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Human Capital and Theory of Planned Behavior: Unraveling Entrepreneurial Intentions of IT Students in Pakistan

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Abstract

Human capital variables (such as practical learning, education and experience) affect cognitive decision making abilities of individuals which permit them to identify

entrepreneurial opportunities. Therefore, this study aims to establish an integrated model considering the theory of planned behavior (TPB) and human capital variables considering Pakistan as a sample, especially targeting IT major students. Data for the study were collected from 227 IT major students from seven universities from different provinces of Pakistan. Principal component analysis and hierarchical multiple regression analysis are used for data analysis. The findings of the study confirm the validity of TPB model in predicting entrepreneurial intentions among IT major students. This study further confirms the effect of human capital variables within TPB framework and demonstrates that prior entrepreneurial exposure (PEE) and prior familial exposure (PFE) have an impact on attitude towards entrepreneurship. Furthermore, the relationship of PEE and PFE in predicting entrepreneurial intentions was found insignificant and significant respectively. This is one of the first studies which explore entrepreneurial intentions among IT major students regarding a developing country. Furthermore, this study provides valuable insights to practitioners and educators in Pakistan for consideration of human capital variables' influence on entrepreneurial behavior and entrepreneurial intentions among IT major students.

Keywords: Theory of planned behavior, Entrepreneurial intentions, Human capital, IT major students

1. Introduction

Entrepreneurship has been recognized in creation of economic and social growth, creation of jobs and innovation in the country (Aparicio et al., 2015). Entrepreneurship has also been considered important for society and widely discussed in the literature (Schumpeter, 1934). Recently, public policy has increased its focus in stimulating and developing entrepreneurial activities since they are considered vibrant for the creation of innovation (Brancu et al., 2015). In countries with different levels of economic developments, governments see the entrepreneurship, because of its numerous advantages, as the key to deterioration of different glitches of society, growing self-employment in an economy, national and international level attractiveness and creation of new venture (Adom et al., 2016; Thornton et al., 2011). Prior studies explained that entrepreneurial activities are not high among the highly educated people (Nabi et al., 2010). However, the perception to become an entrepreneur is a more tempting profession to students because it is seen as the independent and valuable profession without losing one's freedom (Autio et al., 2001; de Barros, 2015). According to Qureshi and Mian (2012), firstly, entrepreneurship through its dynamic characteristics can influence Pakistan's economic growth if the entrepreneurial activities are higher among young people. In Pakistan, entrepreneurial activities are need-based rather than opportunity-based, the rate of opportunity-based entrepreneurship is 24 percent and the remaining 76 percent is need-based (Qureshi & Mian, 2012) and total entrepreneurial activity (TEA) rate was 11.57 percent which compared to its peer factor-driven economies and the efficiency-driven economies were low (Qureshi & Mian, 2012). Therefore, the government initiated different policies to enhance entrepreneurial culture among youth (Qureshi & Mian, 2012).

Entrepreneurship research deals with emergence of entrepreneurial opportunities and how these opportunities are implemented and new businesses begin (Shane & Venkataraman,

2000; Kautonen et al., 2011). There has been a long discussion on why some people choose to become self-employed while others do not? Prior researches focus on dealing with these questions and exploring antecedents of entrepreneurial intentions which influence decision towards self-employment (Kautonen et al., 2011; Kautonen et al., 2015; Zellweger et al., 2011). The development of each person's life is constituted through education, personal work experience and socialization which stimulate individual's perceptions towards performing entrepreneurial behavior (Davidsson & Honig, 2003; Hindle et al., 2009; Kautonen et al., 2011; Tarling et al., 2017; Wyrwich et al., 2016; Zellweger et al., 2011). Rastogi (2002) describes this as human capital and defines it as "knowledge, competence, attitudes and behavior embedded in an individual". These human capital variables seem to have direct relationship in influencing individual's perception and intentions towards venture creation (Davidsson & Honig, 2003; Hindle et al., 2009; Li et al., 2018; Miralles et al., 2016). However, despite the growing number of prior studies that explore the influential factors of entrepreneurial intention, there is still a lack of research on human capital variables relating to Pakistani context. Therefore, in this research we considers the human capital variables such as personal work experience and personal familial work experience of students and their impact on students' entrepreneurial behavior and entrepreneurial intentions.

