

Do psycho-entrepreneurial traits and social networks matter for innovativeness among Saudi female entrepreneurs?

Psycho-
entrepreneurial
traits & social
networks

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Abstract

Purpose – Psychological and entrepreneurial traits have been widely studied as explicative variables of encouraging entrepreneurial behavior, while their impact on innovative activity is less explored. This study examines whether, how and why psycho-entrepreneurial traits and social networks effect innovativeness among women firm owners.

Design/methodology/approach – Analysis of data collected from 304 Saudi women entrepreneurs accompanied by business accelerators provides a wide support with some notable exceptions. We use Structural Equation Modeling technique to estimate how different constructs interact with each other and jointly affect directly or indirectly women's innovativeness behavior in Saudi Arabia.

Findings – Findings point out that innovativeness is positively and significantly affected by emotional intelligence, internal locus of control, entrepreneurial alertness and entrepreneurial self-efficacy. The construct of entrepreneurial self-efficacy mediates the relationship between both business and personal networks and innovativeness. However, professional forums and mentors have no significant effect on innovativeness.

Research limitations/implications – The sample selection is limited to two entrepreneurial support structures especially business accelerator and business incubator. Expanding the context to other support structures can reinforce the implications and provide more valuable results.

Practical implications – The findings are likely to be of applicability for improving women entrepreneurship by entrepreneurial support structures.

Originality/value – This research is original in the sense that it investigated useful insights of innovativeness among Saudi female entrepreneurs.

Keywords Female entrepreneurship, Women entrepreneurs, Innovativeness, Psycho-entrepreneurial traits, Saudi Arabia

Paper type Research paper

Introduction

Since the emergence of feminist culture and the development of equality between genders, women entrepreneurs contribute significantly to economic growth in most countries (Ng, Wood, & Bastian, 2022; Aaltio & Wang, 2016; Salazar-Camacho *et al.*, 2022). Most research on women entrepreneurs concentrate on identifying obstacles they face, variables

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influencing their success and encouraging their entrepreneurial action. While there is increase of literature on women entrepreneurship, there are still very few studies that focus on their potential innovativeness abilities, particularly in the Middle East and North Africa (MENA) region. The Global Entrepreneurship Monitor report (GEM, 2013) showed lower observed levels of entrepreneurial activity rate (EAR) about 4% among women entrepreneurs in the MENA region. Nevertheless, the GEM (2019) reported that there are two MENA countries, namely Saudi Arabia and Qatar where the female EAR surpasses the male one. This finding shows that entrepreneurial activity is deemed as a challenge for women in MENA countries especially those with weak women's access to the labor market (Fischer & Aydiner-Avsar, 2019; Bastian, Sidani, & El Amine, 2018). Al-Qahtani, Fekih Zguir, Al-Fagih and Koç (2022) argued that women's priorities in the Middle East societies are being homemakers and caregivers of their families. Female entrepreneurship is still an immature research field in MENA region and far from being sufficiently explored with regard to the existing literature (Bastian *et al.*, 2018). There is a need to carry out more extensive studies focusing on women entrepreneurs in MENA countries (Saeedikiya & Aeeni, 2020; Ghiat, 2020) particularly in Saudi Arabia (Aljarodi, Thatchenkery, & Urbano, 2022). In addition, topics of innovation and innovativeness among women entrepreneurs are less dealt in the literatures on gender (Fuentes-Fuentes, Bojica, Ruiz-Arroyo, & y Welter, 2017; Marlow and McAdam, 2012).

Doucouré and Diagne (2022) investigate the relationship between market orientation and innovativeness to create a sustainable competitive advantage among women-owned firms. They found that market orientation effects competitive advantage through innovativeness as an intrinsic resource. Moreover, Sugiyanto and Wijayanti (2023) argued that innovativeness has an impact on business performance through competitive advantage. In their study, Bhagat and Sambargi (2019) found that personal innovativeness has a positive effect on digital marketing adoption among female entrepreneurs. Therefore, there is a gap in research concerning innovativeness as an endogenous variable. This paper tries to fill the gap among the previous studies through the understanding of factors influencing women's innovativeness abilities. In this study, we assess our research question on how psycho-entrepreneurial traits and social network factors influence innovativeness among Saudi women. It aims to identify determinants of innovativeness as a focal point of entrepreneurship through an integrated model. The structural model that we propose presents an original contribution to the field of female entrepreneurship. It integrates both direct and indirect effects between a set of psycho-entrepreneurial traits and social network factors and innovativeness. Then, we will test the model on a sample of Saudi women entrepreneurs who are in the creation stage of the entrepreneurial process. The choice of Saudi Arabia's context is motivated by many reasons. Saudi Arabia has been going through substantial socio-economic transformations since the emergence of the kingdom's Vision 2030 in 2016. It is a G20 country, where the involvement of women in socio-economic activities is ranked among the strategic priorities of the kingdom (Nieva, 2015). Moreover, a lot of recent research has been carried out to elucidate determinant factors of women entrepreneurship development in Saudi Arabia (Khan, 2017; Abou-Moghli & Al-Abdallah, 2019; Al-Asfour, Tlaiss, Khan, & Rajasekar, 2017; Alkhaled & Berghlund, 2018; Al-Kwafi, Khoa, Ongsakul, & Ahmed, 2020; Basaffar, Niehm, & Bosselman, 2018; Chandran & Aleidi, 2019; Damanhour, 2017).

