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A STUDY TO DEVELOP SCALE FOR DETERMINING THE SOCIAL INNOVATION PERSPECTIVES OF ENTREPRENEURS[1]

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Abstract

The aim of this study is to develop a scale for determining the social innovation perceptions of entrepreneurs. In the development stage of the scale, 62 items were obtained from a review of the social innovation literature. The 62-item draft scale was applied to 62 travel agency managers operating in Antalya. According to the skewness and kurtosis values of the obtained data, it was determined that the data were normally distributed. Results from the KMO and Bartlett's Test of Sphericity showed that the sample size was compatible with the factor analysis and that the data were derived from a normal distribution. A factor analysis, which included varimax rotation, was performed to determine the structural validity of the scale. From the results of the factor analysis, a 31-itemed scale with 4 dimensions that explained 68.729% of the total variance was obtained. For reliability, the Cronbach Alpha coefficients were calculated for all four dimensions and for the scale as a whole after performing the varimax rotation (0.94). The item-total correlations calculated by Pearson's analysis were significant ($p < 0.001$). The top-to-bottom 27% analysis with t-test showed that the items and factors were distinctive. The developed scale was then applied to a large sample group and a structural equality model was established. The results obtained confirm that the developed scale is valid and reliable.

1. INTRODUCTION

Although innovations are often perceived in technological terms, they are in reality much more diverse and can include medical, preventive care, radical, managerial, business and social breakthroughs, to name several (Tuomi, 2012). Contrary to technological

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innovations, which are aimed at promoting scientific knowledge of the type that is not necessarily intended to be applied to realistic problems (Rogers, 2003), social innovations seek to solve problems and improve existing practices (Schienstock and Hamalainen, 2001; Pol and Ville, 2009). The concept of social innovation is a relatively new concept. As such, it involves different meanings and there is little to no consensus on its specific definition (Tuomi, 2012). Pol and Ville (2009) pointed out that while social innovation is a concept that seems to be appealing to everyone, not many are sure of its meaning.

Social innovation can be found under various disciplines in the literature. Choi and Majumdar (2015) have identified seven bodies of literature that involve different perspectives on the concept of social innovation, including a sociological perspective, a creativity research perspective, a community psychology perspective, an entrepreneurship perspective, a welfare economics perspective, a practice perspective, and a regional development perspective. Many of the reports and articles on social innovation have been concerned with their practical applications as opposed to the theoretical understanding of the subject. Such reports and articles are based on the development of road maps and strategies to facilitate social innovation from the theoretical context of social innovation (Choi and Majumdar, 2015).

As a result, the importance of social innovation is highlighted in the literature as a reconciliation of various subjects, such as regional development, reintegration of excluded groups, reduction of unemployment, application of better environmental policies, expansion of welfare at the local level, and social change. There are, however, no studies within the literature that measure social innovation from the viewpoint of entrepreneurship. To determine the social innovation perceptions of entrepreneurs, a social innovation scale is needed. Given that the literature on social innovation includes no such scale, this study has aimed to develop a scale to measure the social innovation practices and creations of entrepreneurs in certain regions. The results from this study shall serve to contribute to the body of information on this subject and be a model for future studies on social innovation.

2. SOCIAL INNOVATION

Max Weber was the first person to describe the concept of social innovation, or social invention, as he referred to it, in the late nineteenth century. In the interest of economic efficiency, Joseph Schumpeter proclaimed in the 1930s that technological innovations were integral to social innovation.

Mulgan et al. (2007) described social innovation as innovation activities and services that are primarily developed and disseminated by societal-oriented organizations to meet

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social needs. This description serves to distinguish social innovation from business innovation. Westley and Antadze (2010) define social innovation as the application of new products, processes or programs that deeply change the beliefs, resources, basic routines, authority, or governing capacity of the social system wherein the innovation is being implemented. Murray et al. (2009), on the other hand, described social innovations as new ideas (products, services and models) that form new social relations and/or cooperation and that simultaneously meet social needs as social innovations. Howaldt and Schwarz (2010) argued that social innovation is a new mix of social practices, deliberately directed by individual actors or actor clusters, which serve to meet the needs and to find solutions to problems in specific regions. Lastly, Neumeier (2012) defines social change as a change in behavior, attitudes and perceptions of a group of people who are involved in a group of interests and who have joined a benefit-based network that leads to a new and improved collaborative action within or outside the group.