In the same sense, several studies focused on the subjects, approaches, intentions models, intention-behavior link, According to Liñán and Fayolle (2015), little is researched regarding the antecedents of entrepreneurial intentions, educational backgrounds and individual personal characteristics and a linkage between these factors. Several previous entrepreneurship studies conducted on a diverse sample of students and presented a comparison of different field of studies and drew different and interesting results (Teixeira et al., 2017; Wu & Wu, 2008; Zhang et al., 2014). Furthermore, research on the specific educational background is scarce, different researchers such as, Wu and Wu (2008) and Zhang et al. (2014) explain that the specific research related to entrepreneurship considering the educational background is limited and still need to be studied. Several studies have used business, engineering and technological major students as samples in their studies (Linan et al., 2009; Schwarz et al., 2009; Wu & Wu, 2008; Zellweger et al., 2011; Zhang et al., 2014). The IT based businesses has been considered important for economy's growth and well-being (Lee et al., 2011). Therefore, in this study we targeted IT major students and their intentions towards entrepreneurship.

Based on a 2/3rd young population the entrepreneurship can be predicted as the significant contributor towards economic development in Pakistan. For this reason in our study, we develop an intention based framework to predict the entrepreneurial intentions among the IT major students in Pakistan. This study unravels the effect of the human capital variables and provides the deeper understanding of the entrepreneurial process by considering individual' personal learning, skills, education, work experience and socialization (Bae et al., 2014; Hindle et al., 2009) and posits the following research question. *RQ*: Do human capital variables affect IT major students' behavior and intentions towards starting their own business venture? The results of the study provide two streams of theoretical contributions. First, it links the literature on entrepreneurial intentions among IT major students' relating to

Pakistani context. Second stream enriches the existing literature on exploring the role of human capital variables' influence in examining entrepreneurial behavior and intentions. This study also provides insights for policymakers, educators and institutions in Pakistan.

The paper is organized as follows. We first presents the literature review and posits hypotheses, next section describes the methodological section including data collection procedure, sample specification, measures and data analysis approach used in the study. In the third section we present the results and test the hypotheses. The last section explains the discussions followed by implications, limitations and suggestions for the future studies.

2. Literature Review and Hypotheses

2.1 TPB's Applicability in Entrepreneurship Research

The decision to start a new business is thought to be conscious and followed by an intention to do so. Intention can be defined as the person's way of thinking of making one's life goals or setting specific objectives in achieving something (Bird, 1988). Thompson (2009) defined the entrepreneurial intention as person's belief towards establishing a new business enterprise in the future. According to Ajzen (1991), it explains the motivation and inclination towards desired behavior, Krueger et al. (2000) have described that entrepreneurship is a planned and intentional behavior. In entrepreneurship research, entrepreneurial intention has become a vigorous area (Fayolle & Liñán, 2014). The entrepreneurial activity is better explained by intentions and therefore considered important as compared to explain the individual's personality and environmental factors (Krueger & Carsrud, 1993). Kautonen et al. (2015), recently in their longitudinal study has found entrepreneurial intention a significant predictor of entrepreneurial action. Previously, different researchers have given the models for the understanding of the entrepreneurial intentions, in which entrepreneurial event model (EEM) and the TPB measured as the best predictor of explaining entrepreneurial intentions (Kautonen et al., 2015; Hindle et al., 2009). Krueger et al. (2000), tested both models and the results are highly compatible and explained the significant commonalities (Fitzsimmons & Douglas, 2011).

The TPB consisted of the three dimensions, *attitudes towards the behavior, subjective norms and perceived behavioral control*, which influence the entrepreneurial intentions (Ajzen, Kolvereid, 1996; Krueger & Carsrud, 1993; Krueger et al., 2000). The relative importance of these antecedents is supposed to differ across behaviors, cultures, and situations (Ajzen, 1991). According to the TPB, the *attitude towards behavior* is a person's choice about the certain behavior either favorable or unfavorable. the person clearly shows an attitude towards the actual behavior (Kautonen et al., 2015), other defined it as attitude towards becoming the entrepreneur (Maes et al., 2014). Liñán and Chen (2009) explain it as the preferences and advantages and disadvantages. Previous studies confirmed that the attitude towards entrepreneurship is the most influential factor which comprises the desirability of the starting the entrepreneurial career choice (Kautonen et al., 2013) and also showed the positive relationship between attitude towards entrepreneurship and entrepreneurial intentions (Kautonen et al., 2015). *Subjective norms* can be defined as the influential decision of the people in a social environment which includes families, friends, and other close relations,

whether their decision is favorable to become an entrepreneur (Ajzen, 1991). This can also be defined as support or condemnation of the close relations of an individual with relation to starting a business (Liñán & Chen, 2009; Shinnar et al., 2012). Perceived behavioral control can be defined as "person's ease or difficulty in performing the entrepreneurial behavior (Maes et al., 2014; Zhao et al., 2005).