Innovativeness does not mean innovation. Both terms are complementary yet distinct (Czop & Leszczynska, 2011). Innovation is action, while innovativeness reflects the tendency to be innovative and unique in its way of doing things, it is the behavior, attitude and will of a person or a company to follow the novelty.

This study focuses on individual innovativeness and specifically on that of the entrepreneur who is, by nature, open and creative in his way of thinking and who exploits his

innovative ideas to create added value within his company (Bezzina, 2010). Randhawa and Kaur (2005) indicate that entrepreneurship is a sensitive economic activity that demands specific human qualities such as innovativeness to carry out the business and it is for this reason that not all women can be entrepreneurs. In the entrepreneurial context, innovativeness is the major behavior of the entrepreneur. Carland, Hoy, Boulton, and Carland (1984) argue that the tendency to innovate and mobilize new ideas characterizes especially entrepreneurs and distinguishes them from other economic actors. In sum, the concept of innovativeness is the behavior that characterizes the entrepreneur and which reflects his capacity for openness, creativity and sensitivity to reform innovative ideas. Building on the importance of the concept, this study elucidates it in a purely feminist approach. This paper is interested in factors reinforcing the innovativeness among Saudi women entrepreneurs who have not yet set up their own businesses: the reason is that the creation stage helps to elucidate the entrepreneurial behavior leading to the creation of a company (Fassa, 2014). This study is expected to be of considerable importance for scholars and women entrepreneurs. From the academic view, this paper not only contributes to research on female entrepreneurship but the findings propose new insights to develop innovativeness among women entrepreneurs. It permits entrepreneurial support structures to deliver customized help to women-owned firms to improve their innovativeness behavior.

This paper aims to conceive a new integrative research model by introducing some mediating variables not previously considered in the field of female entrepreneurship and for a better understanding of the innovativeness concept. The conceptual framework of innovativeness and its determinants are described in the subsequent sections.

Research model and hypotheses

Psycho-entrepreneurial traits

With the outstanding growth of women-owned firms, several research are focused on psycho-entrepreneurial traits as determinant parameters of women's entrepreneurial success (Chatterjee, Das, & Srivastava, 2019; Ramaswamy, 2013). In this paper, we investigate the direct effect of both two psychological variables: emotional intelligence (EI) and internal locus of control (ILC), and two entrepreneurial traits especially: Entrepreneurial alertness (EA) and Entrepreneurial self-efficacy (ESE), on innovativeness among women entrepreneurs.

Emotional intelligence (EI)

With more research focusing on the relationship between cognitive abilities and entrepreneurial outcomes, we may be able to say that "emotional intelligence" is a key factor to ensure entrepreneurial success among female entrepreneurs (Salleh, Nur Morat, & Baharuddin, 2021). Quintillán and Pena-Legazkue (2019) found that emotional intelligence exhorts the entrepreneurs' decision to internationalize their ventures during economic recession. Moreover, Rodrigues, Jorge, Pires, and António (2019) confirm the impact of emotional intelligence on creativity and entrepreneurial intention among higher education students. Among the few studies done, are those of Dixit and Moid (2016) indicating that women entrepreneurs are generally more hanged to mobilize their emotions in the decision-making process. Moreover, Hanifah, Halim, Ahmad, and Vafaei-Zadeh (2020) argued that emotional intelligence, as a dimension of entrepreneurs' human capital, is a determinant of firms' innovation and performance. Fakhreldin and Hattab (2015) conclude that the success of the company depends on the EI of its creators since it develops behavior based on proactivity and innovation. Gerli and Bonesso (2011) found that entrepreneurs with high emotional intelligence competencies show higher innovative performance. Goyal and Akhilesh (2007) found three abilities contributing to increase the innovativeness of individuals especially:

cognitive intelligence, emotional intelligence and social capital. Furthermore, [Suliman and Al-Shaikh \(2007\)](#) argued in their study of the Middle East organizations that emotional intelligence stimulates creativity and innovativeness. [Ngh and Salleh \(2015\)](#) examine the effect of EI of Malaysian women and men entrepreneurs on their innovativeness. The findings of this empirical study show that the success of the entrepreneur is the result of his creativity and his propensity to innovate and this is conditioned by his level of EI. Recently, [Karia \(2021\)](#) showed that self-innovation as a factor of emotional intelligence has a positive effect on entrepreneurial performance. In sum, the more the entrepreneur has a high level of EI, the more innovative it will be. Accordingly, this study proposes the following hypothesis:

H1. Emotional intelligence (EI) is positively related to innovativeness.

