Research Methodology

CHAPTER III

RESEARCH METHODOLOGY

The present study aims to examine the impact of emotional intelligence on work engagement and subjective well-being of women entrepreneurs in SME sector at Coimbatore city. This chapter details with the research methodology for the present study. It explains the suitable methodology to achieve the research objectives.

3.1 Area of the Study - Coimbatore

The third largest city of the state, Coimbatore, is one of the most industrialized cities in Tamil Nadu, known as the textile capital of South India or the Manchester of the South. The city is located on the banks of river Noyyal. As Cauvery River has nurtured musicians and Thamiraparani River has fostered freedom fighters, Noyyal River in Coimbatore has honed up entrepreneurs in this region. Natives in this region have an inborn flair towards entrepreneurship and admire taking up risky and challenging business ventures.

Coimbatore is one of the entrepreneurship hub for the development of MSME sector in our Country. It is one of the industrially developed and highly vibrant district in Tamil Nadu, known for textiles, pump sets, grinders and other manufacturing industries dealing with varied engineering goods. They are spread out in almost all business sectors from pin to plane industry. This study is aimed at studying the level of emotional intelligence and analyzing its impact on work engagement and subjective well-being of women entrepreneurs with reference to MSME sector in Coimbatore.

3.2 Research Design

This research is a descriptive and a causal study aimed at exploring the impact of emotional intelligence on work engagement and subjective well-being of women entrepreneurs. Descriptive research also known as statistical research, explains data and characteristic features about the population or phenomenon being studied. This is where the research is helping the researcher to describe what is happening in more detail, filling in the missing parts and expanding the understanding. Descriptive research helps to collect as much information as possible, instead of making guesses or elaborate models to

answer the questions of who, what, where, when and how part of the problem. The time period for data collection was from August 2013 to May 2015. The methodology comprises model validation, sampling, data collection and data analysis.

3.3 Instrument Development

Data was collected through primary and secondary data. Primary data was collected through survey method, employing a well-structured questionnaire. The Questionnaire was intricately developed to know in detail about the women entrepreneur, focusing on demographic details, business related particulars, motivational factors to start the business, barriers faced by them, their involvement in social activities and standard tools with statements to measure their emotional intelligence, work engagement and subjective well-being. Secondary data was collected through magazines, newspapers like 'The Hindu', web sites of MSME-DO, DIC, Annual reports from MSME (2012-2013 and 20113-2014), journals and so on.

Measuring Emotional Intelligence

Three main approaches emerged: the ability model, the trait model, and the mixed model. The ability model focuses on how individuals process emotional information and the analysis of the capabilities that are required for such processing (Brackett & Salovey, 2006; Mayer & Salovey, 1997; Mayer et al., 1999). The trait model views the construct as a personality trait encompassing a constellation of emotion-related dispositions and self-perceptions (Petrides *et al.,* (2001, 2003) and Wolff (2005) and conceptualizes emotional intelligence as a lower order trait. Finally, the mixed model combines emotional abilities with personality dimensions such as optimism and self-motivation (Bar-On, 1997, 2006; Goleman, 1998). Several research studies have used different tools to measure emotional intelligence. Some of them are:

1. EQ-I (Bar-On, 1997)

Aruna *et al.,* (2011) and Van Rooy et al., (2004) in their research study on emotional intelligence have used Reuven Bar-On's EQ-I, which is a a self-report test designed to measure competencies including awareness, stress tolerance, problem solving, and happiness. According to Bar- On, "Emotional intelligence is an array of

non-cognitive capabilities, competencies, and skills that influence one's ability to succeed in coping with environmental demands and pressures."

2. Multifactor Emotional Intelligence Scale (MEIS):

An ability-based model, developed by Mayer, Caruso and Salovey (1999) in which test-takers perform tasks designed to assess their ability to perceive, identify, understand, and utilize emotions.

3. Seligman Attributional Style Questionnaire (SASQ):

It was originally designed as a screening test for the life insurance company Metropolitan Life, which measures optimism and pessimism. This tool was used by Banefsheh *et al*., (2014) to study the attributional style and emotional intelligence of female high school students in Ahvaz.

4. Schutte Self Report Emotional Intelligence Test (SSEIT) (1998):

The Schutte Self Report Emotional Intelligence Test (SSEIT) is a 33 item self-report measure of Emotional intelligence developed by Schutte *et al.,* (1998) and used by Banefsheh et al., (2014) to study the attribution style and emotional intelligence of female high school students in Ahwaz. The SSEIT has been designed to map into the Salovey and Mayer (1990) model of Emotional Intelligence. Items of the test relate to the three aspects of EI:

a. Appraisal and expression of emotion

b. Regulation of emotion

c.. Utilization of emotion

5. Genos Emotional Intelligence Scale:

Palmer *et al.,* (2001) and Chin *et al* (2001) has developed 'Genos emotional intelligence scale', a construct that has 64 statements, divided into five dimensions. The five dimensions comprises of emotional recognition and expression, understanding others emotions, emotions direct cognition, emotional management and emotional control".

6. Wong and Law Emotional Intelligence Scale:

Wong and Law developed a self-report EI scale named as the Wong and Law EI Scale (WLEIS) based on the work of Mayer and Salovey (1990). The WLEIS contains 16 items Likert-type self-report statements. Studies done by Karim (2010), Mulla *et al.,* (2008) and Kim and Agrusa (2011) provided evidence for the reliability and validity of the WLEIS scale. Besides that, the WLEIS was developed through Chinese respondents in Hong Kong, which would be a better starting point for other Asian cultures than EI scale originated in the Western countries (Wong, Law, & Wong, 2004).Wong and Law (2002) explained that EI is an ability to understand situations and they suggested that EI consists of four dimensions namely -emotion appraisal, use of emotion, self-emotion appraisal, and regulation of emotion.

7. Mayer-Salovey-Caruso-Emotional Intelligence Test (MSCEIT):

Paul (2011) and Thor (2012) has used Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), a mixed model, to study the emotional intelligence and leadership style in Australian Educational institutions. The Mayer, Salovey, and Caruso Emotional Intelligence Test (MSCEIT) developed by Mayer, Salovey, Caruso and Sitarenios in the year 2003. It is a 141 question assessment that uses a combination of questions and images to determine emotional intelligence of individuals.

