

# An Examination of Locus of Control, Epistemological Beliefs and Metacognitive Awareness in Preservice Early Childhood Teachers\*

Emine Ferda BEDEL<sup>a</sup>

Canakkale Onsekiz Mart University

## Abstract

This study aims to explore the locus of control, epistemological beliefs and metacognitive awareness levels of preservice early childhood education teachers and to determine the interrelations among these variables. 206 teacher candidates have been asked to fill out Rotter's Internal-External Locus of Control Scale, Central Epistemological Beliefs Scale and Metacognitive Awareness Scale. The statistical analyses revealed that there were meaningful correlations between Locus of Control and the first two factors of Central Epistemological Beliefs Scale, namely, Belief in Supernatural Powers, and Belief in Superstitious Rituals; and between Metacognitive Awareness and the last two factors of Central Epistemological Beliefs Scale, namely, Belief in Science as a Source of Knowledge, and Belief in a Rational Society. Another important finding was that Belief in Supernatural Powers and Belief in Superstitious Rituals were important predictors of Locus of Control.

## Key Words

Early Childhood Education Students, Locus of Control, Epistemological Beliefs, Metacognitive Awareness.

Teacher personality is one of the important qualities determining the effectiveness of a teacher (Pigg & Marso, 1994; Stronge, 2002). Research also indicates that the more sophisticated students' beliefs about knowledge and learning are, the better their thinking and problem solving skills are (Hong & Lin, 2010; Schommer, 1994; Stacey, Brownlee,

Thorpe, & Reeves, 2005). Consequently, locus of control, epistemological beliefs, and metacognitive awareness has been examined within the educational literature, especially in relation to academic achievement, learning and teaching practices.

## Locus of Control

The concept of "perceived control" has initially attracted attention of researchers in the field of psychotherapy due to the differing interpretation of the changes during the process of therapy by patients. It has been observed that some patients attribute the improvements in their psychological state to new experiences acquired through therapy, while some others attribute to the factors such as chance and powerful others unrelated to their own efforts or actions. Various therapists from differing clinical orientations have attempted to explain the differences by such terms as hopelessness, ego strength and the sense of inferiority. However, the best theoretical explanation about this phenomenon has been offered by Rotter (1966) who coined

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<sup>a</sup> **Emine Ferda BEDEL, Ph.D.**, is currently employed as an assistant professor in Canakkale Onsekiz Mart University. Her research interests include beliefs and personality of teacher candidates, museum education and virtual learning in young children. Correspondence: Assist Prof. Emine Ferda BEDEL, Canakkale Onsekiz Mart Universitesi Egitim Fakultesi, C Blok Oda No: 110, 17100 Canakkale/Turkey. E-mail: ferdabedel@hotmail.com Phone: (+90) 286 217 0954/3113.

the term “locus of control”. Rotter has formulated the concept of locus of control within the framework of his Social Learning Theory and defined it as the general belief of a person about the extent to which the consequences of events are under his/her own control. According to his definition, individuals who believe that the events are controlled by their own actions and traits are considered to have internal locus of control, while those who believe that they are driven by such factors as other people or chance, uncontrolled by themselves, to have external locus of control Rotter. According to Rotter, individuals with external locus of control inclination, unlike those with internal locus of control, prefer to avoid taking responsibility and to remain passive rather than fight when faced with environmental conflict. The concept of locus of control has attracted attention of researchers from various fields and has been explored by several studies in the field of education to this day. In the study of Murray and Stabeler (1974), the locus of control of elementary school teachers and students has been explored. As a result, it has been determined that whether the students have external or internal locus of control, the students taught by teachers with internal locus of control score higher in tests than those taught by teachers with external locus of control. McIntyre (1984) has found out that teachers with external locus of control express more exhaustion. Bein, Anderson, and Maes (1990) have discovered that secondary school teachers with internal locus of control had greater job satisfaction. Sunbul (2003) explored the locus of control, exhaustion and job satisfaction of high school teachers in Turkey. Consistent with those of McIntyre, and Bein et al., it has been found out that teachers with internal locus of control have higher job satisfaction and exhibit lower levels of exhaustion. An overview of more recent research reveals similar results that having internal locus of control is related with more positive situations/variables than having external locus of control. A study by Gifford, Briceno-Perriott and Mianzo’s (2006) study encompassing 3066 college students indicated that students with internal locus of control have higher grade points average, while those with external locus of control have lower GPA and higher dropout risk. It has been put forward that locus of control concept is related not only with academic achievement, but also with adaptation to life at university. Estrada, Dupoux, and Wolman (2006) reported that locus of control is related with university students’ social and personal-emotional adaptation. As the internal locus of control in-