Internal locus of control (ILC)

Those who believe that their own behavior and effort determine the circumstances of their lives are characterized by their internal locus of control ([Rotter, 1966](#)). An entrepreneur should identify and feel in control the required stages in order to achieve his objectives ([Utsch and Rauch, 2000](#)). Moreover, internally controlled entrepreneurs have confidence in their behavior effectiveness and believe that their personal determination is a key factor of their results. Various recent studies on entrepreneurial behavior were performed to investigate the support of ILC for entrepreneurial intention ([Arkorful & Hilton, 2021](#); [Tentama and Abdussalam, 2020](#); [Baldegger, Schroeder, & Furtner, 2017](#); [Auna, 2019](#)), for entrepreneurial success ([Brunel, Laviolette, & Radu-Lefebvre, 2017](#)) and for innovative behavior ([Lingyan, Jianguo, Xiyang, & Keith, 2020](#)).

An empirical study conducted by [Babalola \(2009\)](#) confirms that the strong level of ILC has a powerful effect on entrepreneurial innovative behavior. Women entrepreneurs who believe in their aptitude to control the events of their lives mobilize more know-how to achieve the desired situation and are more innovative than others. Moreover, the study carried out by [Utsch and Rauch \(2000\)](#) shows that ILC is one of the essential psychological traits in determining innovativeness. As a result, those with a high level of ILC are more open to newness and always trying to introduce it. [Eroz \(2017\)](#) approves the linkage between innovativeness and locus of control among 183 Turkish students enrolled in tourism studies. Therefore, this study proposes the following hypothesis:

H2. Internal locus of control has a positive impact on innovativeness.

Entrepreneurial alertness (EA)

[Kirzner \(1979\)](#) has initiated research on the concept of entrepreneurial alertness (EA), which categorized persons having more alert as holders of an “antenna” providing them to recognize market gaps to explore opportunities. The construct of entrepreneurial alertness is the capacity that guides the entrepreneur to mindfully identify and exploit opportunities ([Obschonka, Hakkarainen, Lonka, & Salmela-Aro, 2017](#); [Neneh, 2019](#)). Moreover, [Jiao, Cui, Zhu, and Chen \(2014\)](#) examine the mediating role of entrepreneurial alertness on the relationship between knowledge management and innovativeness. According to them, sources of acquired knowledge and the core social network knowledge affect indirectly the entrepreneurs’ innovativeness through entrepreneurial alertness. Many scholars have argued that entrepreneurial alertness affects positively entrepreneurial intention ([Urban, 2020](#); [Lim, Lee, & Ramasamy, 2015](#)). The literature has shown that individuals having a high level of entrepreneurial passion have more alertness to recognize entrepreneurial opportunities ([Patel, 2019](#); [Gaglio & Winter, 2017](#)). Moreover, [Gozukara and Colakoglu \(2016\)](#) find that the individual’s ability to recognize the available opportunities in his environment reinforces his innovativeness. Based on their study carried out on 150 Chinese

firms, [Zhao, Yang, Hughes, and Li \(2021\)](#) found that entrepreneurial alertness facilitates business model innovation. Recently, [Adomako \(2021\)](#) argued that entrepreneurial alertness affects positively firm product innovativeness. Accordingly, the following hypothesis will be proposed:

H3. Entrepreneurial alertness is positively associated with innovativeness.

Entrepreneurial self-efficacy (ESE)

Another psycho-entrepreneurial trait that has been found to be a powerful predictor of innovative behavior among female entrepreneurs is self-efficacy. This latter represents an individual's belief in the aptitude to successfully reach a projected objective as a result of his actions ([Bandura, 1997](#)). Many scholars argued that the more self-efficacy there is, the more human performance ([Sequeira, Mueller, & Mcgee, 2007](#); [Bandura, Pastorelli, Barbaranelli, & Caprara, 1999](#); [Bandura, 1997](#)). Thus, when an individual is deprived of a high sense of self-efficacy, he has slight motivation to persist and overcome obstacles ([Bandura, 1997](#)). Through their study, [Chen, Greene, and Crick \(1998\)](#) deduce that Entrepreneurial self-efficacy (ESE) characterizes entrepreneurs more than managers. [Krueger and Dickson \(1994\)](#) conclude that the entrepreneur's perception of his or her ability to succeed in the tasks orientates their entrepreneurial behavior. Moreover, [Covin and Slevin \(1991\)](#) found that both self-efficacy and innovativeness as a firm-behavior determinant are very interesting in an entrepreneurial perspective.

[Babalola \(2009\)](#) discusses the determinants of the entrepreneurial innovative behavior of Nigerian women entrepreneurs. The results show that the higher ESE women entrepreneurs have, the more innovative they are: confidence in their ability to succeed leads them to differentiate themselves by their ideas and actions, to adopt a creative approach and to renew themselves. In this sense, [Neck, Neck, Manz, and Godwin \(1999\)](#) demonstrate that the performance of the entrepreneur that corresponds to his risk-taking, his proactivity and especially his innovativeness is determined by his level of ESE. In addition, [Ahlin, Drnovšek, and Hisrich \(2014\)](#) argued that the higher the feeling of ESE in the individual, the more it is oriented toward creativity and innovation. In the Turkish context, [Kumar and Uzkurt \(2011\)](#) indicated that ESE positively affects the innovativeness of professionals. Therefore, the following hypothesis will be examined:

H5. Entrepreneurial self-efficacy positively influences innovativeness.