The MSCEIT measures emotional intelligence in the four branches that include perceiving emotions, using emotions to facilitate thought, understanding emotions, and managing emotions (Mayer *et al*., 2003). Each of the four branches is measured using two methods. Pictures and faces are used to measure perceiving emotions; facilitation and sensation tasks are used to measure facilitating thought; change and blend tasks are used to measure understanding emotions; and emotional relationships and emotion management tasks are used to measure managing emotions. This tool was also employed in the research studies carried out by Samanvitha *et al.,* (2012).

Emotional recognition and expression – discusses the capability to recognize one's own emotional state and the skill to prompt those innermost feelings to their colleagues. Understanding others emotions refers to the capacity of the individual to classify and apprehend the feelings of others. Emotions direct cognition denotes the

reactions and expressive information that are combined in administrative and or problem solving circumstances. Emotional management refers to the talent to cope with feelings both within oneself and others. Emotional control denotes to the individual's knack to successfully regulate extreme emotional situations experienced at work

8. Emotional Competency Inventory-360, Version 2.0

Wolff (2005) used Emotional Competency Inventory-360, Version 2.0 developed by Daniel Goleman, Richard Boyatzis and Hay group to study emotional intelligence in his research study. The ECI is a trait based, 360-degree tool designed to assess the emotional competencies of individuals and organizations. It is based on emotional competencies identified by Dr. Daniel Goleman in *Working with Emotional Intelligence* (1998), and on competencies from Hay/Mc Ber's *Generic Competency Dictionary* (1996) as well as Dr. Richard Boyatzis's Self-Assessment Questionnaire.

It has seventy three statements to measure the emotional intelligence of the respondents under two dimensions viz. personal factors and social factors. Personal factors comprise of two components namely, self-awareness and self-management. Social factors comprise of two components including social awareness and social skills or relationship management. This tool has employed five point scale ranging from never, rarely, sometimes, often and always to record the response of the entrepreneurs with regard to eighteen emotional competencies. This existing research study resorted to using Emotional Competency Inventory-360, Version 2.0, as it was found to highly applicable for studying the emotional intelligence of individuals in work place and organizations.

The ECI is unique from other measures of emotional intelligence because of the 360 degree assessment format, which is argued to provide a more reliable and valid measure of emotional intelligence (Wolff, 2005). Goleman, Boyatzis and Hay group studied the internal consistency of the tool and the Cronbach's alpha value for the competencies in the Emotional Competence Inventory tool is presented in the table 3.1 below.

Table 3.1 Illustrates the internal validity analysis of the instrument as reported by Goleman, Boyatzis and Hay group in their research report.

Table 3.1 Cronbach's alpha value of the ECI-360, Version-2.0

ECI 2.0 Cluster	Emotional Competency	Cronbach's alpha value (N=22089)
Self-Awareness	Emotional Self-Awareness	0.87
	Accurate Self-Assessment	0.77
	Self-Confidence	0.79
Self- management	Emotional Self-Control	0.83
	Transparency	0.68
	Adaptability	0.73
	Achievement	0.77
	Initiative	0.70
	Optimism	0.75
ECI 2.0 Cluster	**Emotional Competency**	**Cronbach's alpha value**
Social Awareness	Empathy	0.80
	Organizational Awareness	0.80
	Service Orientation	0.86
Relationship Management	Developing Others	0.85
	Inspirational Leadership	0.86
	Change Catalyst	0.82
	Influence	0.76
	Conflict Management	0.73
	Teamwork and Collaboration	0.75

Utrecht Work Engagement Scale

This standardized tool was developed by Kahn to study the level of work engagement of individuals under three dimensions namely- dedication, absorption and vigor, using seventeen statements. Thus, Utrecht Work Engagement Scale (UWES) is a standard tool used to measure the work engagement of entrepreneurs. It is designed to measure engagement based on vigor, dedication, and absorption (Schaufeli *et al.*, 2004). Each question is based on a seven point scale ranging from "never" to "always every day".

Six questions relate to vigor, five for dedication and six for absorption. Questions related to vigor focus on energy, resilience and endurance. Individuals who score high in vigor typically demonstrate passion and persistence in their work. Dedication is assessed through questions centering on enthusiasm and finding meaning in work. Scoring high in dedication signifies an individual finds their work challenging, rewarding and of great value. Absorption questions center on being drawn into one's work. A high score in absorption describes an individual who is consumed by their work and feels happy while in such a state of involvement.

This instrument demonstrates good reliability with a Cronbach alpha of 0.80 to 0.90 and a test-retest reliability of 0.63 to 0.72 for all questions, 0.64 to 0.71 for vigor, and 0.58 to 0.69 for dedication and absorption. (Schaufeli *et al*., 2004). The UWES also has good construct validity (Seppala *et al*., 2009) and factorial validity (Nerstad *et al.,* 2010). Confirmatory factor analysis on the UWES demonstrates the three factor structure is better than a single factor (Schaufeli *et al.,* 2004). The correlations between vigor, dedication and absorption range have been found to be quite high (r = 0.65).

Considering this, Schaufeli *et al.,* (2006) suggests that total engagement score is a better measurement than the individual vigor, dedication and absorption scores. The discriminant validity of the UWES has been studied with personal initiative (Salanova *et al.,* 2008 and Sonnentag, 2003), job involvement and organizational commitment (Hallberg *et al.,* 2006).

Subjective well-being

Subjective well-being has been measured using different tools in several research studies. Oxford Happiness inventory, a 29-item questionnaire is used to measure subjective well-being on a seven point Likert scale (Argyle, *et al.,* 1989). Emma Kowal, Wendy Gunthorpe and Ross S Bailie used Negative Life Events Scale (NLES), to measure the social and emotional subjective well-being of Aboriginal population in Australia. It helps to measure the level of stress through a set of yes/no questions and helps to assess the emotional and social subjective well-being. The study brought out the need for emotional and social subjective well-being for the physical subjective well-being, family and work relationships and the performance of the aborigines.