creases, the level of adaptability also increases. A study in Turkey has revealed consistent results that university students with external locus of control rank higher in anxiety points and students with internal locus of control rank higher in coping with stress (Arslan, Dilmac, & Hamarta, 2009). Though few, there are also studies investigating the locus of control among preschool teachers and teacher candidates. In a study by Bedel (2008) locus of control and attitudes toward the teaching profession have been examined. It has been shown that teacher candidates with external locus of control, in other words those who believe that the outcome of events depend on factors out of their own control, present more negative attitudes toward the teaching profession. Cinko (2009) explored the influence of the locus of control of preschool teachers working in public and private institutions on their teaching attitudes. This study revealed that the teachers in private institutions compared to those in public institutions and teachers with vocational high school degree compared to those with graduate degree incline to more external locus of control. Besides, it has been discovered that democratic attitudes increase in parallel to internal locus of control, while autocratic attitudes increase in parallel with external locus of control. In Cakır’s study (2010) that examines the relations between preschool teachers’ locus of control and understanding of discipline, meaningful correlations have been discovered. According to the findings of this study, teachers with internal locus of control have more democratic discipline orientations.

### Epistemological Beliefs

Epistemological beliefs are conceptualized as the “individual’s belief as to the nature of knowledge and the means of acquiring it” (Schommer, 1994, p. 25). Studies examining the epistemological beliefs of students are dated back to Perry’s (1968) research exploring the epistemological development of college students in Harvard and Radcliffe Colleges. Perry worked on how students’ thoughts and beliefs were developed over their 4-year college experience. His interview findings indicated that most of the freshmen believe that facts are unchangeable, simple and delivered by the authority. When they reach the end of their education however, they adopt a more relativist point of view (Perry). This influential study served as a theoretical framework for later research in the field of epistemological beliefs (Hofer & Pintrich, 1997; King & Magun-Jackson, 2009; Schommer, 1994; Schommer-Aikins, 2002).

Another important contribution to the field of epistemological research was made through the studies of Schommer and her colleagues. Schommer (see Schommer 1990, 1993, 1997; Schommer & Walker, 1995) proposed a multidimensional model of epistemological beliefs and developed the first quantitative scale of epistemological beliefs confirming the multidimensionality of epistemological beliefs (King & Magun-Jackson, 2009). Her study yielded the following dimensions of epistemological beliefs: Fixed Ability, Quick Learning, Simple Knowledge, and Certain Knowledge (Schommer 1993, 1997; Schommer & Walker, 1995). Consequently, epistemological beliefs have been examined in a number of studies in relation to a range of variables including moral reasoning, teaching practices of both pre-service and in-service teachers, and locus of control: Topcu (2011) has examined epistemological beliefs in relation to moral reasoning in student teachers and his findings indicated that epistemological beliefs were not related to moral reasoning in student teachers. Otting, Zwaal, Tempelaar, and Gijssels (2010) found that students who do not believe in teachers as the main source of expertise tend to have constructivist conceptions of teaching and learning and that the 'certainty of knowledge' dimension was positively related to the traditional conception of teaching and learning. Similarly, Aypay's (2010) study indicated that as the 'certainty of knowledge' scores increase, the 'democratic teaching approach' scores decrease. In their review of research on epistemological beliefs and early childhood teaching practices Brownlee and Berthelsen (2006) conclude that teachers with relativistic beliefs are more likely to adopt constructivist practices, whereas teachers who believe that knowledge is absolute and certain have less tendency for seeking out new knowledge. Some researchers examined the relationship of epistemological beliefs to locus of control. Yilmaz and Kaya (2010) have examined the relationship between epistemological beliefs and locus of control in nursing students and found that a very weak positive correlation existed between the locus of control and Effort and Ability dimensions of epistemological beliefs. Similarly, Terzi, Cetin, and Eser (2012) found a weak but significant correlation between undergraduate students' locus of control and their epistemological beliefs concerning the factor 'learning is based on one's ability'.

