

THE IMPACT OF ENTREPRENEURS' IMPROVISATION ON INNOVATION: THE MEDIATING ROLE OF RESILIENCE

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Abstract

This study was planned to test an empirical investigation of the mediating role of Resilience on the relationship between Entrepreneurs' Improvisation and Innovation in small and medium enterprises of Pakistan. The purpose of this research was to analyze that whether Entrepreneur Improvisation impact innovation in SME's of Pakistan. Data was collected by adopting clusters sampling technique of probability sampling design (based on area) from the managers/owners of small and medium size enterprises (SME's), listed in Chambers of Commerce of Capital cities of Pakistan. This study is a part of extensive research and data was collected from 433 respondents with 73.33% response rate. Structural equation modeling (SEM) was used to test the hypotheses and path analysis. The results of the study showed that entrepreneurs' improvisation has direct significant impact on innovation and resilience; and the resilience fully mediated the relationship between entrepreneurs' improvisation and innovation which contributed in the existing body of knowledge as there is scant evidence in literature regarding full mediation of resilience on the relationship between entrepreneurs' improvisation and innovation in context of SMEs. This research paper also suggested to the future researchers to test and analyze other mediators like adhocracy culture etc. in SMEs or large scale organizations.

Keywords: Entrepreneur Improvisation, Resilience, Innovation

1. Introduction

In this age of continuously changing business environment, businessmen need something of value to compete and innovate. Improvisation is relatively a new concept to cope with the changing business conditions, which was used in late 1980's first time in organizational settings as the concept of improvisation derives from jazz improvisation (music band) and theatre improvisation later on. Improvisation is described as "the spontaneous and creative process of attempting to achieve an objective in a new way" (Vera & Crossan, 2004) or a "deviation from existing practice and knowledge, occurring in organizations in problem circumstances" (Chelariu, Johnston, & Young, 2002). Improvisation does not guarantee success every time, it can create, resolve or even worsen the problem. To successfully improvise, various factors such as expertise, quality work force and real time information and communication is needed (M. M. Crossan & Sorrenti, 2002).

Entrepreneurs' improvisation is comparatively new research arena. Previously, research articles which were published in late 1980's and early 1990's used jazz improvisation as a symbol of improvisation in organizations (Bastien & Hostager, 1988; Moorman & Miner, 1998). Afterwards, metaphor of theatrical improvisation used for improvisation in organizations (M. Crossan, Cunha, Vera, & Cunha, 2005; Vera & Crossan, 2004). Empirical research has been done by few researchers to study how improvisation occurs in practice and

articles have been published in which organizational improvisation link with other research domains like intuition, bricolage, organizational learning and crisis management (M. Crossan, et al., 2005; Leybourne & Sadler-Smith, 2006; Moorman & Miner, 1998; Rego & Cunha, 2008; Vera & Crossan, 2004; Weick, 1993). Hypothetical examinations researched the connection among act of spontaneity and vulnerability ((Mary M Crossan, Lane, White, & Djurfeldt, 1995; Pina e Cunha, Vieira da Cunha, & Kamoche, 1999), utilized improvisational jazz and theater execution as analogies for the variables. Exact studies found that improvisation is frequently utilized in the regions of new invention (Moorman & Miner, 1998) and advancement (Brown & Eisenhardt, 1997), just as in situations described by quick innovative change, in rebuilding forms (Van den Bergh & Engelbrecht, 2006), and in the pioneering setting (Baker, Miner, & Eesley, 2003).

The entrepreneurial improvisation tends to play a crucial role in enhancing the innovativeness of the firm because entrepreneurs with higher improvisation ability tend to show higher responsiveness to unplanned events and dynamic environmental changes through innovative ideas and approaches. The improved entrepreneurial improvisation is the ultimate source of innovation because the ability of entrepreneurs to learn and innovate enhances due to higher improvisation. This academic research will enhance the knowledge base on innovation by studying the impact of entrepreneurs' improvisation on innovation through mediation of resilience in small and medium sized enterprises of Pakistan. This research paper will be helpful for the entrepreneur to change traditional strategy to improvisation in order to be innovative in the contemporary business environment.

The purpose of the study is to identify the relationship between entrepreneur improvisation and innovation in SMEs of Pakistan. This research also aims to explain the impact of resilience on innovation of the firms. Furthermore, this study is also designed to analyze whether resilience mediates the relationship between entrepreneur improvisation and innovation.

Research questions that are going to be answered in this research study on the basis of objectives of the study are as follow: (1) Up to what extent entrepreneur improvisation impact innovation in SMEs? (2) Does entrepreneur improvisation impact entrepreneur resilience in SMEs of Pakistan? And (3) Does the entrepreneur resilience mediates the relationship between entrepreneur improvisation and innovation in SMEs of Pakistan?