The five item Satisfaction with life scale was developed by Diener *et al.*, in 1985 to measure the life satisfaction on a cognitive-judgmental process over a seven point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Higher score indicates higher satisfaction whereas lower satisfaction indicates lower satisfaction. This existing research study employed four statements on a six point scale to study the subjective well-being of individuals based on the review of literature collected from the previous studies. In tune with the Judgmental model proposed by Schwarz *et al.*, (1999), which emphasize on using a person's experience to judge the situation, women entrepreneurs were asked to evaluate their satisfaction and happiness in their work and family life through four simple and direct statements. The four statements intended to measure the subjective well-being of women entrepreneurs focusing on their satisfaction towards the work, accomplishments, fulfilment and happiness in their work. The questionnaire has been pre-tested in a pilot study and thus validated to meet the accuracy and reliability.

3.4 Instrument validation

The instrument was administered to sixty women entrepreneurs identified from the sampling frame of the District Industries Centre, Coimbatore for the pilot study. Questionnaire was distributed and the demographic particulars and responses for the variables were entered in IBM SPSS. The entered pilot data was used in ensuring the reliability and validity of the instrument. The empirical study was analyzed using SPSS and AMOS.

3.4.1 Reliability analysis:

Reliability refers to the consistency or stability of measures or observations. Essentially, if a person is measured twice on the same measure it should roughly yield the same score both times and then it is said to be reliable. When assessing the reliability of the tool, two indicators are provided.

1. Test-retest reliability: Test-retest reliability refers to the stability of a measure over time. The survey is administered twice to the same individuals with a period of time between assessments and correlations are computed to determine how stable the test is from one administration to another. It is a tool to measure the external reliability, which

is less applied as the respondents do not show enough interest to fill the questionnaire for the second time in retesting the tool. Generally, researchers use internal consistency to test the reliability of the tool.

2. Internal consistency: Internal Consistency refers to the average of the inter-correlations among all the single test items. Cronbach's alpha is the most commonly used indicator of internal consistency. This procedure estimates reliability from the consistency of item responses from a single assessment. This research study has used internal consistency to measure the reliability of the tool. Though this present research study has adopted this standardized tool for assessing the emotional intelligence of women entrepreneurs, it has also used internal consistency to check the reliability of the tool. Seventy three statements with personal and social factors under four constructs namely self-awareness, self-management, social-awareness and social skill or relationship management were tested for reliability with a pilot data of 60 samples using SPSS (Statistical Package for Social Studies) for data analysis.

Table 3.2 Reliability analysis- Emotional Intelligence- Cronbach's alpha value

S.No.	Categories	Cronbach's Alpha	Number of Items
1	Personal factors (Self-awareness and Self-management)	0.800	36
2	Social factors (Social awareness and Social skills)	0.871	37
3	Overall reliability of Emotional Competence Inventory	0.913	73

Table 3.2 exhibits that this tool to measure the emotional intelligence of women entrepreneurs has good internal validity as the Cronbach's alpha value for the emotional competence inventory comprising of four constructs with seventy three items is 0.913, which is greater than the acceptable value of 0.70. Further, the Cronbach's alpha value for personal factors comprising of two constructs namely, self-awareness and self-management is 0.800, which is above the acceptable limit of 0.70.

Furthermore, the Cronbach's alpha value for social factors comprising of two constructs namely social awareness and social skills or relationship management is 0.871, which is also above the acceptable limit of 0.70. Hence, this tool has good internal reliability with acceptable level of Cronbach's alpha value.

Reliability analysis: Work Engagement

Work engagement was measured using the standardized instrument named Utrecht Work engagement scale, which comprised of four items on a seven point scale. The instrument demonstrates good reliability with a Cronbach alpha of 0.902 in this study, as noted from the table 3.3 below.

Table 3.3 Reliability analysis- Work Engagement-Cronbach's alpha value

S.No.	Categories	Cronbach's Alpha	Number of Items
1	Dedication	0.739	5
2	Absorption	0.765	6
3	Vigor	0.755	6
4	Work Engagement	0.902	17

Reliability analysis- Subjective well-being

Subjective well-being was measured using four standard statements to reveal the satisfaction and happiness in the work of the women entrepreneurs. The Cronbach's value for the subjective well-being was found to be 0.770.

Table 3.4 Reliability analysis - Subjective Well-being - Cronbach's alpha value

S.No.	Category	Cronbach's Alpha	Number of Items
1	Overall subjective well-being	0.770	4

It is noted from the table 3.4 that the Cronbach's alpha value of 0.770 indicates the instrument to be reliable enough to measure the construct- subjective well-being of women entrepreneurs.

3.4.2 Content Validity

The validity of psychological tests generally refers to the degree to which a measure or questionnaire actually measures what it's supposed to measure. It is concerned with how well the concept is defined by the measures. Validity is measured through content validity, construct validity and criterion validity.

Content validity addresses whether a test adequately samples the relevant material it purports to cover. It indicates that the measurement items of an instrument should cover the major content of a construct (Churchill, 1979). It is the degree to which the instrument items represent the concept. This particular study adopted the standardized tool for studying all the three variables. This tool selection was typically done qualitatively after reviewing the literature of the earlier studies on the concept and having enough discussion with a team of academic experts within a field like the research guide and a subject expert specialized in Psychology.

3.4.3 Construct validity refers to the degree to which a test or questionnaire is a measure of the characteristic of interest. This simply refers to whether the test correlates with other measures that ought to be conceptually related while correlating less with those that it should not be associated. Construct analysis is the degree to which a measure confirms a hypothesis created from a theory based upon the concepts under study. Construct validity is ensured through confirmatory factor analysis using AMOS. It is used to estimate the relationship between the exogenous and endogenous constructs in the study model. It ensures that the items inside each construct measures the respective construct.