### Metacognitive Awareness

Metacognition has first been termed by Flavell (1976) and defined as the knowledge about cogni-

tive processes and regulation of cognitive processes (Flavell, 1987). By the same token, most researchers have agreed that metacognitive knowledge is distinct from regulation or skills and metacognition is a multicomponent construct (Schraw & Moshman, 1995; Veenman, Van Hout-Wolters, & Af-flerbach, 2006). Metacognition consists, according to; Flavell (1987) of metacognitive knowledge and metacognitive experiences, Jacobs and Paris (1987) of self appraisal of cognition and self-management of cognition, Henri (1992) of knowledge of cognitive activities and knowledge management and control of cognitive activities, Brown (1994) of knowledge and feelings about learning and control of learning. Similarly, Schraw, and Sperling-Dennison (1994) divide metacognition into knowledge of cognition and regulation of cognition. Knowledge of cognition is defined as the "individuals' knowledge about their cognition or cognition in general" (Schraw & Moshman, 1995, p. 352). Regulation of cognition consists of at least three components including declarative knowledge (knowing about things), procedural knowledge (knowing how to do things) and conditional knowledge (knowing when and why cognitive actions are executed) (Schraw 1998; Schraw & Moshman, 1995). Regulation of knowledge, on the other hand, refers to a set of cognitive activities that facilitate the control aspect of learning. Regulation of knowledge involves five components: planning (selecting appropriate cognitive strategies), information management (strategies used to manage information efficiently) monitoring (awareness of progress or performance during a cognitive task) debugging strategies (strategies used to correct performance errors) and evaluation (appraisal of the efficiency of learning) (Schraw 1998; Schraw & Moshman, 1995). Despite general agreement on the importance and multicomponent structure of metacognition, its conceptualization is a matter of debate (Schraw & Moshman, 1995). This situation is partly due to metacognitive research originated in different disciplines such as developmental psychology, cognitive psychology or philosophy of mind with different purposes (Amado Gama, 2004).

Metacognition has received considerable attention in the educational literature. A number of studies have documented the link between metacognitive awareness and learning, academic achievement, problem solving, and additionally with epistemological beliefs and locus of control. A meta-review by Wang, Haertel, and Walberg (1990) has revealed that metacognition is one of the most powerful predictors of learning. Young and Fry (2008) found

that both knowledge of cognition and regulation of knowledge were positively related to overall GPA and end of course grades in college students. Ozsoy and Gunindi (2011) have examined metacognitive awareness levels in preservice early childhood teachers. Their findings indicated that the students had moderate levels of awareness and there were no significant differences by gender and high school type they have graduated from. Higher metacognitive awareness is also found to be related to the more positive problem solving approach in comparison to lower levels of awareness in preservice early childhood education teachers (Gursimsek, Cetingoz, & Yoleri, 2009).

A limited number of studies have examined metacognitive awareness in relation to locus of control or epistemological beliefs. Landine and Stewart (1998) have reported no significant correlation between metacognition and locus of control as they found significant positive relationship between the use of metacognition, and motivation, as well as self-efficacy. Scarborough (1986) has found a negative correlation between Locus of control and metacognition in high school students, meaning metacognition scores tended to decrease as externality orientation increase. In terms of the relationship between metacognition and epistemological beliefs, research data has shown that more sophisticated epistemological beliefs are related to higher levels of metacognition (Bromme, Pieschl, & Stahl, 2010). Belet and Guven (2011) have found a low but significant relationship between the use of metacognitive strategies and epistemological beliefs in preservice teachers.