Social networks

A large literature review in the research field of social psychology recommends that establishing personal relationship with others is commonly considered as a very essential source of information ([Baron, Byrne, & Branscombe, 2005](#)). Moreover, [Sedikides and Gregg \(2003\)](#) argued that individuals could acquire basic comprehension of the external world using information delivered by other persons. Several empirical studies have explored the contribution of social networks in entrepreneurial opportunity recognition ([Ma et al., 2020](#); [Singh, 2000](#)). [Muller and Peres \(2019\)](#) confirmed the effect of social network structure on organizational innovation adoption. They added that relevant information provided by social networks could be of considerable use in improving entrepreneurs' innovative behavior.

Generally, social networks can be divided into four types of social ties: personal social networks (P_NET), business social networks (B_NET), professional forums (P_FORUM) and mentors (MENTOR) ([Ma et al., 2020](#); [Ozgen and Baron, 2007](#)). [Ozgen and Baron \(2007\)](#) found in their study that a vigilant entrepreneur is one who has a high level of Entrepreneurial Self-Efficacy (ESE) developed through his interaction with his personal and professional networks (business, mentors and professional forums). In this study, the authors confirmed a

positive association between P_NET and ESE. Bratkovič, Antončič, and DeNoble (2012) find in their empirical study in Slovenia that entrepreneur’s P_NET can enhance ESE, and thus contribute to their firm growth. In addition, Chen *et al.* (1998) emphasize that environmental support in terms of resources is fundamental to the development of ESE. Fernández-Pérez, Esther Alonso-Galicia, del Mar Fuentes-Fuentes, and Rodriguez-Ariza (2014) found that there is a positive relationship between the level of ESE and both P_NET and B_NET. Mentoring enables the transmission of information and helps entrepreneurs to the improvement of the effectiveness of their entrepreneurial action (St-Jean and Audet, 2012). Also, mentor may facilitate opportunity recognition through entrepreneurial self-efficacy (St-Jean and Tremblay, 2020). Furthermore, Javed, Ali, Hamid, Shahid, and Kulosoom (2016) indicated that the perception of support from social networks (personal, business, mentors and professional forums) reinforces the ESE of the entrepreneur. Accordingly, the following hypotheses are proposed:

- H4a. Personal social networks (P_NET) have a positive effect on entrepreneurial self-efficacy (ESE).
- H4b. Business social networks (B_NET) are associated positively with entrepreneurial self-efficacy (ESE).
- H4c. Mentors (MENTOR) are positively associated with entrepreneurial self-efficacy (ESE).
- H4d. Professional forums (P_FORUM) have a positive impact on entrepreneurial self-efficacy (ESE).

Figure 1 shows the integrated structural model including all mediating constructs.

Research methodology

Measurement development

During the period between December 2020 and early February 2021, we administered the survey by mail to 425 Saudi incubated women entrepreneurs during the pre-creation stage in 13 entrepreneurial support structures especially business accelerators and business incubators. Firstly, the questionnaire return rate was 2.11%. After sending again the

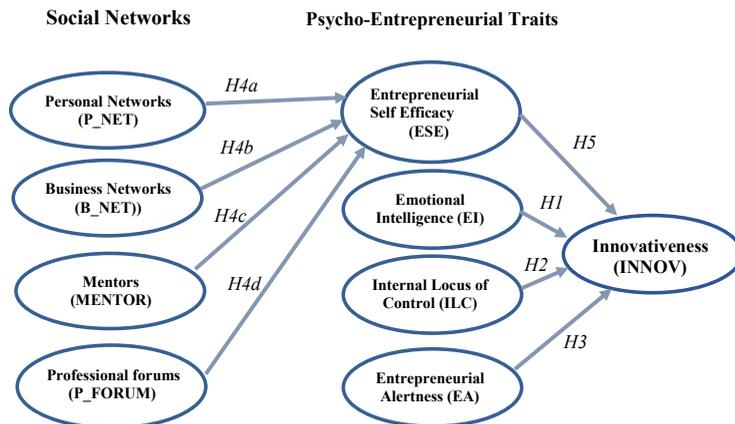


Figure 1.
Structural
research model

Source(s): Figure by authors

survey to nonrespondents, the latter rate has increased one month later by 13.65% to reach 15.76%. After several attempts, the last return rate rises to 70.11% (298 of 425 women entrepreneurs).

Many scholars argued that to get an accurate finding when using structural equation modeling (SEM), the sample size must vary from 200 to 400 units (Hair, Black, Babin, Anderson, & Tatham, 2006; Kline, 2016). Therefore, SEM permits multifaceted modeling of associated predictors. We use SEM methodology because it's suitable for elucidating innovativeness as a complex phenomenon. It is also appropriate when the structural model includes latent or hypothetical constructs related to a non-directly observable variable. Statistical data analysis was performed using SPSS 25.0 software.

