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Procedia - Social and Behavioral Sciences 58 (2012) 879 – 888

Procedia
Social and Behavioral Sciences

8th International Strategic Management Conference

The effect of locus of control orientation on perceived individual innovativeness: An empirical research in Turkey

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Abstract

The aim of this study is to measure the effect of locus of control (LOC) orientation on perceived individual innovativeness in Turkey. A second aim is to try to find the possible role of gender in this relation. In order to test the propositions, a field survey using questionnaires was conducted in a sample of 314 undergraduate students enrolled at Marmara University, Turkey. Results indicated that there was a significant negative relationship between external locus of control and level of perceived individual innovativeness. A significant difference between female and male students on the relation between individually perceived LOC orientation and innovativeness was also found.

Keywords: Locus of control, individual innovativeness, Turkey.

1. Introduction

One of the most noteworthy statements of Steve Jobs was; *"Innovation has nothing to do with how many R&D dollars you have. When Apple came up with the Mac, IBM was spending at least 100 times more on R&D. It's not about money. It's about the people you have, how you're led, and how much you get it"* (Kirkpatrick, 1998). As Mr. Jobs mentioned, successful innovations require more than just the R&D spending.

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1877-0428
doi:10.1016/j.sbspro.2012.09.1066

In the past, innovation measurement is also tended to be confined to R&D. This is frequently considered unsatisfactory since the innovation process also requires a number of non-R&D activities such as the acquisition of patents and licenses, design, training of personnel, market research and investment in new production capacity (Türker, 2011).

To build an innovative organization, leaders need more than money. A shared vision through the organization, leadership, will to innovate, an organization design which enables creativity, learning and interaction, some key individuals who will energize or facilitate innovation, an effective team working, continuing individual development, high involvement, a creative climate and being a learning organization are the main components or needs of an innovative organization (Tidd, et al. 2005).

Innovation is essentially about change and it is often disruptive, risky and costly. Innovation requires determination to change the order of things (Tidd, et al. 2005). The belief that "I can change the order of things happening, I can control and change my future" is related with locus of control (LOC) orientation. This study is related with this individual stimulus.

Our research questions were appeared in this point; what is the effect of locus of control orientation on perceived individual innovativeness? Is there a significant difference between women and men on the relation between individually LOC orientation and perceived individual innovativeness?

2. Literature Review

First proposed by Julian Rotter in the 1950s, LOC concerns one's beliefs about who or what is the source of reinforcement for one's behaviour (Rotter, 1990; Runco and Pritzker, 1999). LOC usually considered as one of the major personality attributes influencing organizational behaviour. Robbins, stated LOC as a person's perception of the source of his or her fate. One type of people, those who believe that they control their destinies, have been labelled "internals", whereas an other type, who see their lives as being controlled by outside forces, have been called "externals" (Robbins, 1998).

There have been dozens of studies in the last decades examining the relationship between creativity and having an internal LOC. The vast majority of these studies have shown that creative people are more likely to have an internal orientation than less creative people (Runco and Pritzker, 1999). In the other hand, the relation between LOC and innovativeness was not studied as much as the relation between LOC and creativity. This situation also raises the need of this study.

Literature indicates that, the top managers of innovative companies have an internal 'locus of control' orientation. They consider that the performance of their firm depends on manageable practices rather than the influence of external environmental factors which they cannot control (Shavinina, 2003; Miller, et al. 1982).

When Rotter's scale was first developed and tested using a sample of 575 male and 605 female university students in USA, the overall patterns of means and standard deviations were roughly the same for males and females. As the research continued, it was noted that females scored more externally than males but the differences were not meaningful (Sherman, et al. 1997). There are several other studies that search a possible significant difference in LOC orientation due to gender. In most of them researchers found significant differences. Rubinstein (2004) found that the LOC orientation of women is more external than that of men among 50 pairs of parents in Israel. Smith et al. (1997) found that females tend to score more externally on Rotter's LOC scale among 4599 people from 14 countries. Contrary, in a more recent study conducted among 300 entrepreneurs (107 of them female) in Turkey, Kunday (2008) found that female and male entrepreneurs do not differ in terms of their locus of control orientation. As a result we conclude that it is generally acknowledged that LOC orientation differs due to gender except in exceptional circumstances. Maybe we can claim that, the possible difference in LOC orientation due to gender is related with some other variables for example; culture, level of education, age, etc.