To put together, locus of control, epistemological beliefs and metacognitive awareness are important to examine in students since the research data indicates that they potentially influence the learning outcomes and teaching practices. Furthermore, exploration of these variables in early childhood teacher candidates become more viable since early childhood teachers serve as a significant role models for young children who are more likely to be influenced by their teachers' beliefs and attitudes and who are more likely to internalize these perspectives.

In this study, the following research questions will be addressed:

1. What are the descriptive characteristics of preservice early childhood teachers' scores on Locus of Control Scale, Central Epistemological Beliefs Scale, and Metacognitive Awareness Inventory?
2. What relationships exist, if any, among preservice early childhood education students' locus of control, epistemological beliefs and metacognitive awareness scores?
3. To what extent, if any, is the locus of control influenced by the subfactors of Central Epistemological Beliefs, General Metacognitive Awareness, Knowledge of Cognition and Regulation of Cognition?

## Method

### Participants

The subjects of this investigation were composed of 206 undergraduate students majoring in early childhood education during the spring semester of 2012 in a state university in Turkey. Of the participants, 187 were female students (91%) and 19 were male students (9%). The majority of the test subjects were females because early childhood education is the one of the most female dominated subject areas in Turkey.

### Measures

Three instruments were used to collect data in this study: Rotter's Internal-External Locus of Control Scale, Central Epistemological Beliefs Scale and Metacognitive Awareness Scale.

#### Rotter's Internal-External Locus of Control Scale:

Rotter's Internal-External Locus of Control Scale was developed by Rotter (1966) and consists of 29 forced-choice items. This scale is aimed to measure to what extent an individual believe that an event is contingent upon his/her actions or that an event is beyond his/her control. Test-retest reliability ranged from .70 to .80, and Cronbach's alpha coefficients of internal consistency ranged from .65 to .79 (Rotter). The scale adapted for Turkish by Dag (1991) and consists of 29 pair of statements, with 6 filler items. Dag (1991) reported that Cronbach's alpha coefficient was .71, KR-20 reliability was .68, and test-retest reliability was .83 for his study. For the current sample, Cronbach's alpha coefficient of the scale was .70 (N=189). The scores can be obtained from the scale ranges between 0 and 23, with higher scores are indicative of greater internality.

#### Central Epistemological Beliefs Scale:

Central Epistemological Beliefs Scale was developed by Oksal, Sensekeri, and Bilgin (2006) and consists of 23 Likert-type items measuring 4 sub-factors: (1) Belief in science as a source of knowledge in-

cludes 7 items and possible scores are range from 7 to 35. The reported Cronbach's alpha is .85 and the normative mean is 21. (2) Belief in a rational society includes 6 items and possible scores are range from 6 to 36. The reported Cronbach's alpha is .77 and the normative mean is 18. (3) Belief in superstitious rituals includes 6 items and possible score are range from 6 to 30. The reported Cronbach's alpha is .75 and the normative mean is 18. (4) Belief in supernatural powers includes 4 items and possible scores are range from 4 to 20. The reported Cronbach's alpha was .66 and the normative mean is 12. Each subscale is scored individually and higher scores reflect higher and stronger beliefs. Cronbach's alpha coefficients of the subscales for the current study were .83 (N=200), .67 (N=203), .75 (N=201), and .74 (N=203), respectively.