Table 1 illustrates descriptive demographic statistics as reported in the questionnaire.

The study found that the majority of the sampled women entrepreneurs are incubated in business accelerator (75.32%), with an age range of 25–40 years (76.64%), where 37.82% of them were married and 24.67% are divorced. While the majority of surveyed women are well-educated (85.85%), a small minority are undergraduated (4.27%). Furthermore, 41.44% of the sample respondents want to operate their business in the service sector, while 28.61% of them are looking to carry on their business in industrial sector. However, 11.51% of women entrepreneurs are oriented toward commerce and 10.19% toward healthcare sector. A small minority of surveyed female entrepreneurs want to start agriculture (1.64%) or tourism business (6.57%).

Measures

Measuring variables reduces their ambiguity since they pass from a latent construct to an observable and measurable one. The questionnaire included 31 questions relating to innovativeness constructs and their determinants. There are nine constructs in this study. For the operationalization of constructs, items were measured using a five-level Likert scale scored from 1 “strongly agree” to 5 “strongly disagree”.

The scale used to measure the construct of innovativeness is a merger between the scale proposed by Peterson and Seligman (2004) and the one proposed by Lee and Ashton (2004). It has been validated by Wagener, Gorgievski, and Rijdsdijk (2010), and an adequate level of

Measures	Items	Frequency	%
Entrepreneurial support structures	Business Incubator	75	24.67
	Business Accelerator	229	75.32
Age	Under 25	35	11.51
	25–40	233	76.64
	40 or above	36	11.84
Marital status	Single	114	37.5
	Married	115	37.82
	Divorced	75	24.67
Educational level	Undergraduate	13	4.27
	Higher Education	261	85.85
	Vocational Training	30	9.86
Business activity	Services	126	41.44
	Industry	87	28.61
	Agriculture	5	1.64
	Commerce	35	11.51
	Tourism	20	6.57
	Health and Healthcare	31	10.19

Source(s): Authors

Table 1.
Sample
description (*n* = 304)

reliability is obtained (Cronbach's α : 0.78). The variable of entrepreneurial self-efficacy (ESE) is measured using the scale proposed by Schyns and Von Collani (2002) and validated by Wagener *et al.* (2010). The value of Cronbach's α is 0.74, which is an index of the scale reliability.

Awwad and Kada (2012) developed the measurement scale of the construct Emotional Intelligence (EI). The Cronbach's α associated with this scale is 0.70, which shows its reliability. The construct Entrepreneurial alertness (EA) is measured by referring to the work of Busenitz and Barney (1997) and validated by other authors (Ko & Butler, 2003; Jiao *et al.*, 2014). The scale of entrepreneurial alertness demonstrated a very good reliability (Cronbach's α : 0.84). This construct comprises four items. The internal locus of control construct scale is proposed by Tsai, Lu, Lin, and Ni (2008) and validated by Hsiao, Lee, and Hsiang-Heng Chen (2015). It comprises three items and demonstrated a fair reliability (Cronbach's α : 0.668). For the social network construct scale is developed by Sequeira *et al.* (2007) and validated by Ozgen and Baron (2007). This scale refers to entrepreneur perception of the support received from various networks, namely: the personal networks that constitute strong links and professional networks (business networks, mentors and professional forums) forming the weak links. The "Personal networks" variable is measured by three items and demonstrated an adequate level of reliability (Cronbach's α : 0.830). While Business Networks scale comprises four items and demonstrated a high reliability (Cronbach's α : 0.831), the Mentors construct is conceived and validated by Ozgen and Baron (2007) including three items and demonstrated a very good reliability (Cronbach's α : 0.956). The variable "Professional forums" refers to the entrepreneur's perception of the support, information provided and skills acquired during participation in seminars, conferences, etc. The scale is adopted from Ozgen and Baron (2007) and it comprises three items. The Cronbach's α associated with this scale is 0.865, thus showing a very high reliability.

Results

Our structural model reveals one latent construct, which is measured by four variables. We use SEM as a flexible method in examining causal associations between several item constructs. Kline (2016) argued that SEM analysis involves flexible rules and less measurement mistakes allowed by many construct indicators. Before testing our latent structural model, we use a process of two stages to identify a measurement model in the confirmatory factor analysis (CFA).

Measurement model validation

We refer to CFA to evaluate the measurement model and confirm its validity and reliability. The initial measurement model shows a satisfactory fit level using the integrity-of-fit indices. As a result, the chi-square ratio is about 1.85, the integrity-of-fit index (GFI) is equal to 0.93, the adjusted goodness-of-fit index (AGFI) is 0.94, the normed fit index (NFI) is 0.95, the Bollen's incremental fit index (IFI) is about 0.96, the comparative fit index (CFI) is about 0.95 and the root-mean-squared error of approximation (RMSEA) is about 0.04.