According to Groot and Dankbaar (2014), social innovation is often the result of a private initiative. This initiative may also come from people working in the public sector, but new social arrangements initiated by politicians are not typically viewed as social innovations. People who come up with social innovations develop ideas to meet some unsatisfied need(s) (Groot and Dankbaar, 2014). In accordance with Schumpeter (1934), who argues that innovation is the essence of entrepreneurship, it can be said that social innovation is related to "social entrepreneurship".

The social innovation literature shows that entrepreneurs have introduced social innovation applications related to the environment, workplace / staff, and society. Social innovations addressing environmental problems in particular have gained popularity over the years. The many environmental issues impacting today’s world, such as lack of fresh water resources, transportation and pollution problems, diminishing biodiversity, ecosystem deterioration, and floods, have inspired a profusion of environmental social innovations, including those related to forest recycling facilities, organic farming practices, the development of greenhouses, the establishment of farmers' markets (Seyfang and Smith, 2007), vehicle sharing practices, such as the ride-sharing community BlaBlaCar, and recyclable energy use. In the current literature, terms like eco-innovation and eco-technology are used interchangeably with environmental innovation (Oltra, 2008). The concept of environmental innovation is a general and widely-used concept in innovation, especially in the social innovation literature.

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Workplace / personnel innovation refers to strategically accepted and applied changes in the distribution of human and nonhuman resources and in the organization and management of organizational practices which enable the improvement of the quality of work life and organizational performance (Prevent et al., 2012). In other words, social innovation functions as a strategy applied by organizations to foster the talents and competencies of the personnel (Dhondt et al., 2012). In the context of social innovation and social change, it can be said that the most important workplace / personnel innovation is gender equality. Gender equality in the workplace means that women and men have the same opportunities, including opportunities for success in the workplace, and that there are no restrictions regarding gender roles. One of the most substantial problems that a workplace faces is temporary employment. The rise in temporary employment not only results in the decrease of salary raises, but also leads to an increased number of personnel and families being unable to benefit from full-time permanent employment opportunities. According to Kalleberg (2011), a growing number of personnel work under short-term agreements and a basic salary and cannot benefit from retirement plans or additional benefits. Another workplace / personnel innovation in the context of social innovation is related to disabled individuals. Although work places may offer physical employment to disabled people, this does not necessarily guarantee that these workplaces provide a suitable environment for disabled individuals. Without additional support, disabled people will be less successful at work because they cannot fulfill their job responsibilities (OECD, 2005).

The main objective of community innovation is to ensure that individuals, groups and communities in a socially and economically unfavorable position have access to better opportunities and the right to free speech. One of the most important roles of community innovation is to strengthen and organize local people for the purpose of cultivating positive social change. Community innovation facilitates the development of socially based economic projects that enhance and diversify local economies. Another issue related to community innovation is natural and social capital. Natural capital includes assets related to weather, geographical isolation, natural resources and sites of natural beauty (Emery and Flora, 2006). Social capital, on the other hand, refers to social cohesion, which can have either a positive or a negative impact on the interactions between individuals and organizations.

Social innovation must be examined under the socio-economic dimension. Socio-economics, which is an umbrella term with different uses, refers to the function of the economy as a whole in the study of society (Eatwell et al., 1989). In this context, it can be said that social innovation, which seeks solutions to economic development, unemployment,

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and environmental and social problems, is closely related to socio-economy. For example, the OECD (2012) reported that social innovations introduced to reduce climate change are accelerating and that in recent years, manufacturing companies have increasingly directed their efforts towards sustainable manufacturing.

According to Varım (2001), the development of technology and the establishment of innovations not only affect the economic field, but also the social, political and cultural fields. In this sense, innovation is also important for socio-economic development strategy and economic policy. The production methods of business activities have improved with innovations, and innovation has been a factor driving socio-economic development. Social innovations, on the other hand, affect economic development, including economic growth, employment and income per capita, accelerates modernization, and transforms the socio-cultural structure (Varım, 2011).