**Metacognitive Awareness Scale:** This scale developed by Schraw and Sperling-Dennison (1994); and adapted for Turkish by Akin, Abaci, and Cetin (2007). Metacognitive Awareness Scale is a 52-item, Likert-type scale measuring the following subfactors: Knowledge of Cognition encompassing declarative knowledge, procedural knowledge, conditional knowledge and Regulation of Cognition containing planning, monitoring, evaluation, debugging, and information management. Akin et al. (2007) reported adequate reliability and validity for the scale. Cronbach's alpha coefficient was reported as .95 (for sub-scales  $\alpha$  ranges .66 from to .87) and test-retest reliability as .95 (for sub-scales  $r$  ranges from .93 to .98). In terms of scoring, the minimum score is 52 and the maximum score is 260, with higher scores reflect higher levels of metacognitive awareness. In evaluation of scores from the scale, the total score is divided by 52. If the result is higher than 2.5, it is interpreted as an indicator of high metacognitive awareness, whereas if the result is lower than 2.5, it can be considered as an indicator of low metacognitive awareness. For the current sample, the Cronbach's alpha was .94 (N=191) for the whole scale, and it was ranged from .65 to .77 for the subscales.

### Procedure and Data Analysis

Three instruments including Rotter's Locus of Control Scale, Central Epistemological Beliefs Scale and Metacognitive Awareness Inventory were distributed during regular class hours. Data were collected during regular class hours from students who were in attendance on the days that the instruments were administered. Participation in the study was volun-

tary and no incentives were offered for the participation. The completion of the instruments took approximately 50 minutes. The SPSS software (version 18.0) was used to calculate descriptive statistics, correlations and regression analyses.

## Findings

The findings presented in this section are divided into three parts: (1) Descriptive statistics regarding pre-service teachers' Locus of Control Orientations, Central epistemological beliefs, and metacognitive awareness, (2) Relationships among the variables, and (3) Regression analyses.

### 1. Descriptive Statistics of the research variables

Means and standard deviations are reported in Table 1. For Locus of Control Scale, group mean was found to be 11.70 ( $n=189$ ;  $Sd=3.98$ ). Means of the factors of Central epistemological belief scale were 22.20 ( $n=201$ ;  $Sd=5.22$ ), 23.23 ( $n=203$ ;  $Sd=3.38$ ), 13.07 ( $n=201$ ,  $Sd=4.10$ ) and 15.30 ( $n=203$ ,  $Sd=3.40$ ), respectively. When compared to the normative means, the participants of the current study presented higher means for the 3 factors (Belief in science a source of knowledge, Belief in a rational society, and Belief in supernatural powers scores) and a lower mean for one factor (Belief in superstitious ritual).

**Table 1.**

*Descriptive Statistics for Locus of Control, Subscales of Central Epistemological Beliefs, Subscales of Metacognitive Awareness Inventory and General Metacognitive Awareness*

Variables	N	$\bar{x}$	Sd
<i>Locus of Control</i>	189	11.70	3.98
<i>Belief in Science as a Source of Knowledge</i>	201	22.20	5.22
<i>Belief in a Rational Society</i>	203	23.23	3.38
<i>Belief in Superstitious Rituals</i>	201	13.07	4.10
<i>Belief in Supernatural Powers</i>	203	15.30	3.40
<i>Knowledge of Cognition</i>	200	64.12	9.07
<i>Declarative Knowledge</i>	204	27.13	3.95
<i>Procedural Knowledge</i>	204	14.40	2.58
<i>Conditional Knowledge</i>	204	22.60	3.44
<i>Regulation of Cognition</i>	196	128.76	18.97
<i>Planning</i>	201	25.52	4.24
<i>Monitoring</i>	205	29.64	5.70
<i>Evaluation</i>	206	21.26	3.72
<i>Debugging</i>	205	18.40	3.18
<i>Information Management</i>	202	34.42	5.31
<i>General MAI</i>	191	192.83	27.13

Note: Normative means for the subfactors of Central Epistemological Beliefs are 21, 18, 18, and 12.