2. Literature Review

2.1 Entrepreneur's Improvisation

The entrepreneurial improvisation is recognized as an important strategy to deal with dynamic environment effectively nowadays. There are various studies available in the literature that use entrepreneurial improvisation as an important strategy needed to be adopted by entrepreneurs to cope with uncertain events like (Arshad, Julienti, Bakar, Ahmad, & Hassan, 2015; L. Hu, Gu, Wu, & Lado, 2018; Miner & O'Toole, 2020). Entrepreneurship is full of risks and uncertainties. Pre-formulated plans have no more use in the organizations due to many threats and rapidly change in business conditions, entrepreneurs must be extemporaneous enough to make response in each situation to remain in the world of competition (Hughes, Hodgkinson, Hughes, & Arshad, 2018). Improvisation can serve an important mean of innovation in organizations by increasing entrepreneurial orientation in organizations. In the study conducted by Gojny-Zbierowska & Zbierowski, (2021), researchers argued that the improvisation plays moderating role in determining entrepreneurial orientation which is essential for innovation in medium and large scale organizations. The findings of their study interpreted that bricolage and creativity which are important dimension

sof improvisation have positive and significant impact on innovativeness of the firms. Tions Their research has repercussions for theory of responsile innovation in firms by improvisation(Gojny-Zbierowska & Zbierowski, 2021). In 21st century, organizations must improvise strategically rather adopting traditional planning as the environment is much turbulent than ever. It is important to understand the mechanics of strategic improvisation and competitive advantage for the firms. Strategic improvisation is a real time learning process and can be defensive or offensive (Yu & Yu, 2021). Strategic improvisation is directly positively related to the competitive advantage of the firms for sustainable development goals (Yu, Zhang, Yu, Yang, & Mardani, 2021). Organization's orientation towards strategic improvisation adds more to achieve creative goals and to take risk by adapting to the frequent changes in the business environment (Mohammeda, Taherb, & Azeez, 2020). Strategic improvisation is also a financial bootstrapping strategy. It has contributed towards financial performance of the firms during adverse economic situations or economic crises. It is evident that improvisation has a significant and positive effect on financial performance of the company during financial crises (Al Issa, 2020). Strategic improvisation has also direct positive relationship with total quality management and performance of small and medium sized enterprise. Policy makers should adapt improvisation strategy to boost performance of their firms (Zarooni & A., 2021).

There are many antecedents and consequences of improvisation which has been studied time to time. In entrepreneurship the concept of improvisation has gained momentum in few years. A study conducted on women entrepreneur specifically in Malaysian SME's shows that improvisation has mediating role in women's entrepreneurial success. Researchers concluded that improvisation is a key factor for success of any enterprise (Baria & Arshadb, 2020). Researchers argue that the entrepreneurial improvisation helps the enterprise to achieve a number of positive outcomes including the change management, innovating organizational practices, improving flexibility, and achieving goal of innovation (e Cunha, da Cunha, & Kamoche, 2002; Hughes, et al., 2018; Ibrahim, Mahmood, & Bakar, 2016). Among different benefits and outcomes of entrepreneurial improvisation, the innovation is a prominent outcome because entrepreneurial improvisation assists the enterprise to timely identify the opportunities existing in the new changes and market trends and then respond to those trends through quick planning and actions. Therefore, it can be said that the entrepreneurial improvisation serves as a mean to bring innovation particularly in turbulent environment (Liu, Lv, Ying, Arndt, & Wei, 2018). Improvisation is behavioral and cognitive activity to achieve some objectives, suggesting deviations from existing plans or knowledge (Chelariu, et al., 2002)whereas, resilience is the characteristic of a person to look beyond experiences or expectations (to expect the unexpected) (Hollnagel, Woods, & Leveson, 2006). An essential principle of resilience is 'requisite imagination' and improvisation backs this principle by adapting flexible behavior in order to accomplish goals in a new way. Improvisation is very important for resilience in terms bricolage which is an important component of improvisation. In order to assist successful improvisation, there should be training programs for entrepreneurs to enhance the ability of trainees to anticipate the unexpected situation (i.e. resilience). Improvisation and resilience are two intertwined concepts and improvisation is considered a source in the literature. The current study tends to shorten the gap in the literature of entrepreneurial improvisation by explaining its part in driving enterprise's innovation and by analyzing the relationship between improvisation and resilience. Following hypotheses may be drawn based on the above mentioned theoretical premise

H1: Entrepreneurs' Improvisation has a significant positive effect on Innovation.

H2: Entrepreneurs' Improvisation and resilience are positively related.