The TPB model has been considered one of the most effective models of human behavior used in every discipline regarding the understanding of the type of the human behavior (Armitage & Conner, 2001), and widely used in predicting entrepreneurial behavior (Kautonen et al., 2015; Krueger et al., 2000; Shirokova et al., 2016). This model is engaged in explaining the entrepreneurial process more clearly (Schlaegel & Koenig, 2014). The business creation process is considered very complex and a single factor cannot become the motivating factor for this act (Krueger et al., 2000); it involves various factors involvement (Fayolle et al., 2014). Several individualistic factors including internal and external considered for the entrepreneurial career decision, and eventually considered substantial in exploring the research on entrepreneurship (Biraglia & Kadile, 2017; Zhao et al., 2005). Therefore, the TPB suggest a highly generalizable, clear, and robust theoretical model for predicting and considering entrepreneurial intentions (Kautonen et al., 2015). In this study, we mainly focus on a comprehensive intentions model based on the TPB. Prior studies relating to Pakistani students considered numerous factors with TPB framework for predicting entrepreneurial intentions (see Table 1). Based on above justifications, we present the following hypothesis:

H1: The antecedents of the theory of planned behavior (H1a) attitude towards entrepreneurship, (H1b) subjective norm and (H1c) perceived behavioral control is positively related to IT major students' entrepreneurial intentions.

Table 1. Review of studies related to Pakistan

Duration (year)	Theoretical backing/ variables	Studies
2010-2015	Governance variables, motivational factors, business development support, university support, personal and contextual factors, self-efficacy, commitment, inclination, media inattention, personality traits, demographic variables and education, culture, TPB,	Ahmed et al. (2010), Ali et al. (2010a), Ali et al. (2010b), Hyder et al. (2011), Sajjad et al. (2012), Ali et al. (2012), Mahmood et al. (2012), Aslam et al. (2012) Tanveer et al. (2013a), Tanveer et al. (2013b), Saeed et al. (2014)
2015-todate	Entrepreneurial motivation, Internship programs and business incubation programs, Intention-action gap considering TPB, TPB and entrepreneurial alertness, Islamic values, ability and opportunity, entrepreneurship education, demographic factors, entrepreneurial self-efficacy and subjective norms, institutional variables, personality traits, organizational and institutional factors, proactive personality and self-efficacy.	Ahmed et al. (2019), Zareen et al. (2019), Alam et al. (2019), Rehan et al. (2019), Hussain, (2018) Raza et al. (2018), Shahid et al. (2018), Mahmood et al. (2018), Farrukh et al. (2018), Anjum et al. (2018), Shah and Soomro, (2017), Samo and Hashim, (2016), Arshad et al. (2016), Hussain and Norashidah, (2015), Saeed et al. (2015), Batool et al. (2015)

2.2 Human Capital and TPB

Human capital can be defined as the practical experience, learning and individuals' education (Becker, 2009; Davidsson & Honig, 2003; Li et al., 2017). These learning experiences of a person are constructed by family, education and work experiences and they ultimately form entrepreneurial behavior (Kautonen et al., 2011). All of these human capital variables draw attention of an individual towards new venture creation (Shane & Venkataraman, 2000; Kautonen et al., 2011). The beliefs, values, and perceptions that made the intentions are affected by several factors which include personal, background, personality and ability of the individuals and also other social, political and cultural factors (Bird, 1988). Shapero and Sokol (1982) also explained that individual's desirability towards the intentions to start a business is influenced by culture, but also by parents, peers, and friends who act like role models. Several

factors may influence the individual entrepreneurial behavior, some explained type of work might influence the attitude towards the behavior (Kautonen et al., 2011). All of these human capital variables may stimulate or hamper entrepreneurship behavior of individuals (Hindle et al., 2009). Human capital theory indicates that both knowledge and experience affects the cognitive decision making process of individuals which permits them to identify more entrepreneurial opportunities (Adom et al., 2016; Davidsson & Honig, 2003; Hindle et al., 2009; Li et al., 2018).