**Table 2.**  
Intercorrelations among Variables

Locus of Control Society	Belief in Science Rituals	Belief in Rational Supernatural Powers	Belief in Superstitious Rituals	Belief in Supernatural Powers
<i>Locus of Control</i>	1.00	-.13	-.05	.31**
<i>K.of Cognition</i>	-.09	.22**	.21**	.12
<i>Declarative K.</i>	-.14	.26**	.20**	.12
<i>Procedural K.</i>	-.10	.16*	.19**	.05
<i>Conditional K.</i>	-.08	.15*	.17**	.13
<i>Regulation of C.</i>	-.09	.20**	.19**	.07
<i>Planning</i>	-.09	.23**	.15*	.01
<i>Monitoring</i>	-.03	.10	.13	.09
<i>Evaluation</i>	-.19**	.13	.08	.05
<i>Debugging</i>	-.08	.15*	.09	.06
<i>Information Man.</i>	-.07	.20**	.24**	.08
<i>General MAI</i>	-.16**	.30**	.21**	.09

\*P < .05, \*\*P < .01

As seen in the Table 1, mean for the General MAI was 192.83 (n=191, Sd=27.13), for Knowledge of Cognition was 64.12 (n=200; Sd=9.07), and for Regulation of Cognition was 128.76 (n=196, Sd=18.97). Furthermore, calculation of the scores by using the formula provided by authors revealed that almost all of the participants (98%) had higher than cut-point of 2.5. Taken together, it can be concluded that the participants presented higher levels of Metacognitive Awareness.

**The Relationships among Variables**

To determine the relationships between variables Pearson Product Moment Correlations were computed. Table 2 displays the results.

In terms of the relationship between Locus of Control and Central Epistemological Beliefs, findings indicated the existence of a positive correlation between locus of control and the third subfactor (Beliefs in Superstitious Rituals) (r=.31, p<.01) and the fourth subfactor (Beliefs in Supernatural Powers) (r=.27, p< .01). Examination of the relationships between Locus of Control and General Metacognitive Awareness, yielded that Locus of Control was significantly but weakly related to General Metacognitive Awareness in (r=-.16, p<.01) and its Evaluation subfactor (r=-.19, p<.01) both in a negative direction. There were no significant relationships between Locus of Control and the other metacognitive awareness dimensions. Belief in Science subfactor of the Central Epistemological Beliefs Scale was significantly related to general Metacognitive Awareness and its 8 subfactors. The strongest relationship was found between Belief in Science and General Metacognitive awareness

(r=.30, p<.01). Likewise, Belief in Science was significantly and positively related to overall Metacognitive awareness and to most of the subfactors of Metacognitive Awareness Scale, with highest associations were observed with the information management sub factor (r=.24, p<.01) and the General Metacognitive awareness (r=.21, p<.01). Belief in Superstitious Rituals and Belief in Supernatural powers were not related to any subfactor of Metacognitive Awareness Scale or General Metacognitive Awareness scores..

**Regression Analyses**

A multiple regression analysis was performed with Locus of Control as the dependent variable and factors of Central Epistemological Beliefs and General Metacognitive Awareness as the independent variables. This initial regression analysis provided an examination of all variables entered in the regression equation, regardless of their statistical significance. Collinearity diagnostics from the regression output revealed no collinearity problem. In addition, assumptions were met regarding linearity, homoscedasticity and normality of residuals. Table 3 contains those results.

Using enter method, a significant model emerged (F5-159=6.72, p<.001, R<sup>2</sup>=15).

Only three variables (Belief in Superstitious Rituals, Belief in Supernatural Powers) had statistically significant predictive effect on Locus of Control and all together, independent variables explained 17% of the Locus of Control. Subsequently, a Stepwise regression analysis was used to determine the contribution of each of these variables in predicting Locus of Control. A reduced model explaining the predictive ability of Belief in Superstitious Ritu-

**Table 3.**

Summary of Regression Results with Central Epistemological Beliefs Factors and General Metacognitive Awareness Entered for Full Model Explaining Locus of Control

Independent Variables	B	SE b	B	Partial	t	p
Belief in Science as a Source of Knowledge	-.056	.068	-.073	-.065	-.818	.414
Belief in a Rational Society	-.004	.101	-.004	-.004	-.044	.965
Belief in Superstitious Rituals	.294	.074	.297	.301	3.98	.000
Belief in Supernatural Powers	.240	.090	.202	.207	2.67	.008
General Metacognitive Awareness	-.010	.011	-.069	-.073	-.918	.360

F = 6.72    Multiple R = .42  
df= 5/159    R Square = 17%  
p = .000    Adj. R Square = 15%

als and Belief in Supernatural Powers on Locus of Control is presented in Table 4.