In this study, emotional intelligence acts as the independent variable and the dependent variable are work engagement and subjective well-being. The components of emotional intelligence are self-awareness, self-management, social awareness and social skills. The construct, self-awareness includes items based on accurate self-assessment, emotional self-awareness and self-confidence. Table 3.5 indicates the construct validity of self-awareness which has items denoted by SA1, SA2 and SA3. The path validity of each item towards the construct is indicated by Critical Ratio (CR), which has to be more than 1.96 to be significant. All the items show the CR values to be above 1.96 and therefore the validity of the path of each item is ensured. The P value is significant for all items in self-awareness, which indicates that each item is contributing to explain its construct.

Table 3.5 Critical Ratios and P value- Self-awareness

Items	Critical Ratio (CR)	P value
SA1		
SA2	2.321	***
SA3	2.320	***

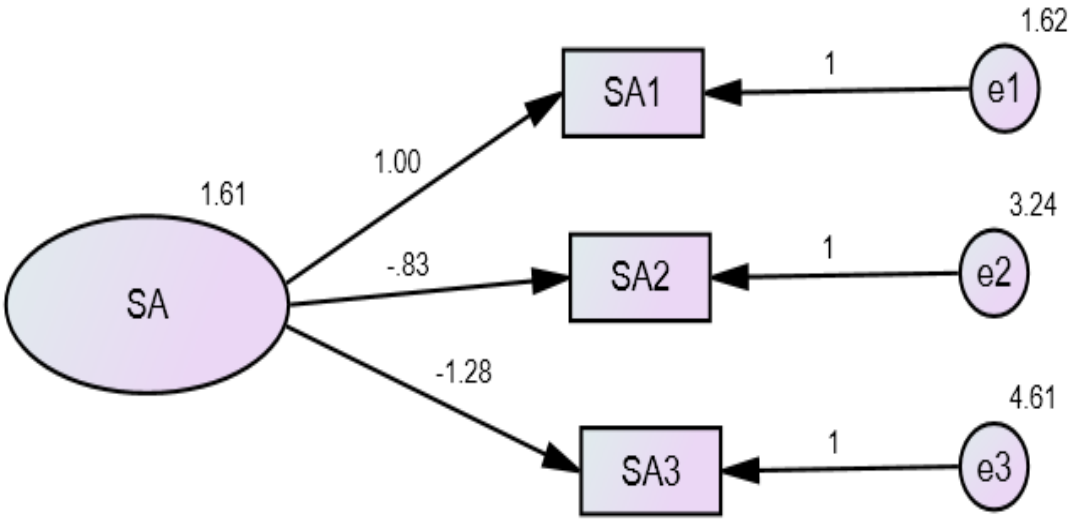

Figure 3.1 Construct validity for Self-awareness construct of Emotional intelligence

The second construct, Self-management includes six items like emotional self-control, trustworthiness, adaptability, achievement orientation, initiative and optimism represented by SM1, SM2, SM3, SM4, SM5 and SM6. The Critical ratio and the P value are given in the table 3.6. The validity of the path of each item towards the construct is indicated by the critical ratio. The Critical ratio for each item is greater than 1.96 stating that all these items explain the self-management construct. The P value is significant for all items in self-management construct, indicating that each item contributes to explain its construct.

Table 3.6 Critical Ratio and P value for Self-Management construct

Items	Critical Ratio (CR)	P value
SM1		
SM2	3.087	***
SM3	2.910	***
SM4	3.027	***
SM5	2.388	***
SM6	2.926	***

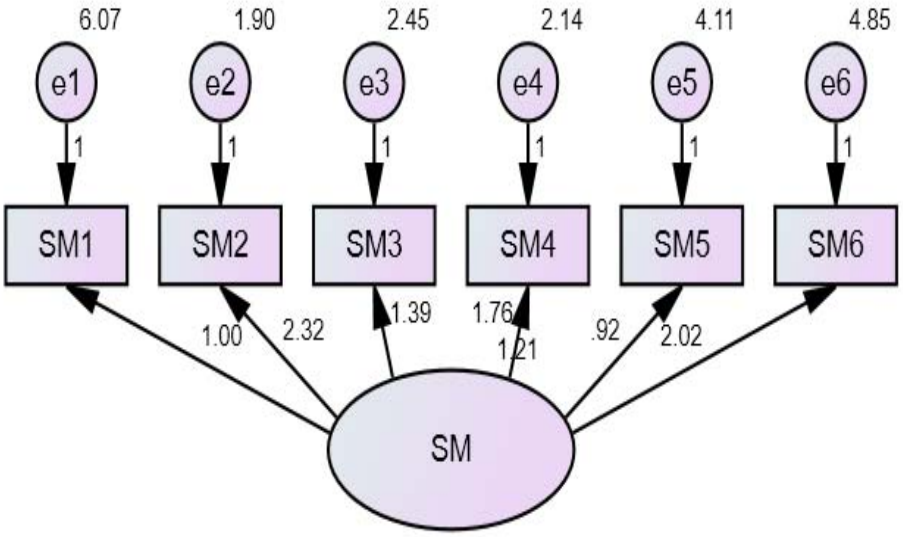

Figure 3.2 Construct validity for Self-Management construct of Emotional intelligence

The third construct of emotional intelligence namely, Social-awareness includes empathy, organizational awareness and service orientation, which is indicated by three items namely SOA1, SOA2 and SOA3.

The table 3.7 indicates the critical ratio values and P value of all items.

Table 3.7 Critical ratio and P value for Social awareness construct

Items	Critical Ratio (CR)	P value
SOA1		
SOA2	3.837	***
SOA3	3.887	***

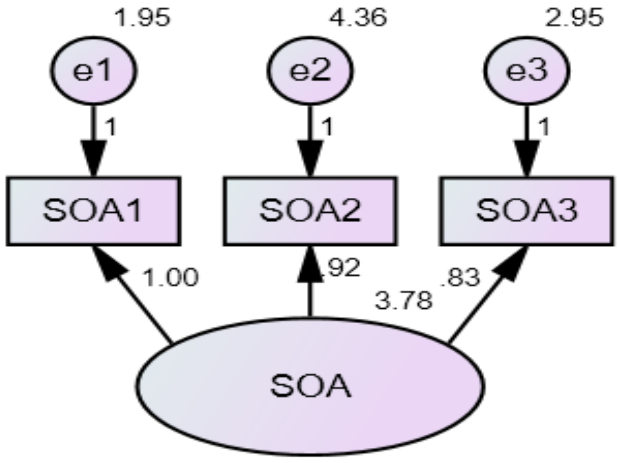

Figure 3.3 Construct validity for Social awareness of Emotional intelligence

The fourth construct of emotional intelligence namely, Social skills or Relationship Management is given by six items like SOS1, SOS2, SOS3, SOS4, SOS5 and SOS6, representing inspirational leadership, influence, change catalyst, conflict management, team work & collaboration and developing others.