3. Theoretical Framework

This study will attempt to answer the main research question: What is the effect of locus of control orientation on perceived individual innovativeness? The study concerned the relationship between two types of variables; dependent and independent. The dependent variable of this study is individually perceived innovativeness. The independent variable is perceived LOC orientation. The proposed relation between variables is shown in the figure below.

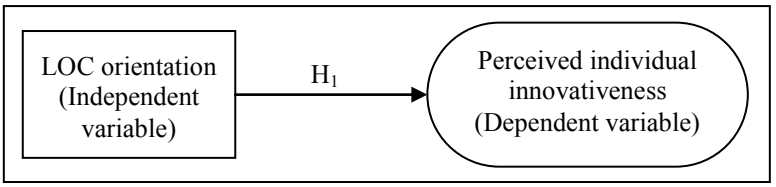


Figure.1 The conceptual model for the effect of locus of control orientation on perceived individual innovativeness

The hypotheses and sub-hypothesis of this study are;

$H_{1.0}$: Perceived internal locus of control orientation has not a positive effect on perceived individual innovativeness.

$H_{1.1}$: Perceived internal locus of control orientation has a positive effect on perceived individual innovativeness.

$H_{1.1.0}$: The belief in personal control has not a positive effect on perceived individual innovativeness.

$H_{1.1.1}$: The belief in personal control has a positive effect on perceived individual innovativeness.

$H_{1.2.0}$: The belief in chance has not a negative effect on perceived individual innovativeness.

$H_{1.2.1}$: The belief in chance has a negative effect on perceived individual innovativeness.

$H_{1.3.0}$: The belief in meaninglessness of the effortfulness has not a negative effect on perceived individual innovativeness.

$H_{1.3.1}$: The belief in meaninglessness of the effortfulness has a negative effect on perceived individual innovativeness.

$H_{1.4.0}$: The belief in fate has not a negative effect on perceived individual innovativeness.

$H_{1.4.1}$: The belief in fate has a negative effect on perceived individual innovativeness.

$H_{1.5.0}$: The belief in an unjust world has not a negative effect on perceived individual innovativeness.

$H_{1.5.1}$: The belief in an unjust world has a negative effect on perceived individual innovativeness.

$H_{2.0}$: There is not a significant difference between female and male students on their locus of control orientation.

$H_{2.1}$: There is a significant difference between female and male students on their locus of control orientation.

$H_{3.0}$: There is not a significant difference between female and male students on perceived individual innovativeness.

$H_{3.1}$: There is a significant difference between female and male students on perceived individual innovativeness.

$H_{4.0}$: There is not a significant difference between female and male students on the relation between perceived LOC orientation and perceived individual innovativeness.

$H_{4.1}$: There is a significant difference between female and male students on the relation between individually perceived LOC orientation and innovativeness.

4. Methodology of the Research

4.1 Sample and Data Collection

The purpose of this study is to amplify our understanding of the effects of perceived LOC orientation on perceived individual innovativeness, such purpose make our research been classified as casual research. Data were collected from a sample of undergraduate students attending Marmara University, Faculty of Economic and Administrative Sciences, Department of Business Administration at İstanbul in March 2012. These students were recruited through various classes with the permission of instructors. The instrument administered to the students surveyed their attitudes and perceptions about their locus of control orientation and individual innovativeness. The survey instrument was composed of 67 items in two scales. Respondents were additionally instructed to provide specific biographical information so they could be categorized by age, gender, and year of education.

University students were selected as subjects for this study for the reason that; today's university students, we believe, represent a significant share of the pool of potential entrepreneurs in the developing countries like Turkey. As the demands of technology and global competition increases, the need for university-trained entrepreneurs will becomes more evident, and success in business will increasingly be dependent upon the founder's education and training (Mueller and Thomas, 2000).