To examine the internal consistency of a scale, its reliability and its validity, we use Cronbach's α which has to be superior to 0.7 (Hair, Anderson, Tatham, & Black, 1998). Table 2 recapitulates significant reliability of all items and indicates that all indices surpassed the accepted values.

To assess both the discriminant and convergence validity of constructs, we use average variance extracted (AVE). Therefore, each item must have a factor loading greater than 0.7.

Constructs	Items	Standardized item loading	CR	AVE	Cronbach's α	Psycho-entrepreneurial traits & social networks
Innovativeness	INNOV1	0.856	0.8722	0.7321	0.848	
	INNOV2	0.844				
	INNOV3	0.836				
Emotional Intelligence	EI1	0.834	0.9563	0.8869	0.946	
	EI2	0.820				
	EI3	0.930				
	EI4	0.926				
	EI5	0.905				
Internal Locus of Control	ILC1	0.834	0.8412	0.6544	0.804	
	ILC2	0.832				
	ILC3	0.826				
Entrepreneurial Alertness	EA1	0.884	0.8653	0.7311	0.821	
	EA2	0.864				
	EA3	0.841				
	EA4	0.835				
Entrepreneurial Self-Efficacy	ESE1	0.939	0.94221	0.8317	0.922	
	ESE2	0.884				
	ESE3	0.847				
Personal Networks	P_NET1	0.890	0.9201	0.7711	0.823	
	P_NET2	0.877				
	P_NET3	0.872				
Business Networks	B_NET1	0.852	0.9103	0.7503	0.812	
	B_NET2	0.847				
	B_NET3	0.822				
	B_NET4	0.810				
Mentor	MENTOR1	0.841	0.9301	0.7731	0.814	
	MENTOR2	0.832				
	MENTOR3	0.865				
Professional Forums	P_FORUM1	0.852	0.9343	0.7837	0.835	
	P_FORUM1	0.845				
	P_FORUM1	0.821				

Source(s): Authors' calculations

Table 2.
Indices of internal consistency, reliability and validity

For every construct, the composite reliability (CR) must be higher than 0.70 and the AVE superior to 0.5 (Kline, 2016). Table 3 indicates that all CR, AVEs and factor loadings satisfied all required thresholds. Thus, the scale indicates a satisfactory convergent validity.

The discriminant validity reveals the difference between constructs in different structures. Table 3 shows that the discriminant validity is satisfied because the AVE's square root of every construct is superior to the correlation among other constructs in the structural model.

Once finding an appropriate measurement model, we apply SEM methodology to test structural model hypotheses and to verify if the proposed research model reveals the best fitting to the empirical data. Table 4 associates both required and factual fitting indices and indicates that the structural model provides a suitable fit to data (Kline, 2016). In fact, the chi-square ratio is equal to 1.80, the GFI is about 0.92, AGFI is equal to 0.93, NFI is about 0.96, the IFI is equal to 0.97, CFI is equal to 0.97 and RMSEA is about 0.03.

The paper hypothesizes that personality traits variables especially Internal Locus of Control (ILC), Emotional Intelligence (EI) and Entrepreneurial Alertness (EA) would have positive and direct effects on innovativeness. In addition, social network variables

Table 3.
The square roots of AVEs and factor correlation coefficients

Construct	INNOV	ESE	EI	ILC	EA	P_NET	B_NET	MENTORP	P_FORUM
INNOV	0.832 ^{***}								
ESE	0.146 ^{***}	0.918							
EI	0.017 ^{**}	0.106 ^{***}	0.945						
ILC	-0.086 ^{**}	-0.057 [*]	0.001 [*]	0.929					
EA	0.045 [*]	0.054 ^{**}	0.041 [*]	-0.034 [*]	0.916 [*]				
P_NET	0.026 [*]	-0.160 ^{***}	0.049 [*]	0.045 [*]	0.076 [*]	0.902			
B_NET	0.665 ^{***}	0.426 ^{***}	0.238 ^{***}	0.086 [*]	0.225 ^{***}	0.063 [*]	0.813		
MENTORP	0.083 [*]	0.161 ^{***}	0.072 [*]	-0.385 ^{***}	0.013 [*]	0.737 ^{***}	0.154 ^{***}	0.803	
P_FORUM	-0.054 [*]	-0.040 [*]	-0.037 [*]	-0.256 [*]	-0.010 [*]	0.305 ^{***}	-0.018 [*]	-0.303 ^{***}	0.876

Note(s): Values on the diagonal are the AVE's square root between constructs. Nevertheless, values off-diagonal represent correlations among constructs
Source(s): Authors' calculations ^{*}: $p < 0.05$; ^{**}: $p < 0.01$; ^{***}: $p < 0.001$

specifically Personal Networks (P_NET), Business networks (B_NET), Mentors and Professional Forums (P_FORUM) are supposed to effect positively and indirectly innovativeness via Entrepreneurial self-efficacy (ESE). Table 5 recapitulates all results and analysis of the structural model.