Table 3.8 indicates Critical ratio values and the P value of all items. The validity of path of each item towards the construct is indicated by Critical Ratio (CR). However, the Critical ratio for each item is greater than 1.96, stating that all these six items explain the social skills construct. Also, P value is found to be significant for all constructs indicating that each item in the construct is contributing to explain the emotional intelligence concept.

Table 3.8 Critical Ratios and P value for Social skills construct

Items	Critical Ratio (CR)	P value
SOS1		
SOS2	3.087	***
SOS3	2.910	***
SOS4	3.027	***
SOS5	2.388	***
SOS6	2.926	***

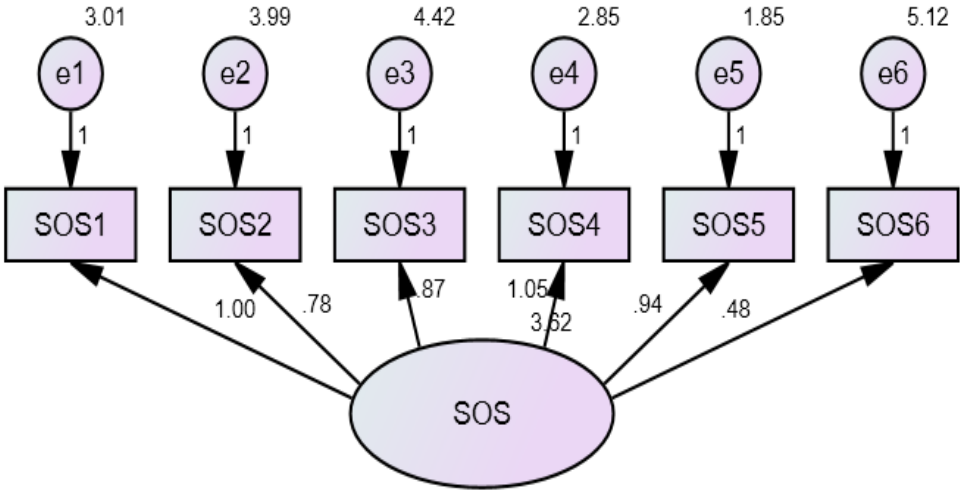

Figure 3.4 Construct validity for Social skills of Emotional intelligence

Emotional intelligence consists of four constructs namely self-awareness (SAM), self-management (SMM), social awareness (SOAM) and social skills (SOSM) and their critical ratios and P value are depicted in the table 3.9. It is found that the critical ratios of each construct is above the threshold value of 1.96, depicting that the items in these constructs are explaining the emotional intelligence concept. Also, P value is found to be significant for all constructs indicating that each item in the construct is contributing to explain the emotional intelligence concept.

Table 3.9 Critical Ratios and P value- Emotional intelligence concept

Items	Critical Ratio (CR)	P value
SAM		
SMM	5.118	***
SOAM	4.828	***
SOSM	5.016	***

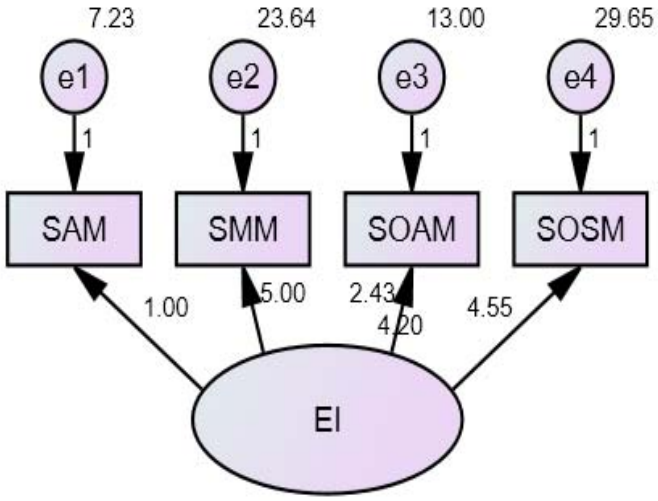

Figure 3.5 Construct validity for Emotional intelligence

The other construct in the study is the work engagement, represented by three items, WE1, WE2 and WE3. Table 3.10 indicates the critical ratio and P value of all items in the construct. It is found that the critical ratio of all items is above the threshold value of 1.96, pointing out that all these three items namely dedication, vigour and absorption explain the work engagement construct. The P value is also found to be significant for all the items in this construct, which indicates that each item is contributing to explain the construct.

Table 3.10 Construct validity for Work Engagement

Items	Critical Ratio (CR)	P value
WE1		
WE2	7.986	***
WE3	7.957	***

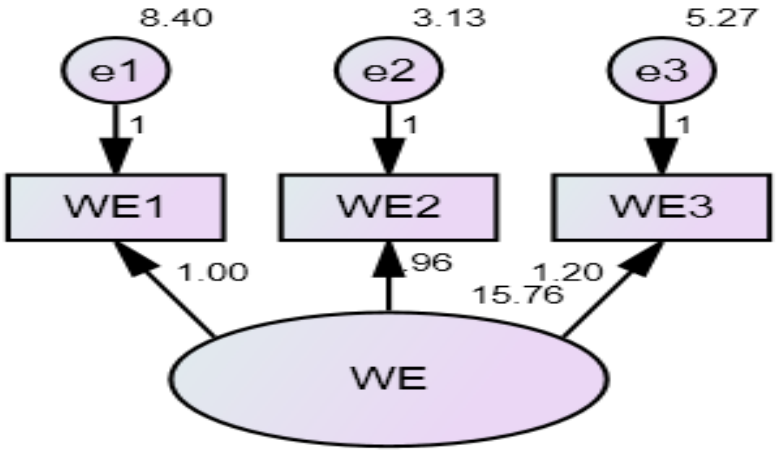

Figure 3.6 Construct validity for Work Engagement

The sixth construct in the study is the subjective well-being, represented by the items SWB1, SWB2, SWB3 and SWB4. Table 3.11 represents the critical ratio and P value of all items in the subjective well-being construct. It is found that the critical ratio of each item is above the threshold level of 1.96, indicating that all these items explain the subjective well-being well. Also, the P value is also found to be significant for all items in this construct, which indicates that each item is contributing to explain its construct.