2.2 Resilience

According to American Psychological Association (2014), “Resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress — such as family and relationship problems, serious health problems or workplace and financial stressors”. It means ‘bouncing back’ from problematic practices. Resilience is basically ability to expect the unexpected and imagination is a key factor for resilience (Grøtan, Størseth, Rø, & Skjerve, 2008). According to (Fletcher & Sarkar, 2013), Workplace resilience is an ability of a person to manage and to cope with unfavorable situation at work. Researchers have been considered resilience as a key trait to maintain performance during adverse times. Most of the researchers’ view that during adversity, resilience may be adapted which results in positive outcome (Alliger, Cerasoli, Tannenbaum, & Vessey, 2015; Fletcher & Sarkar, 2013). Resilience has negative and positive effects on different variables in the literature. For instance, according to (Shatté, Perlman, Smith, & Lynch, 2017) resilience has a negative effect on psychological stress whereas positive effects on well-being of worker and on task performance (Ceschi, Demerouti, Sartori, & Weller, 2017) and work engagement as well. There are two points of views regarding resilience. First one considers resilience as a fixed and stable individual trait and the second one takes resilience as dynamic and frequently changing trait (Lee et al., 2013). Lengnick-Hall et al. (2011) indicated in their research that the organizations can develop capabilities in their key employees to enhance organizational ability for resilience. Resilient organizations have commonly four basic capabilities i.e; adaptability, cohesion, efficiency and diversity that enable innovation in organizations (Groenendaal & Helsloot, 2020).

There are many unforeseen events which have great impact on the organizations; therefore, various organizations have embraced approach of organizational resilience to deal with these high impacting events. According to (Groenendaal & Helsloot, 2020), efficient business continuity management capability can be helpful for predicting risks and anticipated improvisation strategy have implications for unpredictable events. Both strategies are part of organizational resilience and necessary for entrepreneurs or policy makers to accept and promote less planning and showing more trust towards expertise of such trained managers. There are two sources of resilience i.e. anticipation and improvisation. Anticipation is the ability to predict future happenings in order to avoid failure whereas; improvisation is an ability to combine new ideas with past experience to successfully cope with uncertain. A research conducted in USA reveals that if an organization tends to predict future to avoid failure, it should adapt and create the ability of anticipation. But if that organization wants to be resilient to cope with uncertain situation, it should adapt improvisation along with anticipation (Rerup, 2001).

Improvisation and resilience are two interrelated concepts and basically improvisation is a source of resilience in literature for an organization to make innovation. This paper will identify the mediating role of resilience between entrepreneurs’ improvisation and innovation. Hence, following hypothesis is drawn:

H3: Resilience significantly mediates the relationship between Entrepreneur’s Improvisation and innovation.

2.3 Innovation

Innovation has been defined by different past researchers and most of them define the innovation as the process of converting the creative ideas into something of monetary value. It means that they regard the innovativeness as the ability of transforming the creative information and knowledge available to the company into some innovative product, process,

method, or tool having better monetary value (J. Zeng, Zhang, Matsui, & Zhao, 2017; S. X. Zeng, Xie, & Tam, 2010). According to (Chaudhry, Aftab, Arif, Tariq, & Roomi, 2019), innovativeness of the firm is its ability to transform creative ideas and information into something of monetary value because innovation is the ultimate predictor of profitability and financial performance of the firm. While discussing the enterprise's innovation, the innovation is classified into different categories. The review of literature shows that the innovation of the firm has been described and classified differently by different prior studies. For instance, some studies examine the innovation in a single generic perspective e.g. (Abrunhosa & Sa, 2008) while some studies have examined the innovation in different and more than one perspectives e.g. (Abrunhosa & Sa, 2008). Most of the studies examining the innovation as the combination of different types of innovation use the classification of innovation performed by "OECD Oslo Manual". This classification of innovation has been done by distinguishing between four key types of innovation that are, "process innovation, product innovation, marketing innovation, and organization innovation". Studies using this classification tend to examine the innovation of the firm in these particular perspectives in order to evaluate the overall innovativeness of the firm (Kafetzopoulos, Gotzamani, & Skalkos, 2019; Mortensen & Bloch, 2005).