At the beginning of the study we planned to measure perceived LOC using the well-known instrument developed by Rotter. It is known as the "I-E scale". One point is given for each *external* response to a question. The higher the score on the instrument, the more external the subject (Miller, et al. 1982). Rotter's I-E Scale was adapted to Turkish in an earlier study by Dağ (1991) but many participants criticised the two choice response format of it, as not agreeing with both alternatives of many items. Original I-E Scale was also transformed to Likert format with similar arguments. Furthermore, some important control areas such as health were not included in the I-E Scale (Dağ, 2002). In addition, the results of researches that measure the dimensionality and reliability shows that; a single total internal-external score may not accurately depict the attitudes of the individual in every situation and its use may lead to significant errors of prediction (Lange and Tiggemann, 1981).

Thus, we decided not to use the original Rotter's I-E Scale and instead of this scale we prefer to use Dağ's locus of control scale (LCS). Dağ, had developed LCS other than "Rotter's Internal-External Locus of Control Schedule" for Turkish samples in 2002 (Dağ, 2002). LCS is a Likert type interval scale consists of 5 factors and 47 items in total.

In order to measure perceived individual innovativeness, we used an adaptation of the Innovativeness Scale (IS) which developed by H. Thomas Hurt et al. in 1977 to Turkish by Kılıçer and Odabaşı. "IS" is also a Likert type scale consists of 20 items in total (Kılıçer and Odabaşı, 2010). Both scales were subjected to reliability testing using data collected in this study.

Data was gained with two approaches, as distributing surveys in hand and inviting to join the online electronic survey. The questionnaire forms were exactly the same in both paper survey and online survey. Thus, the data collected was cross-sectional. Participation to research was relying on essence of voluntary. Respondents were asked to indicate the extent to which they agreed or disagreed with each item by choosing one of five responses: strongly agree, agree, neither agree or disagree, disagree, or strongly disagree. Approximately 300 questionnaires were distributed in hand and 249 of them voluntarily completed and returned. 77 questionnaires came from online survey system consequently the total number of questionnaires collected were 326. Twelve of these questionnaires were not subject to analysis because of missing and/or inconsistent answers. Consequently a total number of 314 questionnaires subjected to analysis.

4.2 Validity and reliability of the study

Results of the reliability and validity study done by Dağ showed that the LCS was a reliable and valid instrument for Turkish college samples, and it has a simpler factor structure than previous Turkish form of the Rotter's I-E Scale (Dağ, 2002). In their "IS" adaptation study, Kılıçer and Odabaşı found that adapted scales' internal reliability co-efficient was 0.82 and test-retest reliability co-efficient was 0.87 (Kılıçer and Odabaşı, 2010). In order to measure internal consistency (reliability) we used Cronbach's alpha statistics. The results of reliability analysis are shown in Table 1.

Table.1 Cronbach's Alpha Values of Scales

	Cronbach's alpha (α)	Number of items
Innovativeness Scale (IS)	.801	20
Locus of Control Scale (LCS)	.893	47
Factor 1 of the LCS: Personal control	.836	18
Factor 2 of the LCS: Belief in chance	.762	11
Factor 3 of the LCS: Meaninglessness of the effortfulness	.799	10
Factor 4 of the LCS: Belief in fate	.644	3
Factor 5 of the LCS: Belief in an unjust world	.544	5

It is important that, the same factor structure in Dağ's study was also obtained in this study. And the factor loadings in two studies are almost the same. This finding increases the validity of the LCS used in this study. The results of one-sample Kolmogorov-Smirnov tests (Asymp. Sig. (2-tailed)) are .063 for LCS and .550 for IS. With these results we can express that the data gathered is distributed normally.

5. Findings

5.1 Demographic characteristics of the sample

As mentioned above, 314 questionnaires subjected to analysis. 51 percent of the sample (n: 160) was female and the other 49 percent (n: 154) was male. This distribution is ideal for measuring the possible differences due gender. The mean age of participants (N=314) was 20.61 years. Table 2 shows the distribution of the sample according to the years of education.

Table.2 Distribution of the sample according to the years of education.

	Frequency	Percent
First year	150	47,8
Second year	88	28,0
Third year	52	16,6
Fourth year	24	7,6
Total	314	100,0

One-Sample Statistics for Locus of Control Scale (LCS) shows that, the mean of the sample is (M = 2.61, SD = .43). It means that, the students in the sample mainly believe that they have internal locus of control. On the other hand, for Innovativeness Scale (IS), the mean of the sample is (M = 3.63, SD = .43). It means that, the students in the sample mainly see themselves innovative. In addition, according to T-Test (One- Sample Test) results, these results are significant.