2.3 Prior Entrepreneurial Exposure (PEE)

Liñán, Rodríguez-Cohard, et al. (2011) explained the role of labor experience in explaining entrepreneurial intentions. Studies explained the significant role of prior exposure to entrepreneurial experience in predicting entrepreneurial intentions (Shapero & Sokol, 1982; Kruger, 1993). Kruger, (1993) explained in his study that entrepreneurial experiences significantly influence the entrepreneurial intentions through perceived feasibility. A study conducted in US, students were selected from multiple universities, student's characteristics and entrepreneurial experiences were found positively significant in explaining entrepreneurial attitudes (Harris & Gibson, 2008). Little research has been done in order to examine the effect of different types of experiences that influence entrepreneurial intentions relating to Pakistani students context. Studies showed that individuals with having previous business creation experience significantly a good predictor of defining future entrepreneurial intentions (Davidsson & Honig, 2003; Miralles et al., 2016; Zapkau et al., 2015). Prior experience can be acted as the attractive cause of entrepreneurial confidence and resources. Little or no empirical findings were found regarding the role of prior work experience on students' entrepreneurial intentions regarding Pakistani context. In line with the arguments in literature we posit the following hypothesis:

H2: Personal work experience is positively related to antecedents of the theory of planned behavior (H2a) attitudes towards entrepreneurship, (H2b) subjective norms and (H2c) perceived behavioral control and (H2d) entrepreneurial intentions.

2.4 Prior Familial Exposure (PFE)

The development of experiential and learning skills of individuals is constructed by the process of socialization and influence of familial role models (Hindle et al., 2009; Tarling et al., 2017; Wyrwich et al., 2016). Zapkau et al. (2015) explains that role models add meaningful experience and knowledge, learning which provide individuals with confidence and influence their feasibility and competencies to follow their business intentions (Tolentino et al., 2014). Prior familial exposure has established considerable importance in the literature, and the results have revealed that entrepreneurs were usually nurtured in entrepreneurial families (Crant, 1996). In entrepreneurial intentions models, familial business exposure has been integrated (Krueger & Carsrud, 1993; Shapero & Sokol, 1982), which exhibit that familial entrepreneurial exposure indirectly affect the entrepreneurial intentions via desirability and feasibility. Krueger and Carsrud (1993) in his study found that prior exposure to entrepreneurship was found significant with feasibility and with desirability. Ozaralli and Rivenburgh (2016), explained the role of experinetial activities and familial role models in

predicting entrepreneurial intentions. The familial role models influence the desirability of individual towards entrepreneurship and the social psychology element of role models explains that persons may see entrepreneurship as an attractive career choice if they have a peer engaged in entrepreneurial activities (Fornahl & Brenner, 2003). Studies also explained that the children who grew up with entrepreneurial parents had a stronger tendency towards entrepreneurial career choice (Fornahl & Brenner, 2003; Tarling et al., 2017). Liñán and Fayolle (2015) explained the influence of role models in the family also affects entrepreneurial intentions. Some other considered that individuals who grew up in entrepreneurial families may perceive entrepreneurship as more feasible than desirable (Tarling et al., 2017; Wyrwich et al., 2016; Zellweger et al., 2011). Therefore, we present the following hypothesis regarding a developing country:

H3: Prior familial exposure is positively related to antecedents of the theory of planned behavior (H3a) attitudes towards entrepreneurship, (H3b) subjective norms and (H3c) perceived behavioral control and (H3d) entrepreneurial intentions.

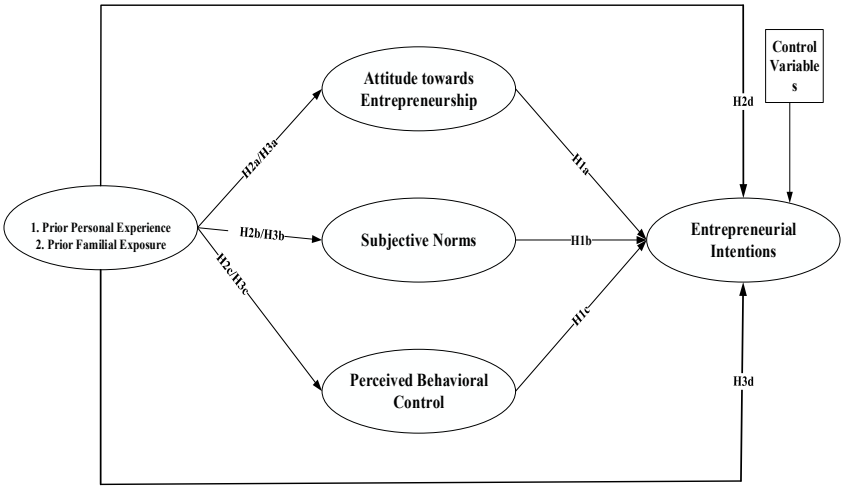

Figure 1. Hypothesizes model based on the human capital and TPB

3. Methods

The data were collected via questionnaire from seven universities in Pakistan: COMSATS Institute of Information Technology; University of the Punjab; Peshawar University; Quaid-e-Azam University; Jinnah University for Women; Bahauddin Zakariya University and Bahria University during October-December 2018. The questionnaire consisted of structured close-ended questions. To lessen the selection bias and geographical bias, the seven universities were comprised of both technological and non-technological universities. In all these universities different study major and courses and specialization are offered, in this study we targeted the students from IT major department. The geographical bias was decreased by choosing universities from different geographical areas of Pakistan, such as,