The innovativeness of a firm is derived by a number of factors that play crucial roles in enhancing the innovation performance of the firm. For instance, knowledge management, organizational learning, leadership, organizational culture, industrial revolution, environmental fluctuations etc. There are different studies found in the existing literature that highlight and explain these determining factors of innovation in the organization e.g. (Liao, Chang, Hu, & Yueh, 2012; Liao & Wu, 2010; Noruzy, Dalfard, Azhdari, Nazari-Shirkouhi, & Rezazadeh, 2013). Therefore, firms need to focus on these important factors and areas for sake of innovation in the organization. Among different factors deriving innovation in the organization, environmental turbulence is an important factor, which has gained a little attention in the existing literature. However, there is a strong need to efficiently explain the phenomenon through which environmental turbulence can lead the organization towards innovation. Given the great role of innovativeness of the firm in driving its effectiveness, performance, and success, past researchers have attempted to find out and discuss different determining elements that can lead the firm towards the innovativeness and help it to develop innovation capability. Among different factors, institutional factors including normative, mimetic, and coercive factors have been embraced as substantial predictors of enterprise's innovation by many prior studies. Institutional theory provides the viewpoint that different types of institutional pressure including coercive power (governmental enforcement, regulations, policies etc.), normative factors (norms, standards etc.), and mimetic elements (e.g. competitors) lead the firm to adopt certain behavior or change (Powell & Colyvas, 2008; Suddaby, 2010). These institutional forces can also lead the firm to bring innovation. For instance, when an organization is working under turbulent environment, which is characterized by dynamic changes and environmental uncertainties, then it becomes necessary for an organization to adopt innovative methods and tools to cope with contemporary challenges

Another key factor having the potential to influence the process of innovation within enterprises is the entrepreneur resilience (ER), which refers to the flexibility and ability of entrepreneur to adapt the change and break the status quo. Resilience means to regain the original shape of the thing after its deformation, bending and stretching. The entrepreneurial resilience refers to the ability and capacity of the entrepreneur to find the solution of the problem and to make things correct by using fruitful strategies (Corner, Singh, & Pavlovich, 2017). It is the responsibility of the entrepreneur to make his business continuous even in

hard situation and set back all the operation of the company. It means that it is the competence of the entrepreneur that how he handles the difficult situation and make it safe from the failure (Branicki, Sullivan-Taylor, & Livschitz, 2018). Moreover, entrepreneurial resilience is the powerful alteration procedure that makes entrepreneurs able to change the whole stressful and challenging scenario into a pleasant one by looking forward as well as it allows them to not leave their strength after facing the tricky tasks (Verreynne, Ho, & Linnenluecke, 2018).

3. Research Methodology

Research philosophy refers to the system of dealing with the assumptions and beliefs regarding the creation of knowledge. It determines the way the researcher perceives the reality and thus, the individual's views about the world because the individual's views are linked with the way in which the reality is perceived by that individual (Bryman & Bell, 2014; Saunders, Lewis, & Thornhill, 2009). It means that the research philosophy is about the assumptions made by the researcher for completing a study and studying a phenomenon. As far as the research philosophy of the current study is concerned, it is positivism because the current study undertakes the assumptions of positivism. It is because the present study just needs to evaluate the effect of entrepreneurial improvisation on enterprise's innovation with the intermediating phenomenon of resilience in context of Pakistan. For this research, researcher need objective data and information for generating statistical and quantifiable results through which he/she can predict the proposed relationships. Research approach which is going to be used by the researcher for this study is deductive approach as the researcher needs to test the hypotheses formulated on the basis of literature.

This study is quantitative in nature which used numeric data to derive results. Data may be collected through observations, interviews, questionnaires and surveys depending upon what kind of research question are and what type of the study is going to be conducted (Uma Sekaran, 2003). Cluster sampling technique of probability sampling design based on areas was used to collect data from managers/owners of SMEs listed in Chambers of Commerce of Capital cities of Pakistan for this study and 590 respondents were randomly selected from area based clusters of capital cities of Pakistan registered with Chambers of commerce. The unit of analysis for this research paper shall be the managers, owners or directors of SME's as they have primary responsibility for making decisions related to the adaption of strategy to develop ability of resilience and to make innovation in SMEs. Data was collected from the respondents through 5-point-Likert Scale anchored by 1 (strongly disagree) and 5 (strongly agreed) through quantitative survey, 433 responses were received which shows 73.33% response rate. This study ensures minimal interference of the researcher at work place of the respondents (U Sekaran, 2003).

This is a primary type of research as the data has been collected from primary sources through questionnaires. Questionnaire was developed by using 5 points Likert scale comprising 29 items; out of which 12 questions are related to Entrepreneurs' improvisation (Hmieleski & Corbett, 2006), 5 questions are concerned with Innovation (Atalay, Anafarta, & Sarvan, 2013) and 12 items are related to resilience adapted from "Nicholson McBride Resilience Questionnaire" (NMRQ). The scale for the research was adapted for each construct from well-established studies. Demographics include; gender, actual age, marital status of the respondent and the establishment size (manufacturing, trading or services) of SME.