Table 3.11 Construct validity for Subjective well-being

Items	Critical Ratio (CR)	P value
SWB1		
SWB2	3.391	***
SWB3	3.811	***
SWB4	3.904	***

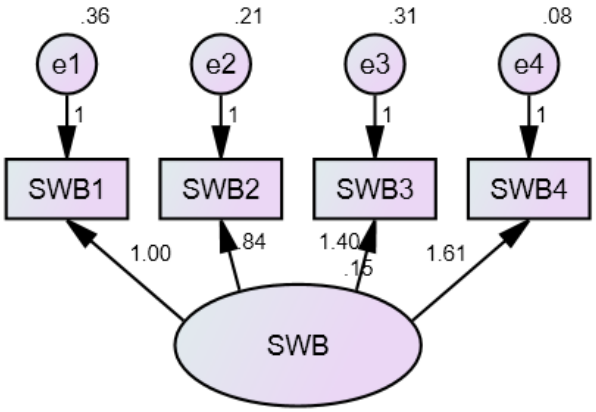

Figure 3.7 Construct validity for Subjective Well-being

3.4.4 Criterion validity

Criterion Validity is the degree to which the test or measure correlates with some outcome criteria. It is concerned with detecting the presence or absence of one or more criterion considered to represent constructs of interest. Criterion validity for work engagement was tested by examining the R^2 value obtained for the construct, whose value depicts the extent of representation by the independent variable namely, emotional intelligence. Co-efficient of determination (R^2) is the percentage of the total variation in the dependent variable explained by the independent variable. It ensures the criterion validity of work engagement as the emotional intelligence serve as a predictor variable for it.

Table 3.12 Impact of Emotional Intelligence on Work Engagement

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.696[a]	0.485	0.476	0.56584
a. Predictors: (Constant), emotional intelligence				

Therefore, from the table 3.12, the R square value of work engagement i.e. 0.485 indicates that 48.5% of the variation of work engagement is explained by the constructs which are shown in linear relationship with it. Proportions of variance from 20 - 25% are considered substantial (Heiman 1998). Thus, the instrument used to measure emotional intelligence and work engagement demonstrated high criterion validity.

Table 3.13 Impact of Emotional Intelligence on Subjective Well-being

Model 1	R	R square	Adjusted R square	S.E. of estimate
1	0.481[a]	0.231	0.225	0.92599

a. Predictors: (Constant), emotional intelligence

* indicates significance at 0.05 level

It could be observed from the table 3.13, that the R square value of 0.231 indicates that around 23% of the independent variable (emotional intelligence) have impact in the subjective well-being of women entrepreneurs. Therefore, the R-square value of subjective well-being 0.231 describes that 23% of the variation in subjective well-being is explained by the construct-emotional intelligence, which serve as the predictor variable for it. Proportions of variance from 20-25% are considered substantial (Heiman, 1998). Thus, the instrument used for measuring emotional intelligence and subjective well-being demonstrated high criterion validity.

3.5 Sampling and Data collection

The population of the study consists of women entrepreneurs registered in District Industries Centre at Coimbatore. The researcher relied upon the list of women entrepreneurs available from District Industries Centre to collect the data for the study. Sampling frame consists of approximately 2500 women entrepreneurs in the frame of District Industries Centre during the study period. Sampling unit is the individual women entrepreneur identified from the sampling frame of District Industries Centre, Coimbatore during the study period. The sampling technique adopted in this study is simple random sampling. The women entrepreneurs were randomly selected from the sampling frame and were administered with the questionnaires. Of the total, questionnaires were distributed to 625 entrepreneurs, 546 women entrepreneurs responded completely during the study period. Hence, the response rate was 87 per cent from the respondents of the study.

3.6 Data Analysis

Collected data was subjected to analysis through SPSS package in accordance with the objectives of the study. All the statistical tests were conducted at 5% level of significance. The statistical tools employed for analysis are

1. Percentage analysis

2. Mean and Standard deviation

3. Analysis of Variance (ANOVA)

4. Regression

5. Correlation

6. Chi-square analysis

7. Discriminant analysis

8. Structural equation modelling through AMOS

The mean scores were employed to present the general profile of the women entrepreneurs identified for the study. The profile gave the highest and lowest mean score for all the demographic and business related factors of the women entrepreneurs. Standard deviation was observed to see the variation in demographic and business related factors among the women entrepreneurs. ANOVA was used to identify the mean difference among the respondents towards the study variables based on the demographic and business related factors. Post Hoc tests were performed wherever necessary to identify the groups which were statistically different in the study. The data was analyzed to study the association of emotional intelligence with work engagement and subjective well-being of women entrepreneurs using correlation, regression, discriminant analysis and structural equation modelling.

3.6.1 Profiling the Demographic characteristics of the women entrepreneurs

Percentage analysis was used to profile the women entrepreneurs based on their demographic and business related factors such as age, education, locality of their residence, nature of residence, marital status, type of family, number of family members, number of earning members, number of children, annual family income, occupation of the spouse, leisure time, activity involved in during leisure time, total time spent for business activity, nature of business, industry involved in, years of experience in business, years of work experience, type of business organization, source of funds, motivational factor to start business, size of business enterprise and involvement of the business firm in social activities.