Implementation social innovations, such as the donation of services, products or equipment, the provision of support for community health, financing education, and projects that create new jobs for the local community and the implementation of programs by entrepreneurs that aim at local development, can improve the welfare of a community.

3. METHODOLOGY

In the study, validity and reliability analyses were conducted to develop a Likert-type scale designed with Likert type model (Likert, 1932) to measure the social innovations of entrepreneurs. The development stage of the scale, the steps for which are given in Fig. 1, started with a review of the previous research (Şeker et al., 2004). Next, the developed scale was applied to a large sample group (397 tourism enterprises operating in Antalya), followed by the establishment of a structural equality model.

The pilot scale, prepared as a five-point Likert-type scale (Likert, 1932) (1: strongly disagree - 5: strongly agree) was administered to a total of 62 travel agency managers between April and June 2016.

To test the validity of the scale, the data were subjected to various analyses, including a factor analysis, which aims to obtain a significant number of identifiable determinants that can be explained as part of a large number of variables (Büyüköztürk, 2002). Factor analysis is also referred to as construct validity analysis (Köymen, 1994). Results from the KMO and Bartlett Test were used to interpret the factor analysis. According to Tavşancıl (2010), in factor analysis the Kaiser-Meyer-Olkin (KMO) test should be performed to determine the adequacy of the data obtained from the sample. The value of KMO is considered to be

excellent the nearer it approaches 1, but unacceptable when it is well below 0.50. With factor analysis, the data should be normally distributed in a population. Whether the data come from a multivariate normal distribution or not is tested using Bartlett's test. The chi-square value in the Bartlett's test determined significance to be at the 0.000 level and confirmed that the mean selected sample represented the population.