The data in the current study was mainly analyzed statistically through SPSS and AMOS. The data collected in form of close-ended responses through questionnaires was put into Statistical Package for Social sciences (SPSS) in which the descriptive analysis of the data was performed. Through descriptive analysis, the adequacy and normality of the data was checked. The model under the examination of the current study is assessed by applying structural equation modeling (SEM) in Analysis of Moment Structure (AMOS). Structural equation modeling (SEM) technique was used to test the hypotheses and path analysis because SEM is very well recognized in social sciences and management sciences as it simultaneously uses structural and measurement (Vasile, 2012).

4. Results and Analysis

4.1 Descriptive Analysis

Descriptive analysis includes interpretation of demographical information used in the questionnaire to determine the impact of demographics on the variables of the study. Through descriptive analysis, the adequacy and normality of the data was checked. It includes demographical analysis (i.e. frequency and percentage) and the normality analysis like mean, standard deviation, skewness and kurtosis etc.

4.1.1. Demographical Analysis

Demographical information is extracted from the fully filled questionnaires which were received back using Statistical Package for Social sciences. Results are given as under;

Table 1: Demographical Analysis

Characteristics	Classification	Frequency	Percentage
Gender	Male	174	40.2
	Female	259	59.8
	Total	433	100
Age	20-30	232	53.6
	31-40	58	13.4
	41-50	87	20.1
	51-60	56	12.9
	Total	433	100
	Marital status	Married	221
Single		212	49
Total		433	100
Establishment Status	Manufacturing	129	29.8
	Trading	146	33.7
	Services	158	36.5
	Total	100	100

Frequencies and percentages of gender, age, marital status and nature of enterprise/establishment size are calculated by using SPSS. Data is collected from 433 respondents which comprises of 174 males and 259 females. 232 entrepreneurs were fresh and young lying within the age group of 21-30 years, 58 were up to 40, 87 were up to 50 and

56 were up to 60 years. 221 respondents are married and 212 are single. Age analysis shows that all the respondents are in the age bracket of 23-54 and highest 13.4% respondents are of age 26. Out of 433 respondents, 129 belong to manufacturing sector, 146 from trading business and 158 from service providing enterprises.

4.1.2. Normality Analysis

Normality analysis ensures that the collected data is normally distributed for further analysis. It includes mean, standard deviation, skewness, kurtosis, correlation analysis, reliability and validity analysis. According to (Blumer, 1979), skewness value of the data must be within +1 and -1. Kurtosis estimates must lie between +3 and -3 for normal data (Balandam and Mac Gillivray, 1988). Table 2 is showing that the skewness and kurtosis values of each item of the measuring scale fall within limits. Hence, the data for this study is normally distributed and fit for further analysis.

Table 2: Data Skewness, Mean and Kurtosis

Items	Mean	Std. Deviation	Skewness	Kurtosis
E11	3.6975	1.08799	-0.948	0.281
E12	3.8453	1.16928	-1.023	0.215
E14	3.8637	0.89619	-0.95	0.996
E15	3.8753	1.01295	-1.05	0.819
E16	3.8106	1.11852	-1.057	0.478
E18	3.6697	1.02489	-0.795	0.172
E110	3.5797	1.13804	-0.704	-0.252
E111	3.7598	0.98721	-0.896	0.455
E112	3.8083	0.89377	-0.826	0.753
R2	3.7436	1.00984	-0.661	-0.111
R7	3.7737	1.16847	-1.039	0.304
R8	3.8776	0.97718	-0.979	0.494
R9	3.8499	0.97568	-0.897	0.538
R10	3.7067	1.01351	-0.714	0.035
R11	3.7182	1.09039	-0.736	-0.141
I1	3.9607	0.84208	-0.86	0.702
I2	3.7737	0.97636	-0.838	0.426
I3	3.9607	0.99342	-0.96	0.593
I4	4.0208	1.03281	-1.308	1.351
I5	4.0393	0.89279	-1.077	1.315

Correlation analysis shows that there is a significant and positive relationship exists among all the constructs of the study ("Pearson's Correlation Coefficient," 2008). Table 3 depicts that the value of Pearson's correlation coefficient i.e. ($r = 0.706$) showing positive and significant association between entrepreneurs' improvisation (EI) and resilience (R). Similarly other values of ($r = 0.596$) and ($r=0.744$) reveal that there is positive and significant relationship exist between entrepreneurs' improvisation (EI) and innovation (I); and resilience (R) and innovation (I) respectively. All the relationships among variables of the study are significant at 0.01 level of significance.