3.6.2 Motivational and Support factors for Women Entrepreneurs

Percentage analysis was used to study the motivational factors that encouraged women entrepreneurs to initiate their business. Motivational factors like previous work experience, passion, successful role-model, support from family members and favourable government policy were considered for the study. Identification of those factors that motivates the women entrepreneur can help the policy makers to take measures in creating the favourable ecosystem for them to manage their business.

Friedman's rank correlation test was applied to study the level of support from spouse, children, friends, relatives, Government and Society. This statistical tool can help to analyse various factors and assign them ranks in descending order. The factor that had the first rank means that it has received the highest support from women entrepreneurs in managing their business. The factor that had the last rank was considered to have the least support for women entrepreneurs to perform in their business. Hence, the least support factors can be identified and steps can be taken to strengthen the support from those factors for the women entrepreneurs to manage their business.

3.6.3 Barriers for Women Entrepreneurs

Friedman's rank correlation was employed to examine the barriers for the women entrepreneurs in their business performance. Lack of support from family and friends, lack of technical education, non-availability of collateral property for securing loans, difficulty in managing work-family life balance, lack of managerial and marketing skills, poor networking skills, low risk bearing ability, low level of mobility and lack of role models, mentors and peer support were identified as common barriers for women entrepreneurs. The factor that ranked first was considered to be the major barrier or challenge for the women entrepreneurs. This factor served as the biggest hurdle for them to lead their business. The subsequent ranks were analysed and the factor that served as last rank can prove to be the least barrier for them. This analysis can help to identify the major barriers or problems or hurdles or challenges for the women entrepreneur, which then can be used to take measures to overcome them.

3.6.4 Existing level of Emotional Intelligence components, Work Engagement components and Subjective Well-being of women entrepreneurs- Descriptive Statistics

Mean and standard deviation helps to study the existing level of emotional intelligence and its components; work engagement and its components along with subjective well-being. It helps to compare the highest and lowest mean and standard deviation across different levels. This analysis gives the overall perception of the respondents towards the components of emotional intelligence, components of work engagement and subjective well-being. In the research study, emotional intelligence was measured using seventy three statements on a five point scale from one to five, using Emotional Competence Inventory-360, version 2.0 developed by Daniel Goleman and Richard Boyatzis. Work engagement was measured using Utrecht work engagement scale with the support of seventeen questions on a seven point scale. Subjective well-being was measured using four statements to study the happiness and achievement of women entrepreneurs using a six point scale.

3.6.5 Association between Demographic and Business related factors of Women Entrepreneurs – Chi-square analysis

Chi-square analysis was employed to test the association between three sets of factors like age of the respondents and time spent in business activity, motivational factor to start a business and type of business and the size of the business and the involvement of the firm in social activities. Null hypothesis and alternate hypothesis was formulated to test the association between the two variables. When p value is less than 0.05, alternate hypothesis is accepted and there exists significant association between the two variables. If p value is greater than 0.05, null hypothesis is accepted, which means that there is no significant association between the two variables.

3.6.6 Influence of Personal factors on the Emotional Intelligence, Work Engagement and Subjective Well-being of Women Entrepreneurs – Analysis of Variance (ANOVA)

Analysis of Variance (ANOVA) was applied to test if the means between two groups are statistically different. ANOVA is a univariate statistical technique to

determine if, on the basis of one dependent measure, whether samples are from populations with equal means (Hair *et al*., 2003). It compares a dependent variable across two or more groups. After identifying the overall difference among means of more than two groups, post hoc tests were conducted at 0.05 significance level to further investigate these differences. Tukey-B reveals the exact mean differences among various groups. Two means are considered to be significantly different if the absolute difference in their corresponding sample means is greater than a specific threshold value, indicated by p value (Elliot *et al.,* 2007).

3.6.7 Association of Emotional Intelligence with Work Engagement and Subjective Well-being of Women entrepreneurs – Correlation and Regression

Linear relationship between variables was measured for significance using Pearson correlation. Correlation between the variables was analyzed to test if the relationship among the characteristics were significant. The concept of association represented by the correlation coefficient (r) describes the relationship between two variables. Two variables are said to be correlated if changes in one variable are associated with changes in the other variable. The correlation coefficient indicates the strength of the association between any two metric variables. The value can range from -1 to +1, with +1 indicating a perfect positive relationship, 0 indicating no relationship and -1 indicating a perfect negative or reverse relationship.

Linear regression analysis was used to analyze the relationship between a single dependent variable and independent variables. The objective of regression analysis is to use the independent variables whose values are known to predict the single dependent value selected. Each independent variable is weighted by the regression analysis procedure to ensure maximal prediction from the set of independent variables. The set of weighted independent variables forms the regression variate, which is a linear combination of the independent variables that best predicts the dependent variable (Hair *et al.,* 2003).

The co-efficient of determination (R^2) is the measure of the proportion of the variance of the dependent variable about its mean that is explained by the independent variables. The coefficient can vary between 0 and 1. Higher the value of R^2, greater the

explanatory power of the regression equation and therefore, better the prediction of the dependent variable (Hair *et al.,* 2003). When the value of R^2 is greater than 25%, the proportion of variance are considered substantial (Heiman, 1998).

Beta co-efficient are standardized regression co-efficient that allows for a direct comparison between co-efficient as to their relative explanatory power of the dependent variable (Hair *et al.,* 2003). The unstandardized coefficients were used to derive the regression equation or the regression variate to estimate the dependent variable.

3.6.8 Discriminating higher and lower forms of Work Engagement and Subjective Well-being based on Emotional Intelligence – Discriminant analysis

Discriminant analysis involves deriving a variate, the linear combination of the two or more independent variables that will discriminate the best between a priori defined groups. The linear combination for a discriminant analysis, called discriminant function is a variate of the independent variable selected for their discriminatory power used in the prediction of group membership. The predicted value of the discriminant function is the discrimination Z score, which is calculated for each respondent.

The discriminant loadings which is the measurement of the simple linear correlation between each independent variable was calculated. The loadings and the Z score are calculated whether or not an independent variable is included in the discriminant function. The discriminant loadings are otherwise called as structure correlation and are presented in the SPSS output as structure matrix.