international capital Islamabad and provincial capitals such as Karachi, Lahore, and Peshawar. In present survey, we distributed 50 questionnaires to IT majored students in each university via multiple techniques of data collection. Previous studies confirmed the sample of students in entrepreneurship research (Liñán & Chen, 2009). The valid responses used for the study was 227, where 59% respondents were female, 67% were master students, and 69.9% were from public universities. Almost 80% of the respondents were lower than 25 years of age. In terms of student's work intentions after study, 36% selected Govt. job as their work profession after their study and 35.7% were having intentions of starting their own business after completion of their study. In order to define the entrepreneurial exposure of students, only 21% students possessed prior work experience and 73% were from non-entrepreneurial families (see detail Table 2).

Table 2. Profile of respondents

Demographic characteristics	Number of students	Percentage of the total number of sample
Gender		
Male	93	41
Female	134	59
Degree		
Bachelor	72	31.7
Master	152	67.0
Other	3	1.3
University affiliation		
Public	158	69.6
Private	69	30.4
Age		
Less than 20	70	30.8
21-25	118	52.0
26-30	36	15.9
Greater than 30	3	1.3
After work		
Govt. Employee	82	36.1
Own Business	81	35.7
Private Job	54	23.8
Other	10	4.4
Prior business exposure/ Work experience		
Yes	48	21.1
No	179	78.9
Prior family business exposure		
Yes	61	26.9
No	166	73.1

3.1 Measures

All the measures used in the administered survey were adopted from the literature representing high Cronbach alpha (α) and validity. Response format for all the measures linked to the TPB was measured on a five point Likert-type scale, where 1= strongly disagree and 5= strongly agree. *Entrepreneurial intentions:* Thompson (2009) defined the entrepreneurial intentions as person's belief towards establishing a new business enterprise in the future. Six items were considered for assessing entrepreneurial intentions of IT students in this research adapted from Liñán and Chen (2009) and Liñán et al. (2011a). *Attitude towards entrepreneurship* consisted of six items adapted from the scale developed by Liñán and Chen (2009). *Subjective norms* were based on three items adapted from Liñán and Chen (2009). *Perceived behavioral control* was measured by six items adapted from Liñán and Chen (2009). *PEE* was measured via single item scale, where respondents were asked "whether they had work experience or have worked or working presently (where; 1=yes; 2=no). *PFE* based on a single question, where respondents were asked "whether your parent had started and run a business before" where (1=yes; 2=no). *Control Variables***:** previous research proposed that demographic characteristics seem to have influence on entrepreneurial intentions (Zampetakis et al., 2017). Therefore, this study considers respondents' demographics as control variables; gender (dummy variable, male=0, female=1), age (<20=1, 21-25=2, 26-30=3 and 31>=4), degree level (bachelors=1, masters=2 and other=3), university affiliation (public=1, private=2), after work preferences (Govt. employee=1, own business=2, private Co. job=3 and other=4).

3.2 Data Analysis Approach

For the data analysis purpose, we applied a three-step method with SPSS software (version 22). First, we performed reliability analysis by calculating Cronbach alpha (α) values for all constructs used in the study. Second, we performed principle component analysis (PCA) for each construct to examine validity of all the items. Third, we analysed the effect of PEE and PFE on three dimenisons of the TPB and entrepreneurial intentions and TPB's dimenions on entrepreneurial intentions. For this we used hierarchical linear regression analysis for testing proposed hypotheses of the study.

4. Results

4.1 Reliability, Validity and Correlation Analysis

Table 3 presents the Cronbach alpha (α) value for all the constructs linked to the TPB. The Cronbach alpha (α) value for entrepreneurial intentions, attitude towards entrepreneurship, subjective norms, and perceived behavioral control are 0.909, 0.889, 0.844 and 0.922 respectively. All values showed an internal consistency of the measures (Hair et al., 2010). For assessing convergent and discriminant validity, PCA result showed that all the items related to the same construct, all constructs are unidimentional. Factor loadings are above 0.5, average variance extracted (AVE) values and composite reliability (CR) are above 0.5 minimum threshold, confirming convergent validity (Fornell & Larcker, 1981). Furthermore, discriminant validity for all the constructs also confirmed as square root of AVE is higher than the correlations among the given constructs (Fornell & Larcker, 1981) see table 4. Table

IV represents the descriptive statistics and correlation analysis of the variables. The results of the bivariate correlation analysis showed that all independent variables are linked to entrepreneurial intentions except PEE. The dependent variable (entrepreneurial intentions) also has significant correlations with control variables; however, the relationship was weaker.