Table 3: Correlation Analysis

Sr. No.	Variables	1	2	3
1	Entrepreneurs' Improvisation	1		

2	Resilience	0.706***	1	
3	Innovation	0.596***	0.744***	1

****.** Correlation is significant at the 0.01 level (2-tailed).

Validity and reliability of the data is demonstrated in table 4. It reveals the loading of all the items is greater than .30 which means that all the items are loaded well on their respective constructs. Threshold value of Composite Reliability (CR) must be higher than 0.7 to ensure Convergent Reliability (Pandey & Shrivastava, 2016) of the measure. CR values for all the constructs of the study are greater than .7 which means that the Convergent validity of the constructs is established. The reliability explains the study variables' consistency, everytime the scale gives the same or nearly same results, even in unlike conditions (Bell, Bryman, & Harley, 2018). Cronbach's alpha approach has been chosen for the current research study to check the variables' reliability. According to (Hair, Ringle, & Sarstedt, 2013), values of Cronbach's alpha for each variable of the study should be higher than 0.60. On another side, some researchers argue that values up to 0.50 are acceptable but not good enough (Risal et al., 2015). The range of Cronbach's alpha values is between 0-1 (Cronbach, 1951). Cronbach's Alpha values of all the constructs as mentioned in table are higher than 0.70 which shows that measures are internally consistent, and the overall measuring instrument is reliable enough.

Table 4: Reliability Analysis

Variables	Cronbach alpha
Entrepreneurs' Improvisation	0.837
Innovation	0.781
Resilience	0.783

4.1.2.1. Discriminant Validity

The degree to which the variables of a research vary is called as discriminant validity of the instrument (Carmines & Zeller, 1979). According to Hair et al. (2014), the degree to which a measure of the study differs from another study measure in an empirical research framework. Discriminant validity for this research paper was measured through the new HTMT (heterotrait-monotrait ratio) criteria which is comparison of the heterotrait-heteromethod and the monotrait-heteromethod correlations (Henseler, Ringle, & Sarstedt, 2015). HTMT approach to discriminant validity is different from traditional approaches named as Fornell-Larcker criterion and the assessment of cross loadings due to high sensitivity rates and specificity. Threshold value for strict discriminant validity is 0.850 and for liberal discriminant validity is 0.900 (Henseler, et al., 2015). It can be observed in Table 5 that there are no warnings for this HTMT analysis.

Table 5: Discriminant Validity

HTMT Analysis			
	EI	I	R

EI			
I	0.636		
R	0.713	0.760	

4.1.2.2. Test of Multicollinearity

Table 6 shows the collinearity statistics for the IV i.e. entrepreneurs' improvisation and mediating variable i.e. Resilience. Less than 5 value of VIF demonstrates no multicollinearity among variables of the study as a general threshold (Haitovsky, 1969), if VIF ranges 5-10 then moderate problem of multicollinearity exists but is the value of VIF greater or equal to 10 then there is severe problem of multicollinearity exists. It can be seen from table 6 that values of VIF for both variables are less than 5 which means there is no multicollinearity issued in the model variables.

TABLE 6: Collinearity Statistics

Variables	Tolerance	VIF
Entrepreneurs' Improvisation	0.248	4.032
Resilience	0.248	4.032

4.2. Structural Equation Model (SEM)

Testa (2001) defined as, SE modeling is a multivariate statistical procedural approach to analyze the proposed models. There are two models in SEM; the measurement model, and the the path model or structural model (Anderson & Gerbing, 1982). The researcher in the field of social science mostly used SE modeling because it can separate the observational error by computing the latent variable. Therefore, for the current study, SE modeling is used to analyze the collected quantitative data. This technique is useful in social science because it evaluates the multiple regression equations at the same time. Further, SE modeling examines the suitability of the proposed theoretical model of study. AMOS 26 was used to apply SE modeling for the current study. Confirmatory Factor Analysis (CFA) is done to prove the convergent validity and composite reliability of the data. Discriminant validity is established by taking root mean square of AVE and bivariate correlation. Overall health and fitness of the model is tested by calculating CMIN/DF, GFI, AGFI, RMR, CFI and RMSEA values. Direct effects and mediation analysis are performed for hypotheses testing which are described below in detail.

4.2.1 Confirmatory factor Analysis

Confirmative Factor Analysis (CFA) is an evaluating model and a form of structure equation model. CFA was done with the help of Amos 26 to analyze individual factors. Confirmatory factor analysis (CFA) explains covariance (Marsh, Balla, & McDonald, 1988) or linearity of the relationship in a model (Shook, Ketchen Jr, Hult, & Kacmar, 2004). CFA design is in such a way that explores the conduct of ‘group variables,’ which is covariance structure and relationships between these groups of constructs (Thompson & Daniel, 1996). Further, it also explains the reliability and validity of the scale (Carmines & Zeller, 1979). It is used for validation of the structural conformation of adopted factors. It also confirms the theoretical measurement model based on previous literature, whether it is fit or not. Hypothesized structural model is showing in Fig. 1 in which loading of all the items has been shown which is greater than 0.30 which means that all the items are well loaded on each constructs.