The correlation values when greater than 0.3 will substantially discriminate the groups (Hair *et al*., 2003). The value was also used to measure the predictive power of the variables expressed as their rank of predictive power. The Hit ratio (percentage correctly classified), is analogous to regression (R^2), that reveals how well the discriminant function classified the objects.

3.6.9 Exploring the Impact of Emotional Intelligence on Work Engagement and Subjective Well-being of Women Entrepreneurs- Structural Equation Modelling

A model is a specified set of dependence relationships that can be tested empirically. The purpose of a model is to concisely provide a comprehensive

representation of the relationships to be examined. Structural Equation Modeling (SEM) is “a collection of statistical techniques that allow a set of relationships between one or more independent variables, either continuous or discrete, and one or more dependent variables, either continuous or discrete, to be examined” (Tabachnick *et al.*, 2001, p.653). SEM has become an important tool for analysis that is widely used in academic research (Heise, 1975; Bentler, 1980; Anderson *et al.*, 1988; Bollen, 1989; Breckler 1990; Anderson *et al*., 1991; Byrne, 2001; Hair *et al.,* 1995; Jöreskog *et al.,* 1996; Schumacker *et al.*, 1996; Kline, 2005; Homles-Smith *et al.*, 2006)

The primary purpose of SEM is to explain the pattern of a series of interrelated dependence relationships simultaneously between a set of latent or unobserved constructs, each measured by one or more observed variable (Hair *et al*., 1995; Schumacker *et al.*, 1996). SEM is based on the assumption of causal relationships where a change in one variable (x1) is supposed to result in a change in another variable (y1), in which y1 affects x1. Not only does SEM aim to analyze latent constructs, in particular the analysis of causal links between latent constructs, but also it is efficient for other types of analyses including estimating variance and covariance, test hypotheses, conventional linear regression, and confirmatory factor analysis (Jöreskog *et al.*, 1996).

According to Anderson *et al.,* (1988), SEM is a confirmatory method providing “a comprehensive means for assessing and modifying theoretical models”. Therefore, researchers in social science research have found SEM to be an appropriate technique to examine their hypothesized models (Crosby *et al*., 1990; Smith, 1998; De Wulf *et al.,* 2001; Luarn *et al.*, 2003; Roberts *et al*., 2003; Palmatier *et al*., 2006; Lin *et al*., 2006).

SEM also has the ability to assess the unidimensionality, and reliability and validity of each individual construct (Anderson *et al.*, 1988; Bollen, 1989; Hair *et al.*, 1995; Kline, 1998, Kline, 2005). Further, it provides an overall test of model fit and individual parameter estimate tests simultaneously, thus, providing the best model fits to the data adequately. In this study, SEM using confirmatory factor analysis, and therefore, it has been conducted.

Arbuckle's (2005) structural equation modeling software AMOS 20 (Analysis of Moment Structures) was used to explore statistical relationships among the items of each

factor and between the factors of independent and dependent variables. Further, the researcher can specify, estimate, assess, and present the model in a causal path diagram to show hypothesized relationships among variables. The empirical model can be tested against the hypothesized model for goodness of fit. Any causal paths that do not fit with the original model can be modified or removed.

Structural equation modeling (SEM) is used to test the hypotheses arising from the theoretical model. In order to perform the SEM analysis, the two-stage approach recommended by Anderson *et al.,* (1988) was adopted.

In the first stage (measurement model), the analysis was conducted by specifying the causal relationships between the observed variables (items) and the underlying theoretical constructs. For this purpose, confirmatory factor analysis using AMOS 20 was performed. Following this, the paths or causal relationships between the underlying exogenous and endogenous constructs were specified in the structural model (second stage).

In stage two, we go for testing the hypothesis. Once all constructs in the measurement model (stage one) were validated and satisfactory fit achieved (Anderson *et al.,* 1988; Hair *et al.,* 1995; Kline, 2005; Homles-Smith *et al.,* 2006), a structural model can then be tested and presented as a second and main stage of the analysis. The structural model has been defined as "the portion of the model that specifies how the latent variables are related to each other" (Arbuckle, 2005). The structural model aims to specify which latent constructs directly or indirectly influence the values of other latent constructs in the model (Byrne, 1989).

Hence, the purpose of the structural model in this thesis is to test the underlying hypotheses. The hypotheses were represented in causal paths to determine the relationships between the constructs under consideration. In the proposed theoretical model, the underlying constructs were classified into two classes, including exogenous constructs and endogenous constructs.

To evaluate the structural model, goodness-of-fit indices are examined to assess if the hypothesized structural model fits the data. If it did not fit, the requirement was to respecify the model until one was achieved that exhibited both acceptable statistical fit

and indicated a theoretically meaningful representation of the observed data (Anderson *et al.*, 1988; Hair *et al*., 1995, Tabachnick *et al*., 2001; Kline, 2005).

Because the assumptions underlying structural equation modeling were met, the coefficient parameter estimates were examined along with the overall model fit indices to test hypotheses. Parameter estimates are fundamental to SEM analysis because they are used to generate the estimated population covariance matrix for the model (Tabachnick *et al*., 2001). Coefficients' values are obtained by dividing the variance estimate by its Standard Error (S.E). That is, when the Critical Ratio (C.R.) (called t-value in Tables) is greater than 1.96 for a regression weight (or standardized estimates), the parameter is statistically significant at the .05 levels.

In the path diagram, the values for the paths connecting constructs with a single-headed arrow represent standardized regression beta weights. As in the measurement model, the values appearing on the edge of the boxes are variance estimates in which the amount of variance in the observed variables is explained by latent variables or factors, and values next to the double headed arrows show correlations. The evaluation of the structural model of this thesis is discussed below.

Endogenous construct have at least one single- headed arrow leading to them. Straight arrows (or single arrow) indicate causal relationships or paths, whilst the absence of arrows linking constructs implies that no causal relationship. Terms (e) represent random error due to measurement of the constructs they indicate. The parameter (z) represents the residual errors in the structural model resulting from random error and/or systematic influences, which has explicitly modeled. If the probability value and the key modification indices match the pre-determined standards, the model is said to be statistically fit.