4.2 Hypotheses Testing

Table 5 shows the relationship between the dimensions of the TPB and entrepreneurial intentions (*H1*). The results also represent the relationship of PEE and PFE with antecedents of the TPB (*H2* and *H3*). Model 1 and Model 2 represents the results relating to human capital variables and attitude towards entrepreneurship as dependent variable. Model 1 show the control variables results. The results show that age, after work intentions and university affiliation have significant relationship in explaining attitude towards entrepreneurship. After work intentions and university affiliation have negatively relationship in predicting attitude towards entrepreneurship. The control variables gender and degree type were not significant, stating that the findings of the study were not influenced by gender and degree type. Model 2 show the significant relationship of PEE and PFE with attitude towards entrepreneurship (0.159, $p< 0.05$ and -0.156, $p<0.01$). The R^2 in model 1 and Model 2 is 12% and 16% respectively. Model 3 and Model 4 show the findings of the human capital variables with subjective norms as dependent variables. The findings show the significant relationship with age, after work intentions and university affiliation. The findings of the other control variables gender and degree did not have significant relationship with subjective norms. Model 4 shows that human capital variables and subjective norms are insignificant (0.055, $p>0.10$ and -0.052, $p>0.10$). The R^2 in Model 3 and 4 is 8.4% and 8.8% respectively. Model 5 and 6 show the findings of human capital variables with perceived behavioral control (as dependent variable). Model 5 shows the findings with control variables and found significant relationship of age, degree, after work intention and university affiliation with perceived behavioral control. The results indicated that degree, after work intention and university affiliation had negative relationship with perceived behavioral control and other control variables did not affect the findings of the study. The results in model 6 explain that the human capital variables and perceived behavioral control have insignificant relationship (-0.039, $p>0.10$ and 0.012, $p>0.10$). The R^2 values in model 5 and 6 are 12.8% and 12.9% respectively. Model 7-9 show the findings of the antecedents of the TPB and human capital variable with entrepreneurial intentions. Model 7 shows the findings of the control variables and the results show the significant relationship of degree, after work intention and university affiliation have negatively significant relationship with entrepreneurial intentions. Model 8 show the significant relationship of PFE and entrepreneurial intentions (0.097, $p<0.01$), however, PEE was found insignificant, stating that PEE of respondents not affecting entrepreneurial intentions (-0.029, $p>0.10$). Model 9 shows the results of antecedents of TPB and entrepreneurial intentions; all three intentions were found significant in predicting entrepreneurial intentions (attitude: 0.324, $p<0.001$; subjective norms: 0.163, $p<0.001$; perceived behavioral control: 0.501, $p<0.001$). The R^2 values in Model 7-9 are 9%, 82% and 83% respectively. The findings of this study support *H1, H2a, H3a and H3d.*

Table 3. Reliability and validity analysis

Scale	Scale Items	Factor Analysis	Cronbach alpha (α)	Item-total Correlations	Loadings	AVE	CR
Attitude towards entrepreneurship	A1	KMO 0.861 χ^2 864.819 Sig .000	0.887	0.661	0.808	0.93	0.69
	A2			0.724	0.848		
	A3			0.783	0.871		
	A4			0.784	0.844		
	A5			0.673	0.811		
	A6			0.593	0.794		
Subjective norms	S1	KMO 0.707 χ^2 289.294 Sig .000	0.844	0.660	0.843	0.91	0.76
	S2			0.768	0.906		
	S3			0.702	0.870		
Perceived behavioral control	P1	KMO 0.908 χ^2 968.890 Sig .000	0.921	0.628	0.724	0.94	0.72
	P2			0.748	0.828		
	P3			0.820	0.880		
	P4			0.824	0.885		
	P5			0.819	0.883		
	P6			0.813	0.877		
Entrepreneurial intentions	E1	KMO 0.861 χ^2 864.819 Sig .000	0.909	0.716	0.808	0.93	0.69
	E2			0.771	0.848		
	E3			0.801	0.871		
	E4			0.768	0.844		
	E5			0.726	0.811		
	E6			0.703	0.794		