Hypotheses H1, H2 and H5 were supported because their path coefficients are highly significant ($p < 0.001$) in the predicted direction. Moreover, the path coefficients were statistically significant ($p < 0.01$) for Hypotheses H3, H4a and H4b, which are supported. Nevertheless, Hypotheses H4c and H4d were rejected. Interestingly, all constructs of psycho-entrepreneurial traits have a positive and direct effect on innovativeness. Consequently, the construct Emotional intelligence (EI) was found to have the largest direct effect on innovativeness ($\beta = 0.469, p < 0.001$) followed by internal locus of control (ILC) ($\beta = 0.434, p < 0.001$) and Entrepreneurial Alertness (EA) ($\beta = 0.209, p < 0.01$). Moreover, the latent construct Entrepreneurial Self-Efficacy (ESE) was found directly and positively associated with Innovativeness ($\beta = 0.568, p = 0.000$). Furthermore, this study does not support the hypothesized relationships between, on one hand, mentors (MENTOR), professional forums (P_FORUM) and, on the other hand, Entrepreneurial Self-Efficacy (ESE). However, it supports the link between Business Networks (B_NET) and Entrepreneurial self-efficacy ($\beta = 0.346, p = 0.002$) and also between Personnel Networks (P_NET) and Entrepreneurial self-efficacy ($\beta = 0.248, p = 0.004$). Consequently, the indirect effect of business networks on innovativeness through entrepreneurial self-efficacy is verified in this study. A full summary of significant relationships between constructs is reported in Figure 2.

Fit indices	Criterion	Measurement model		
		Initial model	Respecified model	Structural model
$\chi^2/d.f$	<3.00	1.85	1.73	1.80
GFI	>0.9	0.93	0.92	0.92
AGFI	>0.9	0.94	0.93	0.93
NFI	>0.9	0.95	0.97	0.96
IFI	>0.9	0.96	0.98	0.97
CFI	>0.9	0.95	0.98	0.97
RMSEA	<0.06	0.04	0.03	0.03

Source(s): Authors' calculations

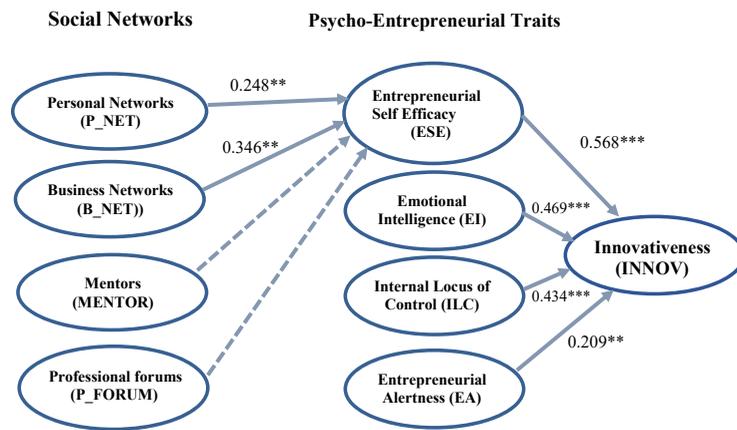
Table 4.
Assessment of model fitting indexes

No.	Hypothesized path	Estimate	S.E.	C.R.	p-value
H1	Emotional Intelligence → Innovativeness	0.469	0.066	5.533	0.000***
H2	Internal Locus of Control → Innovativeness	0.434	0.045	15.632	0.000***
H3	Entrepreneurial Alertness → Innovativeness	0.209	0.017	7.633	0.003***
H4a	Personnel Networks → Entrepreneurial Self-Efficacy	0.248	0.022	5.177	0.004***
H4b	Business Networks → Entrepreneurial Self-Efficacy	0.346	0.011	11.421	0.002***
H4c	Mentors → Entrepreneurial Self-Efficacy	-0.119	0.016	-10.598	0.316 ns
H4d	Professional Forums → Entrepreneurial Self-Efficacy	0.111	0.013	0.034	0.363 ns
H5	Entrepreneurial Self-Efficacy → Innovativeness	0.568	0.012	8.823	0.000***

Note(s): *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; ns: not significant

Source(s): Authors' calculations

Table 5.
Findings of hypothesis testing



Source(s): Figure by authors

Figure 2.
The validated
structural model

Discussion

This paper aims to address the determinants of innovativeness of female entrepreneurship by elucidating the mediating role of entrepreneurial self-efficacy. SEM technique was applied to examine survey data collected from Saudi women entrepreneurs who are in the creation stage of a new business venture. There are three important findings.