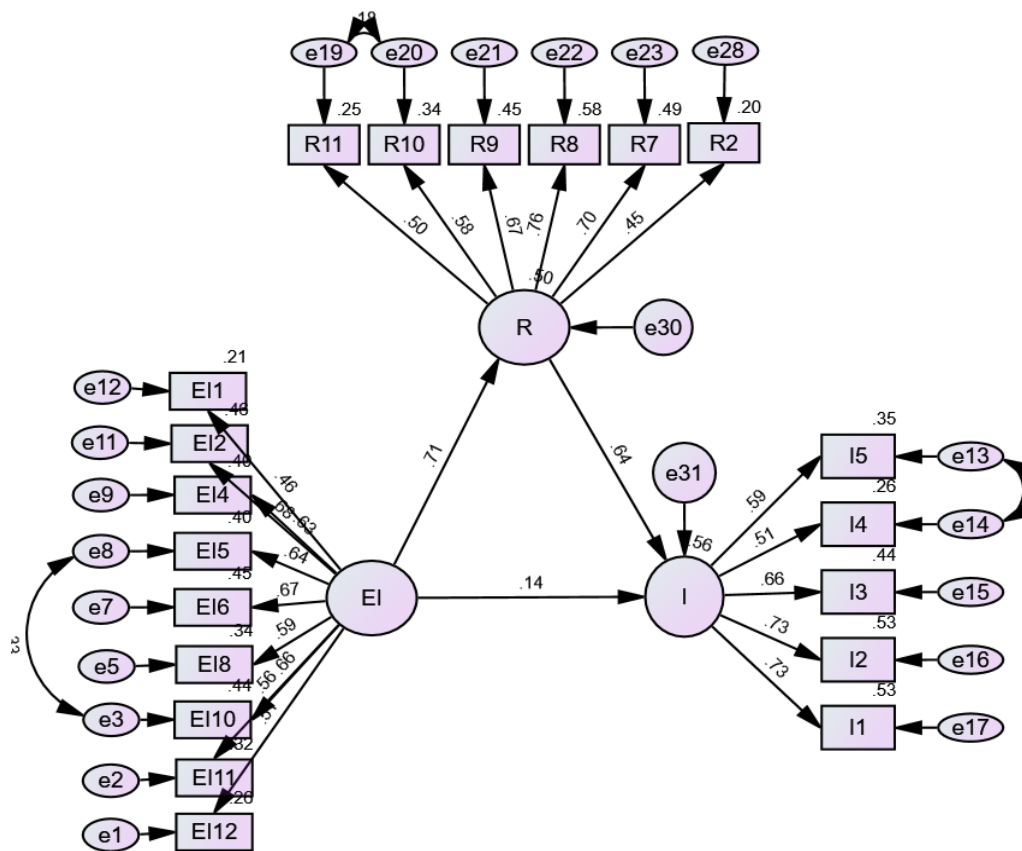


Figure 1: Hypothesized Structural Model

4.2.2. Model Fitness Summary

Table 7 shows the overall model fitness summary for the study showing overall health of model. Value of CMIN/DF is 2.721 which should be less than 5 for acceptance (Gaskin & Lim, 2016). Value of RMR for the model is 0.062 which should be closer to zero according to (Gaskin & Lim, 2016). GFI (goodness of fit index) value of the model is .903 (should be greater than or equal to .90) and AGFI (adjusted goodness of fit index) value is .875 (should be greater or equal to .80). Both values for the model are greater than their respective thresholds which indicates good health of the model (L. t. Hu & Bentler, 1999). CFI value of the model is .902 which should be the greater or equal to .90 it also depicts the good health of the model. The value of RMSEA (root mean square error of approximation) should be less than .08 for the fitness of the model and less than 0.06 is excellent. The value of RMSEA is

0.063 which is near to excellent for model health (L. t. Hu & Bentler, 1999). Model fitness summary reveals that the model is fit for onward advance analysis i.e. to test the hypotheses of the research and to draw inference for the research conducted.

Table 7: Fitness Summary

Measure	Estimated Value	Thresholds
CMIN/DF	2.721	< 5
RMR	0.062	Closer to 0
GFI	0.903	≥ 0.9
AGFI	0.875	≥ 0.8
CFI	0.902	≥ 0.9
RMSEA	0.063	< 0.08

4.2.3. Hypotheses Testing

Direct Effects

As all the considerations for model's fit are fully gratified, structural model in AMOS is developed in order to analyze the relationship among variables of the study. Table 8 displays the direct relationship of independent variable (Entrepreneur's Improvisation) and dependent variable (Innovation). Entrepreneur's Improvisation has positive and significant effect on Innovation ($\beta = 0.59, p < 0.001$) and Entrepreneur's improvisation has significant and positive influence on resilience ($\beta = 0.71, p < 0.001$). Therefore, hypotheses H₁ and H₂ are confirmed.