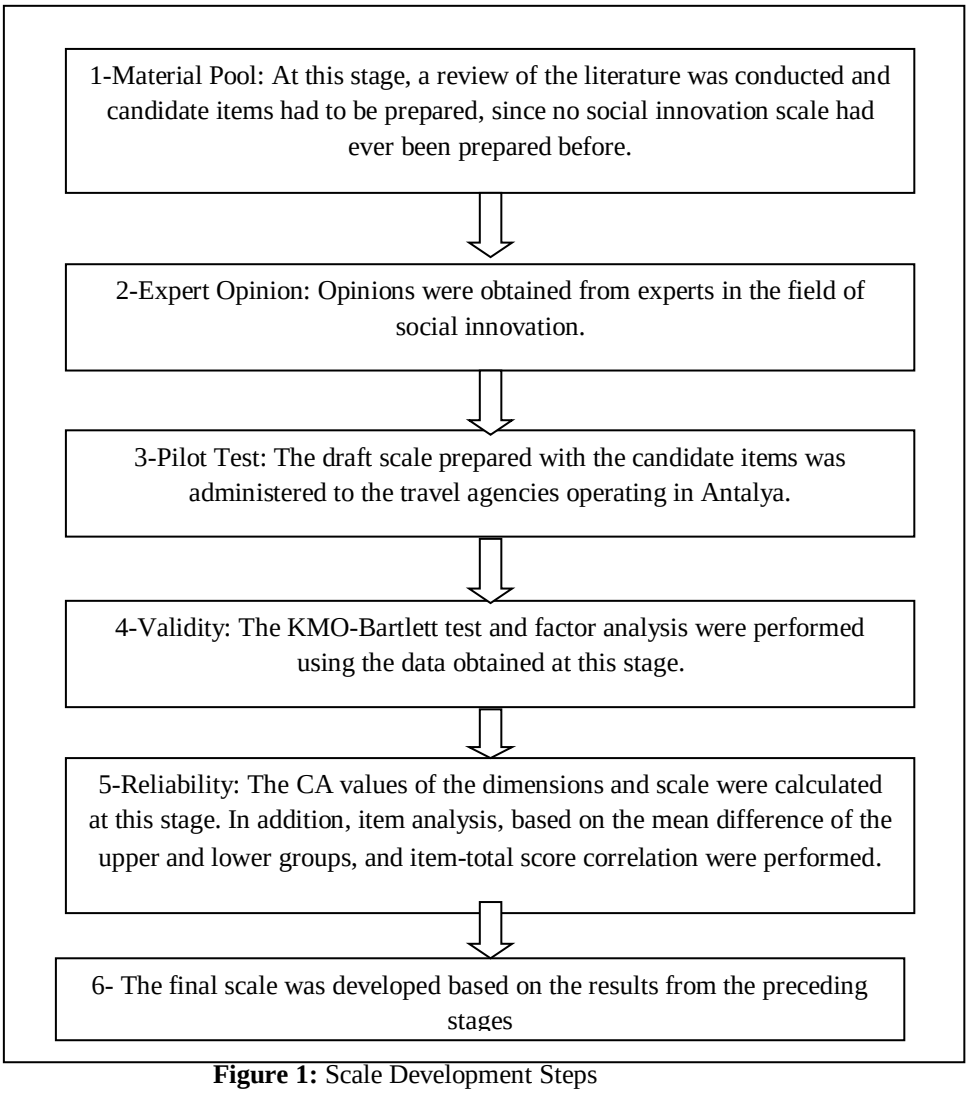

Figure 1: Scale Development Steps

In determining the items constituting the scale, the factor load in the factor analysis must be 0.30 or higher, items must fall under one factor, a factor must consist of at least four items, and the item residual and item total correlation coefficient must be over 0.20.

The data were analyzed to test the validity and reliability of the scale. Reliability concerns how accurately a measurement tool measures an intended target (Tekin, 1993). Cronbach's alpha values were used to measure the reliability of the Likert-type scales. This value also provides information on the internal consistency / homogeneity of the dimensions of the developed scale (Tezbaşaran, 1996). In addition, an item analysis based on the mean

difference of the upper and lower groups was performed along with determination of item-total score correlation. Using the developed scale, data were collected from the large sample group. Tabachnick and Fidell (1996) stated that in the analysis of a structural equation model, the sample size should be at least 10 times the observed number of variables. Therefore, in our study, for the 31 questions, 310 samples were considered sufficient. However, to make the results from the study sample statistically sounder and more reliable for the statistical analysis, data were collected from 397 samples.

4. FINDINGS

The skewness and kurtosis values of all items were examined to determine the suitability of the obtained data for factor analysis. Since the values were between -1.5 and 1.5, the data were confirmed to have normal distribution.

Following the confirmation of the normal distribution of data, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity, both of which were included in the first stage of scale development, were carried, and the results are given in Table 1. The KMO test was used to confirm the suitability of the sample size for factor analysis, while the Bartlett test was applied to show whether the data derived from a multivariate normal distribution or not (Otrar and Argun, 2015).

Table 1: KMO (Kaiser-Meyer-Olkin) and Bartlett's Test of Sphericity

KMO (Kaiser-Meyer-Olkin)	0.754	
Bartlett's Test of Sphericity	Approx. Chi-Square	1895.848
	df	153
	p	0.000*
*p‹0.05		

According to Tavşancıl (2010), the nearer the KMO value is to 1, the more excellent it is, while a KMO value lower than 0.50 is not accepted. When Table 1 is examined, it is seen that the value of KMO is 0.754, which confirms that the sample size in the pilot study was suitable for factor analysis. Bartlett's value was found to be which significant, an indication that the data derive from a multivariate normal distribution. Therefore, the factor analysis, which included varimax rotation, of the 62 items on the scale was used to obtain the dimensions of the scale.

From the first factor analysis, it was determined that 29 items had a factor load of less than 0.40 (Zeller and Karmines, 1978), which is below the community load of 0.30 (Nunnally, 1970), and therefore were removed from analysis. Once these were remover, a total of 4 dimensions were obtained with the factor analysis. The items in the obtained dimensions were

subjected to intra-correlation analysis. Two items with high correlation were removed from the dimensions, and the factor analysis was performed again. Based on the results from the last factor analysis performed with the remaining 31 items, a social innovation scale was created with 4-dimensions which explained 68.729% of the total variance. These dimensions were designated personnel practices, environmental practices, social practices and socio-economic practices. The results are given in Table 2 and summarized below as follows:

- The dimension personnel practices are composed of 8 items, and the variance explanation rate is 62.659%. The load values of the items in this dimension are the acceptable load values for the factor (lowest load value 0.530, highest load value 0.843).
- The dimension environmental practices are composed of 9 items, and the variance explanation rate is 65.852%. The load values of the items in this dimension are the acceptable load values for the factor (lowest load value 0.694, highest load value 0.890).
- The dimension social practices are composed of 7 items, and the variance explanation rate is 60.530%. The load values of the items in this dimension are the acceptable load values for the factor (lowest load value 0.559, highest load value 0.753).
- The dimension socio-economic practices are composed of 7 items, and the variance explanation rate is 69.622%. The load values of the items in this dimension are the acceptable load values for the factor (lowest load value 0.682, highest load value 0.850).

Cronbach Alpha values were calculated to determine the reliability and internal consistency of the obtained dimensions and the results are presented in Table 3. According to the Cronbach alpha values, the dimensions were reliable and had internal consistency.

An item analysis based on the difference between the lower 27% group averages and the upper 27% was performed to understand whether there was variation between the upper and lower groups in the answers given to each item and to determine the discrimination power (Büyüköztürk, 2012). The sum of the items was calculated and sorted from small to large. Of the 62 participants, the 27% constituting the lower and upper ends was calculated as 17. The data on the scale were divided into two groups, namely, the first 17 and last 17, according to items total. A t-test was performed on each item to reveal if there was a significant difference between the two groups, and the results are shown in Table 4.

Decisions on whether each item will be included on the final scale or not are by applying different item analyses to the data obtained from the draft scale (Tezbaşaran, 1997). In this way, the reliability of the scale increases. When the results of item analysis based on the group mean differences of the lower 27% and upper 27% were examined, the independent group t-test for each item resulted in significant statistical differences for the upper and lower groups ($p < 0.01$). The differences found were in favor of the upper 27% groups. The results of item analysis based on group mean differences of the lower 27% and upper 27% support the distinctiveness of the sub dimensions of the scale and the total scores.

Table 2: Results of Factor Analysis

ITEMS	Personnel Practices	Environmental Practices	Social Practices	Socio-economic Practices
We provide paid maternity leave	0.693			
We provide paid leave to personnel to vote in elections	0.774			
We provide employment for under-represented groups (racial minorities, veterans, disabled).	0.721			
We include personnel in the decision-making process	0.807			
We have a salary strategy for income inequity between personnel	0.843			
Employees are provided with job security	0.530			
We use new technologies to meet the social needs of personnel	0.744			
We pay a reasonable wage for all full-time personnel	0.838			
We use clean and/or low emission transportation options		0.739		
We provide financial incentives to employees for efficiency (energy-saving vehicles, etc.)		0.694		
We produce renewable energy in our firm		0.718		
Precautions are taken for climate change		0.771		
R&D activities for the environment are being carried out		0.788		
Pollution control technologies are used		0.875		
Waste management is implemented		0.798		
Cleaning technologies are used		0.775		
Environment diagnosis and monitoring technologies are used		0.890		
We produce a product or service aimed at the benefit of the community.			0.712	
We support local suppliers			0.726	
We support projects that aim to improve local community health			0.639	
We offer assistance for local community security			0.674	
We develop products /services that will create social change in society			0.753	
We are putting new ideas into practice to create social value for society			0.696	
We support projects that aim to create new public areas			0.559	
We donate services, products, supplies or equipment to society				0.682
We support programs for individual and / or community health				0.793
We donate to primary and high school education				0.850
We donate to higher education				0.754
We support economic equality in the society				0.787
We support projects that create new jobs for the local community				0.731
We support programs aimed at local development				0.735
Variance Explanation Ratio	**62.659% N: 8**	**65.852% N:9**	**60.176% N:7**	**69.622% N:7**

Table 3: Reliability of Dimensions with Cronbach's Alpha Values

Dimensions	Number of Items	CA (Cronbach's Alpha):
Personnel Practices	8	0.914
Environmental Practices	9	0.932
Social Practices	7	0.889
Socio-economic Practices	7	0.927
General (Social Innovation)	31	0.941

To determine whether the scale measures social innovation or not, item total correlation analysis was carried out. If the item total correlation is positive and high, it means the internal consistency of the scale is high (Bozdoğan and Öztürk, 2008). The item total correlation analysis results are given in Table 4. When the coefficient of item total correlation is r≥0.40, this indicates that the item is a very good item (Büyüköztürk, 2003).