5.2 Hypothesis testing and results

As mentioned above, the perceived individual innovativeness is dependent and LOC orientation is independent variables of this study and in the first hypothesis we proposed that perceived internal LOC orientation has a positive effect on perceived individual innovativeness. We used ANOVA test for the

first hypothesis and as a result we found that LOC orientation significantly effects perceived individual innovativeness. ANOVA results are shown in Table 3.

Table.3 ANOVA Test Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6,511	1	6,511	38,584	**,000**(a)
	Residual	52,650	312	,169		
	Total	59,161	313			

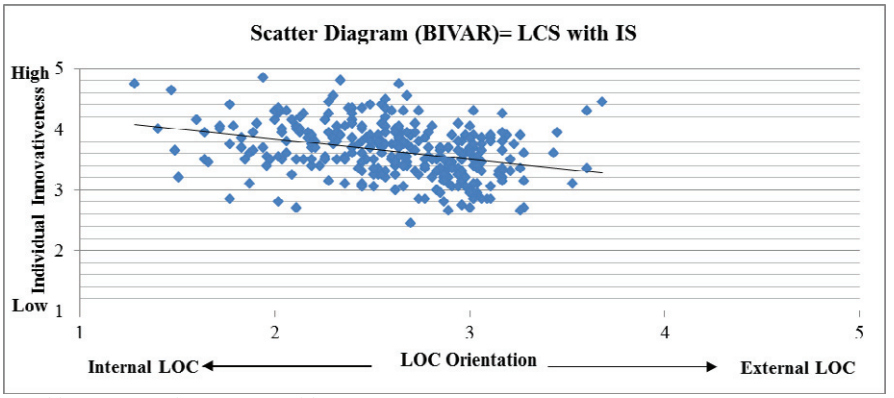
a Predictors: (Constant), LOC orientation
b Dependent Variable: Perceived individual innovativeness

The direction of the above mentioned relationship is negative. It means that, higher external locus of control orientation decreases the perceived individual innovativeness. The strength of the relation is shown in Table 4 and the scatter diagram of the relation between two variables is shown in Graphic 1.

Table.4 Coefficients(a) Table

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	4,499	,142		31,730	,000
	LOC orientation	**-,333**	,054	-,332	-6,212	,000

a Dependent Variable: Perceived individual innovativeness



Graphic.1 Scatter Diagram LCS with IS

The possible effects of each of the factors in LCS on Individual Innovation formed the structure of our sub-hypotheses. In order to test all the sub-hypotheses we used ANOVA test. Results revealed that $H_{1.1.0}$ (The belief in personal control has not a positive effect on perceived individual innovativeness) was not supported. That is, the belief in personal control has a significant effect on perceived individual innovativeness. ANOVA results are shown in Table 5.

Table.5 ANOVA test results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6,136	1	6,136	36,104	**,000(a)**
	Residual	53,025	312	,170		
	Total	59,161	313			

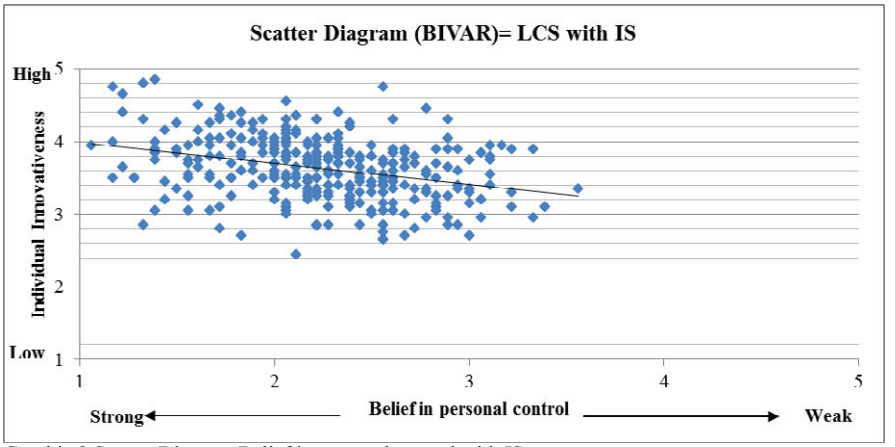
a Predictors: (Constant), Belief in personal control
b Dependent Variable: Perceived individual innovativeness

The direction of the above mentioned relationship is negative. It means that, stronger belief in personal control increases the perceived individual innovativeness. The strength of the relation is shown in Table 6 below and the scatter diagram of the relation between two variables is shown in Graphic 2.