TABLE 8: Direct Effect

Hypotheses	Estimates	p-value	Result
H ₁ : Entrepreneur's Improvisation—Innovation	0.59	***	supported
H ₂ : Entrepreneur's Improvisation – Resilience	0.71	***	supported

*** p -value < 0.001

Mediation Analysis

Mediation effect and path analysis was done in AMOS 26 and followed approach of Baron and Kenny (1986). Mediation is a hypothesized link that explains the effect of one variable on another that in turn affects a third variable in a chain manner (Baron & Kenny, 1986). Mediating variable is the one which mediates the relationship between independent variable and a dependent variable in a research model (Burcio, Silva, & Salgueiro, 2014). Structural equation modeling (SEM) or series of regression analysis both can be used to evaluate the mediating effect of mediator. We have used SEM technique to validate mediation. Table 9 explains the summary of mediation effect and path analysis. Mediation analysis has been done to find out the impact of mediating variable (Resilience) on the relationship between independent variable (Entrepreneur's Improvisation) and dependent variable (Innovation). Entrepreneur's improvisation showed a significant positive influence on resilience ($\beta = 0.71, p < 0.001$) and entrepreneur's improvisation has also significant and positive direct effect on innovation without mediating variable ($\beta = 0.59, p < 0.001$) as shown in table 8. However, entrepreneur's improvisation did not show any significant effect on innovation in the

presence of mediating variable of resilience ($\beta=0.14$, $p=0.148$). Thus, entrepreneur's improvisation has indirect effect on innovation ($\beta=0.454$, $p<0.001$), confirming the full mediating effect of resilience on the relationship of entrepreneur's improvisation and innovation in SMEs of Pakistan. Therefore, H_3 is also confirmed.

Table 9: Mediation Analysis

Path hypothesis	of	Direct β (without mediation)	Direct β (with mediation)	Indirect β	Mediation observed	Result
H_3 : EI----- R ----I		0.59***	0.14 ^a	0.454***	Full mediation	Supported

*** p -value <0.001 , ^a insignificant (p -value =0.148)

5 Contribution, Recommendations and Conclusion

5.1 Contribution

Entrepreneur improvisation is relatively a new concept and growing rapidly in many small and medium enterprises as well. This research confirms the role of resilience as the bridge connecting (mediator) the entrepreneur's improvisation to innovation. Possibly the most important finding could therefore be decided as a theoretically and empirically confirmed link of entrepreneur's improvisation, resilience, and innovation. The analysis of the hypothesized research model showed important accomplishments about the study of entrepreneur's improvisation, resilience, and innovation relationship. Since estimated coefficient of entrepreneur's improvisation was insignificant in the presence of resilience, it was concluded that resilience worked as a full mediator between entrepreneur's improvisation and innovation. This research paper would be a fruitful addition in the literature due to the fully mediating effect of resilience because yet to best our knowledge no study is available validating the mediating effect of resilience on the relationship of entrepreneur's improvisation and innovation. This study will make practical contribution in a way that the entrepreneurs can make innovation by adapting the ability of resilience in their enterprises. The consequences of this research will also help the academic circles and SMEDA to understand the significance of entrepreneur improvisation and resilience which leads organization towards innovation and to survive in the dynamic business environment.

5.2 Recommendations

Future studies may be conducted by taking antecedents of improvisation like organizational crisis, organizational change etc. and future researchers may also use other consequences of improvisation instead to innovation like adaptive performance, financial growth, competitive advantage etc. as improvisation is just like a skill or tool and does not always guarantee success (Vera & Crossan, 2004). In future, researchers may test the mediating role of other variables like organizational culture and availability of information etc. on the relationship of improvisation and innovation. Besides that future research may also be conducted in large scale industries to get more generalized results.

5.3 Conclusion

As the environment is changing rapidly all over the business world, businesses must have knowledge and strategies to cope with those unexpected events in the business world. This study was designed to empirically investigate the role of entrepreneur's improvisation on

innovation in the presence of resilience as a mediating variable in SMEs of Pakistan. All of three hypotheses which were formulated on the basis of research questions and available literature are accepted. The findings of this study reveal that entrepreneur's improvisation has significant impact on innovation which is fully mediated in the presence of resilience; and the results of the study will be helpful for the academic world, entrepreneurs and SMEDA to understand the significance of entrepreneur's improvisation and resilience to make innovation.

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