Table 4 Descriptive statistics and correlations

Variables		1. Deg	2. UA	3. AWI	4. Age	5. GN	**6.** PEE	7. PFE	8. ATE	9. SN	10. PBC	11. EI
N		227	227	227	227	227	227	227	227	227	227	227
Mean		1.7048	1.3040	1.9912	1.8767	.5903	1.7885	1.7313	3.2841	3.1997	3.2761	3.3138
SD		.52049	.46098	.95469	.71193	.4929	.40924	.44427	1.0025	1.0177	1.0112	.97168
Correlation Matrix	**1**	1	-.030	-.052	.331**	-.266**	.059	-.153*	.026	-.016	-.100	-.095
	2		1	.048	.088	.219**	-.010	-.075	-.125	-.152*	.224**	-.152*
	3			1	-.056	-.013	-.045	.021	-.308**	-.217**	-.207**	-.232**
	4				1	-.119	-.044	-.273**	.141*	.109	.065	.068
	5					1	-.015	.020	-.092	-.016	.039	.005
	6						1	.148*	.079	-.043	-.054	-.020
	7							1	.235**	-.054	-.100	.051*
	8								**0.964**	.740**	.706**	.801**
	9									**0.954**	.717**	.767**
	10										**0.872**	.855**
	11											**0.831**

Note: *, ** *Correlations significant at 0.05 and 0.01 level (two-tailed), respectively. Diagonal values are the square root of AVE, representing discriminant validity.*

UA=university affiliation, AWI= after work intention, GN=gender, EIs=entrepreneurial intentions, ATE= attitude towards entrepreneurship, *SN= subjective norms and PBC=perceived*

Table 5. Hierarchical multiple linear regression

		Control Variables						Main effects									
		Constant	Age	Deg	AWI	GN	UA	PEE	PFE	ATE	SN	PBC	R	R^2	Adjusted R^2	ΔR2	F Value
DV-ATE	Model 1	3.570***	0.043*	-0.103	-0.354***	-0.135	-0.242*						0.359	0.129	0.109		6.530***
	Model 2	3.853***	0.041*	-0.215	-0.345***	-0.105	-0.346*	0.159*	0.156**				0.402	0.162	0.135	0.33	6.030***
DV-SN	Model 3	3.372***	0.044*	-0.137	-0.251**	0.037	-0.356*						0.290	0.084	0.064		4.071**
	Model 4	3.452***	0.043*	-0.175	-0.248**	0.047	-0.390*	0.055	-0.052				0.297	0.088	0.059	0.004	3.019**
DV-PBC	Model 5	3.684***	0.052*	-0.288*	-0.237**	0.152	-0.549***						0.357	0.128	0.108		6.466***
	Model 6	3.823***	0.051*	-0.269*	-0.238**	0.148	-0.542**	-0.039	0.012				0.359	0.129	0.101	0.001	4.617***
DV-EI	Model 7	4.450***	0.108	-0.143*	-0.257***	0.003	-0.159*						0.314	0.098	0.078		4.828***
	Model 8	0.451*	0.107	-0.141*	-0.250**	-0.002	-0.151*	-0.029	0.097**				0.908	0.824	0.817	0.726	127.535***
	Model 9		0.102	-0.139*	0.249**	-0.004	-0.150*	-0.026	0.096**	0.324***	0.163***	0.501***	.911	.830	.822	.006	105.713***

**p<0.05, ** p<0.01, *** p<0.001, (two-tailed)*

Note: UA=university affiliation, AWI= after work intention, GN=gender, EI=entrepreneurial intention, ATE= attitude towards entrepreneurship, *SN= subjective norms,*

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5. Discussion

The current study shows that the TPB is frequently recognized and used in entrepreneurship research and can be helpful in predicting entrepreneurial intentions (Munir et al., 2019). The purpose of the current study was to examine the entrepreneurial intentions of IT major university students in Pakistan. The results showed the consistency of the TPB and all antecedents of the TPB significantly contribute to explaining the entrepreneurial intentions among IT students relating to Pakistani context. Previous studies also show the consistency of the TPB in predicting entrepreneurial intentions among students from various disciplines regarding Pakistani context (Alam et al., 2019; Farrukh et al., 2018; Munir et al., 2019). The role of subjective norms in explaining entrepreneurial intentions differ across cultures and its effects on intentions according to the characteristics of the students. Rather than, it could be more culture-specific and influenced by values (Liñán & Chen, 2009). The relative strengths of the attitude towards entrepreneurship, subjective norms, and perceived behavioral control is explained according to the culture of the county and specific context, previous studies showed the different results for subjective norms and attitude towards entrepreneurship (Liñán & Chen, 2009; Liñán et al., 2011; Moriano et al., 2012). However, in this study, we found significant relationship of three antecedents of TPB in predicting entrepreneurial intentions among IT major students relating to Pakistani context.