Model1, which includes only Belief in Superstitious Rituals scores, is accounted for 10% of the variance. The inclusion of Belief in Supernatural Powers into Model 2 resulted in additional 15% of the variance being explained. Collectively, Belief in Superstitious Rituals and Belief in Supernatural Powers explain approximately 16% of the variance in Locus of Control scores ( $F(2-180)=15.806, p<.001$ ).

### Discussion

The purpose of this study is to examine early childhood teacher candidates' locus of control, epistemological beliefs and metacognitive awareness. The participants' mean score for the Locus of Control Scale was 11.70. In his adaptation study of the Locus of Control Scale, Dag (1991) has reported that the mean for the whole sample as 10.07 ( $n=532; Sd=4.05$ ), whereby the female students had a higher mean ( $\bar{x}=10.66$ ) than male students ( $\bar{x}= 9.83$ ). In another comparable study, Terzi et al. (2012) have found that female students have significantly higher scores of locus of control ( $\bar{x}=11.76$ ) than male students ( $\bar{x}=10.23$ ). Considering that the vast majority (91%) of the participants of this study consists of female students, it is pos-

sible to conclude that the mean score for the Locus of Control Scale is very close to those of aforementioned research findings. Examination of central epistemological beliefs scores in comparison to the normative means reported in the study by Oksal et al. (2006) has indicated that the participants have higher scores on belief in science as source of knowledge, belief in a rational society, and belief in supernatural powers whereas they scored lower on belief in superstitious rituals. This finding indicates that the participants had fairly stronger beliefs in science as a source of knowledge and in rational society but also in supernatural powers. Having strong belief in supernatural powers and a tendency not to believe in superstitious rituals may seem contradictory, but it has been emphasized that epistemological beliefs may not be synchronous (Oksal et al.; Schommer, 1994). In this study, the participants have displayed high levels of metacognitive awareness ( $\bar{x}= 192.83$ ). In Ozsoy and Gunindi's (2011) study whose sample consists of early childhood preservice teachers, very similar findings have been reported ( $\bar{x}=192.68$ ).

The second part of the findings has presented relationships between research variables. The result of data analysis has pointed out that as external locus of control increases, beliefs in superstitious rituals and beliefs in supernatural powers also increase.

**Table 4.**

Summary of Stepwise Regression Results with Belief in Superstitious Rituals and Belief in Supernatural Powers Factors Entered for Final Model Explaining Locus of Control

Model	Independent Variables	B	SE B	$\beta$	T	P	R	R <sup>2</sup>	F	p
1	Constant	7.618	.960	--	7.940	.000	.314	.099	19.863	.000
	Belief in Superstitious Rituals	.315	.071	3.14	4.457	.000				
2	Constant	3.889	1.475	--	2.636	.009	.387	.149	15.806	.000
	Belief in Superstitious Rituals	.271	.070	2.71	3.869	.000				
	Belief in Supernatural Powers	.282	.086	.229	3.269	.001				