As seen in Table 4, the "r" value of all items is greater than 0.40. T values were also found to be significant at the 0.01 level. Therefore, it can be said that the scale is aimed at measuring social innovation.

The confirmatory factor (DFA) analysis of the large sample data was performed using the LISREL software program. Table 5 summarizes the results of the structural equation modeling. The DFA result was very satisfactory for the goodness of fit values obtained. The chi-square value was calculated as 2249.73 and the degree of freedom as 430. Relative Chi-Square Indicator, a method that makes the chi-square less dependent on the sample size, is obtained from the ratio of the chi-square to the degree of freedom. This value is expected to be in the range of 2:1 to 3:1. According to some researchers, a value of 8 or less can be considered sufficient for accepting the model (Ventura, 2011). In this study, the ratio of the Chi-Square value to the degree of freedom was found to be 5.23. Given that the sample volume was large, it can be said that this indicator exceeded the desired value. The RMSEA value was 0.09, which is below the limit value of 0.10%. Until the early nineties, an RMSEA in the range of 0.05 to 0.10 was considered an indication of fair fit, while an RMSEA above 0.10 was an indication of poor fit (MacCallum et al., 1996). Now, new ranges are used, where an RMSEA of between 0.08 to 0.10 is considered a mediocre fit and below 0.08, a good fit (MacCallum et al., 1996). Therefore, the RMSEA for our study was at an acceptable value.

When the standardized values are examined, it is seen that the model indicators fall within the accepted limits.The correlation coefficients of the dimensions were as follows: personnel applications: 0.47 (R2 = 0.22), environmental applications: 0.76 (R2 = 0.58), social applications: 0.89 (R2 = 0.79), and socio-economic applications: 0.85 (R2 = 0.72). According to the results, the most relevant factors related to social innovation in the model were, in order

of relevancy, social applications, socio-economic applications and environmental applications.

Goodness-Of-Fit Index (GFI) shows the degree of general covariance between the observed variables calculated in the default model. The GFI value ranges from 0 to 1. A GFI rate exceeding 0.90 is taken as a good model indicator. This means that enough covariance has been calculated among the observed variables (Ventura, 2011). In this study, GFI was found to be 0.93, indicating that the model has a good fit.

Table 4: Item Total Correlation Analysis

ITEMS	Correlation* n:62	t n:34
We provide paid maternity leave	.519	3.785
We provide paid leave to personnel to vote in elections	.407	3.057
We provide employment for under-represented groups (racial minorities, veterans, disabled).	.536	4.068
We include personnel in the decision-making process	.450	3.725
We have a salary strategy for income inequity between personnel	.430	3.818
Employees are provided with job security	.676	5.158
We use new technologies to meet the social needs of personnel	.612	5.231
We pay a reasonable wage for all full-time personnel	.524	4.750
We use clean and/or low emission transportation options	.437	3.523
We provide financial incentives to employees for efficiency (energy-saving vehicles, etc.)	.501	4.035
We produce renewable energy in our firm	.524	4.304
Precautions are taken for climate change	.601	6.025
R&D activities for the environment are being carried out	.620	6.636
Pollution control technologies are used	.659	7.945
Waste management is implemented	.649	8.025
Cleaning technologies are used	.706	10.210
Environment diagnosis and monitoring technologies are used	.808	14.091
We produce a product or service aimed at the benefit of the community.	.600	5.3791
We support local suppliers	.589	5.376
We support projects aimed at local community health	.667	6.047
We offer assistance for local community security	.692	5.724
We develop products /services that will create social change in society	.518	4.455
We are putting new ideas into practice to create social value for society	.499	3.898
We support projects that aim to create new public areas	.513	4.517
We donate services, products, supplies or equipment to society	.481	3.865
We support programs for individual and / or community health	.633	5.480
We donate to primary and high school education	.615	5.307
We donate to higher education	.577	4.289
We support economic equality in the society	.600	4.431
We support projects that create new jobs for the local community	.670	5.200
We support programs aimed at local development	.599	4.233