The role of human capital variables which includes prior work experience and prior familial exposure has a partial impact on the antecedents of the TPB and also significantly explaining entrepreneurial intentions directly. This may conclude that the prior work experience involves negative experiences and feelings which decline the entrepreneurial intentions. However, the existence of entrepreneurial/ business owner father was found to be linked to a positive attitude towards entrepreneurship (Basu & Virick, 2008). In the present study, we found the strong relation of familial business exposure of students in explaining entrepreneurial intentions as well it has strong positive relation with attitude towards entrepreneurship. Furthermore, the prior personal work experience was found insignificant in predicting entrepreneurial intentions and it has negative significant relation with attitude towards entrepreneurship. The IT students in Pakistan may have previous bad experiences towards entrepreneurship profession, however, students from entrepreneurial families showed positive relationship towards entrepreneurial behavior.

6. Conclusion

This study aimed to examine the role of human capital variables within the TPB model and further to explore entrepreneurial intentions and validity of TPB model among IT major students in Pakistan. This study targeted both technological and non-technological universities and collected 227 valid responses from IT major students in Pakistan. Then this study used hierarchical multiple regression analysis to justify the proposed hypotheses.

This paper confirms the applicability and validity of the TPB model in the Pakistani student's context, using the sample of IT major students from seven different universities. Our results show the consistency of the TPB in predicting entrepreneurial intentions and confirm the significant correlation of attitudes towards entrepreneurship, perceived behavioral control,

and subjective norms with entrepreneurial intentions. The findings of our study show the consistency with previous studies (Iakovleva et al., 2011; Munir et al., 2019). The results of our study add meaningful knowledge to the literature exploring the role of human capital in entrepreneurial intentions among IT major students, one cannot neglect the role of human capital (PEE and PFE) while predicting entrepreneurial intentions. Furthermore, the study also adds meaningful results relating to the familial work experience, which explained that, students whose parents are entrepreneurs have positive feelings towards entrepreneurship. In our study, we found significant relationship between human capital variables and attitudes towards entrepreneurship as well as with entrepreneurial intentions.

This is the first study of its nature which explains the entrepreneurial intentions of IT major students in Pakistan and also elaborates the role of human capital variables on the dimensions of the TPB. Comprehensive generalizability of the findings can also be measured by taking the large sample and examining the cultural values in other universities as well.

Although the results of this study provide useful findings, several limitations of the study must be stated. First, in the current research, we took students as respondents, which could limit the generalizability of our findings to the other individuals. Secondly, we did not make our study longitudinal to track the actual behavioral intentions of the students. Thirdly, we did not compare the results at provincial level due to a small sample. We suggest that studies in future could be carried on a large sample and longitudinally so that the actual entrepreneurial behavior of the students can be compared and differences in regional level can also be identified. Future studies could focus on other groups such as entrepreneurs and nascent entrepreneurs. Researchers could also use the other human capital variables such as personal skills and entrepreneurship education using several other statistical techniques such as path analysis or structural equation modeling techniques to further establish and strengthen the relationship between variables.

7. Implications

The current study provides the several theoretical implications. First, it is related to the confirmation and consistency of the TPB in predicting entrepreneurial intentions among technology major students in Pakistan. It contributes to provide evidence that the TPB is valid framework in order to predict intentionality and also confirms its validity across samples from different fields of study. Secondly, this study suggests that the consistency of the TPB might be helpful not only to assess the intentions but also to predict the other variables' impact within this framework (Kautonen et al., 2013; Krueger et al., 2000; Shirokova et al., 2016). Thirdly, this study strengthens the existing literature relating to human capital variables and TPB in predicting entrepreneurial intentions specifically related to IT major students in Pakistan.

Our results have implications for the policymakers, institutions and for educators. Educators should effort to enhance the entrepreneurship education among non-business students, especially for technology major students. Policymakers at government level can enhance the entrepreneurial activities at the institutional levels by creating the culture of entrepreneurship education among students. With proper education, budding entrepreneurs can create

opportunities, enhance their skills and gain new experiences relating to business activities, which could help in new venture creation, its success and performance. Our results indicate that the experience has negatively influencing entrepreneurial intentions, the bad experiences could reduce entrepreneurial behavior among students, however; policymakers could also promote the training programs/internship programs and business incubation facilities and entrepreneurship education for all faculty disciplines especially to non-business students such as IT, which could lead towards enhancing their learning and business experience.

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