Table.6 Coefficients(a) table

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	4,282	,111		38,576	,000
	Belief in personal control	**-,291**	,048	-,322	-6,009	,000

a Dependent Variable: Perceived individual innovativeness



Graphic.2 Scatter Diagram Belief in personal control with IS

$H_{1.2.0}$ (The belief in chance has not a negative effect on perceived individual innovativeness) was supported. That is, the belief in chance has not a significant effect on perceived individual innovativeness.

$H_{1.3.0}$ (The belief in meaninglessness of the effortfulness has not a negative effect on perceived individual innovativeness) was supported. That is, the belief in meaninglessness of the effortfulness has not a significant effect on perceived individual innovativeness.

$H_{1.4.0}$ (The belief in fate has not a negative effect on perceived individual innovativeness) was supported. That is, the belief in fate has not a significant effect on perceived individual innovativeness.

$H_{1.5.0}$ (The belief in an unjust world has not a negative effect on perceived individual innovativeness) was supported. That is, the belief in an unjust world has not a significant effect on perceived individual innovativeness.

Second and third hypotheses of this study were concerned about a possible difference in LOC orientation and innovativeness due to gender. In order to test these two hypotheses we used T-Test. The group statistics for Locus of Control Scale (LCS) shows that, the mean of female group (M = 2.63, SD = .40) was greater than the mean of male group (M = 2.58; SD = .45). It means that, males have higher internal locus of control than females. However, according to T-Test (Independent Samples Test) results, that difference between female and male groups is not significant. Details are shown in Table 3. Consequently, $H_{2.0}$ (There is not a significant difference between female and male students on their locus of control orientation) was supported. In other words, we couldn't found a significant difference between female and male students on their locus of control orientation.

In contrast, the group statistics for Innovativeness Scale (IS) shows that, the mean of male group (M = 3.69, SD = .44) was greater than the mean of female group (M = 3.56; SD = .41). It means that, males

perceived themselves more innovative than females. In addition, according to T-Test (Independent Samples Test) results, this difference between female and male groups is significant. Details are shown in Table 7. Consequently, $H_{3.0}$ (There is not a significant difference between female and male students on perceived individual innovativeness) was not supported. In other words, we found a significant difference between female and male students on perceived individual innovativeness.

Table.7 T-Test Results.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
LCS	Equal variances assumed	1,701	,193	1,151	312	**,251**	,05626	,04888	-,03992	,15244
	Equal variances not assumed			1,148	304,709	**,252**	,05626	,04899	-,04014	,15267
IS	Equal variances assumed	,195	,659	-2,726	312	**,007**	-,13245	,04858	-,22804	-,03686
	Equal variances not assumed			-2,724	309,324	**,007**	-,13245	,04863	-,22814	-,03676

In order to search a possible difference in the relation between LOC orientation and individual innovativeness due to gender we used ANOVA test. Results revealed that $H_{4.0}$ (There is not a significant difference between female and male students on the relation between perceived LOC orientation and perceived individual innovativeness) was not supported. That is, there is a significant difference between female and male students on the relation between LOC orientation and perceived individual innovativeness. ANOVA results are shown in tables 8, 9, 10 and 11 below. The regression model of gender difference can also be seen in Graphic.2.