*Significance Level 0.01

The NFI (Bentler Bonett Index or Normed Fit Index) is used to identify any differences between the hypothesized model and the null model, where the goal is to determine the amount of fitness that is improved by using the hypothesized model. In other words, when compared to the suitability of the null hypothesis, it shows the amount of increase in fitness achieved using the hypothesized model and takes a value between 0-1. The value must be above 0.90, and the closer the value is to 1 the better the fit (Ventura, 2011). NFI was found to be 0.91 in this study, and therefore, the model was determined to have adequate good fit.

As the Root Mean Square Residual (RMR) value approaches 0, it is understood that the tested model shows good fit (Ventura, 2011). In this study, RMR was found to be 0.09, a relatively good value. The standardized RMR is referred to as the SRMR indicator of good fit, and the closer the SRMR value is to 0, the better the fit of the model (Ventura, 2011). In this study, the SRMR was found to be 0.099, which is considered a good fit in terms of the SRMR.

The Comparative Fit Index (CFI) compares the fit of the current model with the correlation of latent variables and the fit of the null hypothesis model, which ignores covariance. CFI values range from 0-1. A model with a higher CFI indicates that the model has a good comparative fit index (Ventura, 2011). In this study, the CFI was found to be 0.93.

The AIC-Models and the ECVI comparison model should be smaller than the AIC and ECVI values (Erkorkmaz et al., 2013). In this study, the AIC-Model was found to be 2381.73 <24170.28 and the ECVI 6.01 <60.65 Therefore, the model has a good fit. Values of fit indexes are summarized in followed Table.

Table 5. Values of Fit Indexes of the Model

Fit Index	Value	Result
x^2/df	5.23	Acceptable
RMSEA	0.09	Acceptable
GFI	0.93	Good Fit
NFI	0.91	Good Fit
RMR	0.09	Acceptable
SRMR	0.099	Good Fit
CFI	0.93	Good Fit
AIC-Model	2381.73<24170.28	Good Fit
ECVI	6.01<60.65	Good Fit

In general, the index values obtained are acceptable for a model. In conclusion, the DFA result of the goodness of fit values shows that the model is good.

5. CONCLUSION

In this study, a 62-itemed scale to measure the social innovation applications of entrepreneurs was presented to an expert for scope validity. Afterwards, factor analysis was carried out using data obtained from managers of selected travel agents operating in Antalya. As a result of this process, the 62 items on the scale were reduced to 31 items. Additional analyses performed included an item analysis based on the reliability coefficients of all scales and sub-dimensions, a factor-based discrimination analysis, and calculation of item-total and lower-27% and upper 27% group averages. A structural equation model was established with data collected from 397 tourism enterprises operating in Antalya. The results obtained from the analyses can be summarized as follows:

- ✓ Skewness and Kurtosis values confirm the normal distribution of obtained data.
- ✓ The KMO test confirms that sample size is appropriate for factor analysis and the Bartlett's test shows that the data are derived from a multivariate normal distribution.
- ✓ The total variance explained by the four factors in the developed social innovation scale is 68.729%. The factor loadings of the items, as determined by varimax rotation, range from 0.518 to 0.911.
- ✓ The obtained factors are designated as "personnel practices", "environmental practices", "social practices" and "socio-economic practices".
- ✓ The Cronbach's alpha value for the whole scale is 0.94 and the Cronbach's alpha coefficients for each sub-dimension are over 0.88. These results indicate that the scale as a whole and its sub-dimensions have internal consistency.
- ✓ In the factor-based discrimination analysis, the difference between the lower 27% and upper 27% groups was found to be statistically significant ($p < .001$), suggesting that the dimensions and total scores of the scale are distinctive.
- ✓ The item total coefficients range from 0.40 to 0.80. This result confirms that the scale is aimed at measuring social innovation.
- ✓ The indices obtained from the structural equation model are within accepted ranges.

The results of all the validity and reliability analyses performed reveal that the developed scale is a tool that can be used to measure the social innovation perception of entrepreneurs.

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