hedges, 2009). These inter-relationships (e.g.,

the direct influence of the national context on subjective norm) need to be addressed in future primary studies. The findings of our study and previous research (Busenitz & Lau, 1996) suggest that it is meaningful for future research to further explore the contingent role of the formal institutional context (laws, regulations, and policies) as well as the informal institutional context (cultural norms and values). Data sets such as the Global Entrepreneurship Monitor, the Panel Study of Entrepreneurial Dynamics, and the Global University Entrepreneurial Spirit Students' Survey could offer great insights into the context-specific development of EI.

Future research should also identify other determinants that explain variance in EI beyond that accounted for by the TPB and EEM antecedents. The variables included in this meta-analysis are constrained to variables for which sufficient data are available. Thus, the meta-analysis should be considered a summary of the most commonly studied determinants of EI. Future research may examine alternative theories, such as the MGB and the EMGB, and the effects of those variables not included in this study (i.e., positive and negative anticipated emotions). Moreover, while this study focuses on a single stage EI, intentions are more complex psychological states. Prior research (Carsrud & Brännback, 2011; Carsrud, Brännback, Elfving, & Brandt, 2009) suggests that the extent to which initial entrepreneurial intentions are realized and are transformed into behavior might depend on a more complex process, which includes goal intentions and implementation intentions (Bagozzi, Dholakia, & Basuroy, 2003; Gollwitzer & Brandstätter, 1997). This study was also restricted to examine those moderators that were available for coding in existing studies. Previous research (Barbosa, Gerhardt, & Kickul, 2007; Krueger & Kickul, 2006) suggests that other moderators may moderate some of the relationships. Another direction for future research is the possibility of reverse causality. Prior research (Brännback et al., 2007; Krueger, 2009) suggests that an increase in EI may affect desirability and feasibility. Future research should utilize more dynamic models and examine reverse causality and simultaneity in EI models. Finally, our study offers insights into the promises and challenges of theory-driven meta-analysis and meta-analytic structural equation modeling in the area of EI. An important area for further meta-analytic research is the potential mediating role of TPB and EEM variables in the relationship between EI and more distal variables, such as entrepreneurial traits (i.e., achievement motivation, risk propensity, and innovativeness), personality traits (i.e., openness, conscientiousness, and extraversion), entrepreneurial exposure (i.e., entrepreneurship experience), and entrepreneurship education. While prior meta-analytic studies investigated the direct effect, i.e., of personality traits (Zhao, Seibert, et al., 2010) and entrepreneurship education (Martin et al., 2013) on EI, both the TPB (Ajzen, 1991) and the EEM (Shapero & Sokol, 1982) predict that these and other distal variables only have an indirect effect on EI through their impact on the underlying beliefs related to the respective EI determinants (i.e., Haus et al., 2013). Theory driven meta-analysis provides a method to address unresolved research questions and reach “*a sense of theoretical clarity*” (Gartner, 2001, p. 28) of the relationships that entrepreneurship researchers strive to understand.

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