Table.8 ANOVA(b,c) test results for female group

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,381	1	1,381	8,239	**,005(a)**
	Residual	26,484	158	,168		
	Total	27,865	159			

a Predictors: (Constant), LOC orientation
b Dependent Variable: Perceived individual innovativeness
c Selecting only cases for which gender = female

Table.9 Coefficients(a,b) table for female group

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	4,168	,213		19,601	,000
	Belief in personal control	**-,229**	,080	-,223	-2,870	,005

a Dependent Variable: Perceived individual innovativeness
b Selecting only cases for which gender = female

Table.10 ANOVA(b,c) test results for male group

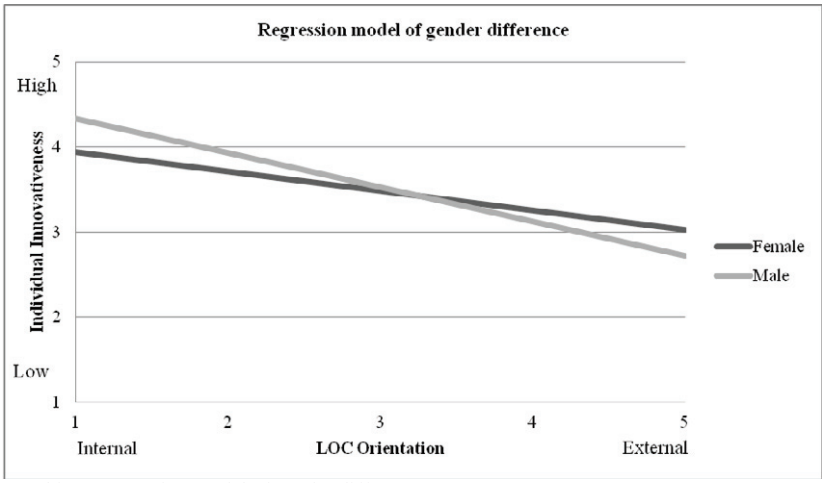
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,212	1	5,212	32,064	**,000(a)**
	Residual	24,707	152	,163		
	Total	29,919	153			

a Predictors: (Constant), LOC orientation
b Dependent Variable: Perceived individual innovativeness
c Selecting only cases for which gender = male

Table.11 Coefficients(a,b) table for male group

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4,737	,187		25,399	,000
	Belief in personal control	**-,403**	,071	-,417	-5,662	,000

a Dependent Variable: Perceived individual innovativeness
b Selecting only cases for which gender = male



Graphic.2 Regression model of gender difference

6. Conclusion

This study, which is conducted on university students in Turkey, highlighted the relationship among the locus of control orientation and perceived individual innovativeness. The university students in the sample mainly believe that they have internal locus of control and see themselves innovative. We can express that this result is logical when we consider the homogeneity of the sample due to the level of education and age variables. We can expect these results among a highly educated and relatively young sample.

The entrepreneurship literature about factors which stimulate new venture creation would seem to suggest that economic incentives to provide the motivation to initiate new ventures are highly important. However, entrepreneurially oriented individuals must also be available in that social structure. Perceived individual innovativeness is one of the factors that form this entrepreneurial orientation. The perceived individual innovativeness of the university students in department of Business Administration is important because they are potential entrepreneurs in the future and "external LOC orientation" is a "usual suspect" of being a barrier in front of their individual innovativeness perception and so their entrepreneurial orientation.

In the results of the hypothesis tests we found that the LOC orientation of students significantly affects their perceived individual innovativeness. Higher external locus of control orientation decreases the perceived individual innovativeness. This finding complies with the LOC literature in general. But if we consider Turkey as a collectivist nation this result may contradict with the expectations that collectivist nations are more external oriented than individualist ones. But in order to generalize this result we must compare our findings with another nation labelled as "individualist". We also found that the belief in personal control has also a significant effect on perceived individual innovativeness. Stronger belief in

personal control increases the perceived individual innovativeness. Contrary, we cannot found a significant effect of the other four factors of LCS on perceived individual innovativeness. This result may intercourse with the small number of items that measure these four LCS factors.

Second and third hypotheses of this study were concerned about a possible difference in LOC orientation and innovativeness due to gender. Contrary to expectations, we couldn't found a significant difference between female and male students on their locus of control orientation. This result may associate with the low average age of the sample. We think that, the necessity for a comparison between different age groups in Turkey will be an issue that should be taken into consideration for further research. In addition, we found a significant difference between female and male students on perceived individual innovativeness. Males perceived themselves more innovative than females. And finally we found that there is a significant difference between female and male students on the relation between LOC orientation and perceived individual innovativeness. We think that, this result depends on the difference between female and male students on perceived individual innovativeness. This result also creates a need for a further study that researches the possible causes of this situation.

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