First, the paper supports a direct and positive link between emotional intelligence and innovativeness. This finding is in line with the study of [Ihemeje, Adeleke, and Adegun \(2022\)](#) who argued that a rise in emotional intelligence engenders a rise in innovativeness among the staff of tertiary institutions. Furthermore, our finding is similar to those of [Nghah and Salleh \(2015\)](#) who concluded that emotional intelligence makes the entrepreneur more apt to secrete new ideas and be more creative. Our finding is in accordance with those of [Dincer and Orhan \(2012\)](#) indicating that emotional intelligence has a positive effect on innovative work behavior since emotion contributes to innovation by understanding needs and wants of consumers. Moreover, our result is consistent with those of [Karia \(2021\)](#) who confirm that self-innovation as a main determinant of emotional intelligence explains 30% the entrepreneurial performance. Furthermore, [Rodrigues et al. \(2019\)](#), in their study carried on a sample of 345 university students find that emotional intelligence has a direct positive effect on creativity which is also in line with our results. However, our finding contradicts those of [Arthur, Afenya, Larbi, and Aduku \(2022\)](#) who reported no significant relationship between emotional intelligence and employees' creativity and innovativeness. They explain their finding in terms of culture differences.

We found that the internal locus of control ILC is an explanatory factor of innovativeness, which is consistent with the findings of [Ezeh and Abdulrahman \(2022\)](#), [Jaziri and Sakly \(2022\)](#), [Babalola \(2009\)](#) and [Utsch and Rauch \(2000\)](#). Consequently, the woman entrepreneur who believes in her ability to act on the abrupt events that hinder her is more willing to be innovative and creative in order to be able to act and succeed. Also, we confirm the existence of a positive and significant effect between entrepreneurial alertness and innovativeness which is in accordance with the findings of [Gozukara and Colakoglu \(2016\)](#). Furthermore, [Adomako \(2021\)](#) found that entrepreneurial alertness has a significant positive influence on firm product innovativeness by allowing companies to be innovative when there are under extreme strain from customers and competitors. Moreover, our study not only enhances the important work of [Zhao et al. \(2021\)](#) on entrepreneurial alertness as a determinant of business

model innovation but suggests original practical evidence related to the contribution of psycho-entrepreneurial traits for innovativeness as well.

From another perspective, the overall findings regarding the relationship between construct of personal networks (P_NET) and entrepreneurial self-efficacy are consistent with the findings of [Ozgen and Baron \(2007\)](#), [Fernández-Pérez *et al.* \(2014\)](#) and [Javed *et al.* \(2016\)](#). In addition, [Ghiat \(2020\)](#) suggested that social capital is a crucial asset for Muslim women entrepreneurs. Our result is also in accordance with the findings of [Vadnjaj \(2020\)](#) who reported the evidence of the effect of social networks and friends on the innovativeness behavior of Slovenian women entrepreneurs.

The construct business networks (B_NET) are found to be positively associated with entrepreneurial self-efficacy (ESE). Moreover, a woman entrepreneur's interaction with business networks (suppliers, partners, investors and competitors) allows her to believe in her ability to succeed and achieve her goals, and that encourages her to be more creative and innovative. However, mentor support and intervention in P_FORUM do not increase the sense of entrepreneurial self-efficacy. This result is in line with the study reported by [Morched and Jarboui \(2019\)](#) showing that the main determinants affecting the success of women entrepreneurs are self-fulfilment, risk-taking and willingness to be independent. Finally, besides the direct links between Psycho-Entrepreneurial traits and innovativeness, this study has identified an indirect impact of both personal and business networks on innovativeness through entrepreneurial self-efficacy.

Conclusions

The phenomenon of innovativeness among female entrepreneurs is not widely studied in the literature on gender and highlights several significant challenges. The purpose of this study is to understand the concept of innovativeness and scrutinizing its determinants. We apply SEM on an integrated structural model that includes original factors influencing directly and indirectly innovativeness. We conduct a survey among 304 Saudi women entrepreneurs hosted in business incubators. Despite many limitations, this study has generated some interesting theoretical and managerial implications.

The originality of this study lies in the development of a new theoretical framework based on several important constructs that were not previously considered in research on women's entrepreneurship. Moreover, this study allows entrepreneurial support structures such as business incubators to provide personalized assistance to women entrepreneurs to improve their potential innovativeness abilities. This paper identifies factors reinforcing innovativeness and provides recommendations on how to stimulate innovative entrepreneurial behavior in developing countries. It is also interesting to outline that on the empirical level, the sampling choice and the experimental context enrich the previous studies on women's entrepreneurship.

There are several limitations of this study. First, although this research scrutinizes determinants of innovativeness among Saudi women entrepreneurs, it is concentrated mainly on restricted factors such as social networks, human capital, and psychological and entrepreneurial factors. Future studies could focus on additional explicative variables that could better influence innovativeness. This paper is concerned with the person of the entrepreneur, and therefore with individual innovativeness. Thus, future studies could explore organizational innovativeness and its determinants, in a purely feminist context.

Another limitation is related to the research ground. We have opted for a convenience sampling based on public support structures for business start-ups mainly public business incubators under the authority of Ministry of Economy. Future studies could be derived from other entrepreneurial support organizations associated with other ministries (higher education, agriculture, employment, etc.). It is also important to provide some further

comment on the representativeness of the findings. While the size of the sample is deemed as less sufficient ($n = 304$), forthcoming studies could improve data collection from other Saudi regions to find generalizable results. At least, innovativeness is an original and complex social phenomenon. A mixed research approach for data triangulation purpose could be pertinent for better understanding.

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