Given that the Locus of Control Scale is interpreted in the direction of externality, with higher scores indicating greater externality orientation; the result pointing out that individuals, who consider the outcomes of events beyond their control, also tend to believe more in superstitious rituals and supernatural powers seems reasonable. In addition, this finding is somewhat consistent with the previous research which has examined the relationship of epistemological beliefs to locus of control. In Yilmaz and Kaya's (2010) study, in which Schommer's Epistemological Beliefs scale was used, internal locus of control has been found to be related to the more sophisticated levels of epistemological beliefs. Examination of the correlation between locus of control and metacognitive awareness has shown that the locus of control is weakly but significantly related to general metacognitive awareness and to its evaluation subfactor. In other words, as externality orientation increases, general metacognitive awareness and the evaluation aspect of cognitive strategies decrease to some extent. Landine and Stewart (1998) have reported no significant correlation between metacognition and locus of control, whereas Scarborough (1986) has found a negative correlation between locus of control and metacognition. In retrospect, current research findings are not quite consistent and more research is needed to enlighten the possible link between locus of control and metacognitive awareness, along with its sub-dimensions. In terms of the relationship between metacognition and epistemological beliefs, belief in science as a source of knowledge and belief in a rational society dimensions have been significantly related to the general metacognitive awareness scores and to the most of the metacognitive awareness subdimensions. In previous research, parallel findings have been reported. Bromme et al. (2010) have found that more sophisticated epistemological beliefs are related to higher levels of metacognition. Belet and Guven's (2011) research data have indicated a low but significant relationship between the use of metacognitive strategies and epistemological beliefs in preservice teachers. In addition to empirical studies documenting the relationship between metacognition and epistemological beliefs, some theoretical models emphasize the link between these two constructs (Bromme et al., 2010; Hofer, 2004). For example, Kuhn (2000) considers epistemological understanding as a function of metacognition, both developing over time, and further explains that epistemological understanding itself is metacognitive because it relies on using higher level cognitive processes to constitute an implicit theory explaining the how things are known.

Regression analyses have suggested that belief

in superstitious rituals and belief in supernatural powers are significant predictors of locus of control. While belief in superstitious rituals has a greater impact; these two independent variables explain approximately 16% of the variance in locus of control scores of the participants. Therefore, at least for the sample of this study, having strong beliefs especially in superstitious rituals seems to be a significant contributing factor for engaging in perception that outcomes of the events are beyond personal control.

This study has some implications for early childhood education and teacher education: Studies reveal that personality traits (Hawkes, 1991; TatalovićVorkapić, 2012), epistemological beliefs and metacognitive awareness emerge early in life (Berk, 2011; Kuhn, 2000). From age 4 on, young children are aware that both beliefs and desires can influence behavior (Berk, 2011; Kuhn). Because early childhood teachers are among the most significant adults in their students' lives, they have a highly effective role as models for acquisition of fundamental personality orientations and beliefs. In consequence, teachers should be aware of what kind of explicit or implicit messages they convey to children in terms of reflecting on own or others' thoughts, where to seek for knowledge and whether believing or not that individual have control over the results of events through personal effort. In teacher education, it must be emphasized that the learning context of the classroom is largely influenced by early childhood educator's personality traits and beliefs (Hawkes; TatalovićVorkapić). Guiding student teachers to identify their personality characteristics and beliefs within teacher education programs would lead to more reflective and informed practices for education. To promote more sophisticated epistemological beliefs, using some intervention programs which include discussion and modeling seems to be a promising approach (Schraw, 2001; Stacey et al., 2005). Although there is no clear consensus regarding the role of the teacher and the best instructional method in improving metacognitive skills, some authors emphasize the importance of relevant interventions (Jager, Jansen, & Reezigt, 2005). Explicit teaching of metacognition through some instructional practices that encourage reflection on learning processes and use of metacognitive strategies is considered a beneficial approach for the development of metacognition in students (Hartman, 2001; Schraw, 1998). Therefore, based on these findings, teacher education programs should include some intervention approaches which encompass role modeling, encouragement of discussion and reflection, as well as identifying and using metacognitive knowledge and strategies. It is also

important for teachers and teacher candidates to follow the related literature to inform their practices. Furthermore, the expected benefit of these efforts is that identifying the nature and function of important variables that influence learning through collaboration between academics and practitioners would lead to better learning outcomes.

There are two issues that future studies need to address: The first is conducting longitudinal studies to see how these variables change or develop from the beginning of undergraduate education to the end of it. The second is to explore if raising self-awareness in students (e.g. by using some intervention programs) with regard to their locus of control orientations, epistemological beliefs and metacognitive awareness makes any difference in their confidence in putting some effort for changing the outcomes of events, perceptions of knowledge, or monitoring and regulating their cognitive activities.

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