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Investigation of Primary School Students' Metacognitive Awareness and Decision-Making Skill

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Abstract

The purpose of this study is to determine the third and fourth grade primary school students' metacognitive awareness and perception of their decision-making skill and the relationship between them. The study employed the relational survey model. The population of the study is comprised of the third and fourth grade primary school students attending at the state schools in the Marmaris province of the city of Muğla. The sample was randomly determined and included 143 students. As the data collection tools, "The Teacher Form to Determine Primary School Students' Metacognitive Awareness" and "The Scale of Third and Fourth Grade Primary School Students' Perception of Decision-Making Skill" were used. The findings have revealed that the primary school students' metacognitive awareness and perception of their decision-making skill are high. It was concluded that the third and fourth grade primary school students' metacognitive awareness and perception of decision-making skill do not differ significantly in terms of the gender and grade level variables. Moreover, a positive and weak correlation was found between the students' metacognitive awareness and perception of decision-making skill and their metacognitive perception was found to predict their perception of decision-making skill. It can be argued that during the primary education, when teachers get students engaged in activities to develop their metacognitive awareness, their decision-making skill can also be developed.

Key Words: Metacognitive Awareness, Decision-Making, Primary School, Perception

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INTRODUCTION

The aim of our education system is to develop cognitive skills such as increasing the capacity of thinking, decision making and problem solving to enable individuals to cope with the problems they may encounter in daily life. When cognitive skills are examined, it is seen that skills such as asking questions, critical thinking, problem solving, analyzing, synthesizing, evaluating and decision making are expressed as higher order cognitive skills. In the curriculum, it is seen that metacognitive skills are directed, meaningful and permanent learning is provided and old and new knowledge is integrated around skills and competences (MEB, 2018). John Hurley Flavell (1979) is the first researcher to introduce the concept of metacognitive knowledge into the literature. The concept of metacognition was first defined by Flavell (1976) as "metamemory" and later as "metacognition" in 1979. Flavell's research interests from the outset have focused on developmental psychology, and in particular on children's thinking of their own thinking processes. Flavell's work on children's thinking about their own thinking processes has been greatly influenced by Jean Piaget's work, which is of great importance in developmental psychology (Van Velzen, 2016).

Although there has been research about the concept of metacognition in the world since the 1980s (Flavell, 1979; Garner 1987; Mazzoni and Nelson, 1998; Baker, 2002), research on the concept of metacognition started in Turkey in the 1990s (Erden and Akman, 1996; Senemoğlu, 2004) and different names have been used for this concept as no consensus has been reached on a common name in the literature. Thus, for the translation of the concept of "metacognition" into Turkish, different names have been offered such as "biliş ötesi" (Açıkgöz, 1996; Boyacı, 2010; Namlu, 2004), "yürütücü biliş" (Çalışkan, 2010), "metakognif bilgi" (Aral, 1999), "bilişsel farkındalık" (Balcı, 2007; Doğanay, 1997; Öztürk, 2009; Gelen, 2003), "bilişüstü farkındalık" (Demirsöz, 2010), "bilişüstü" (Duru, 2007; Olgun, 2006; Özcan, 2007), "biliş ötesi farkındalık" (Akın, 2006; Demirel and Turan, 2010), "üstbiliş" (Bozan, 2008; Çakıroğlu, 2007), "üstbiliş farkındalık" (Özkan and Bümen, 2014). Because the concept of metacognition is abstract and complex, many terms such as self-regulation, executive control are used in defining the same basic phenomenon, and some terms are used interchangeably, different definitions have been made and different strategies and models have emerged. Since the concepts of cognition and metacognition are widely used and these concepts are abstract, it is important to explain the difference between these two concepts. According to Flavell (1979), while cognition refers to the state of learning and understanding the outside world, metacognition refers to the process of engagement with higher thinking about how to understand and how to create a better learning experience. While Garner and Alexander (1989) defined cognition as a concept that encompasses cognitive processes such as remembering and understanding, they defined metacognition as the individual's self-evaluation through reflecting on cognitive processes such as self-perception and self-knowledge.

Metacognition is defined as a means of expressing the individual's cognitive operations and outcomes and his / her knowledge about anything related to them, and it is stated that this concept plays an important role in different areas such as reading comprehension, language learning, memory, reasoning, problem solving, communication, persuasion and self-control. In addition, an individual with cognitive awareness and metacognitive skills uses this process to plan and observe ongoing cognitive activities (Flavel, 1979).

Another person playing an important role in understanding metacognitive knowledge is Ann Leslie Brown (1987). Brown, an educational psychologist, was interested in how students could become better learners, and worked on learning of children by using study techniques such as summarizing, questioning, and explaining an idea. Both Flavell and Brown's theories have shown that metacognitive knowledge consists of awareness and understanding that can help a student learn effectively (Van Velzen, 2016). According to Brown (1987), an individual with metacognitive awareness should be responsible for organizing and managing the learning processes and aware of what he / she knows. In this context, the concept of metacognition is generally expressed as the individual's being aware of and directing his/her own thinking processes (Sarı, 2015). When the definitions in the literature are examined, it is seen that although there are differences in some parts of

the definitions, the common point is to control the thinking processes by being aware of mental processes. As a result, with metacognition, skills such as self-awareness, planning, self-control, self-regulation and self-evaluation can be expected to emerge in the individual (Doğanay, 1997; cited in Akın and Çeçen, 2014).

According to Flavell (1979), the development of metacognition begins when individuals are aware of what their strengths and weaknesses are in their own mental processes and of their own knowledge. Metacognition generally begins to develop with the age of children as metacognitive knowledge from the age of 3-5 years (Flavell, 1979; Karakelle and Saraç, 2007; Schneider and Lockl, 2002). Afterwards, regulatory skills such as experiences and targets emerge at the age of 8-10 and continue throughout life (Kuhn, 2000; Zimmerman, 1990). In short, metacognitive awareness develops with age and it is positively correlated with mental development (Schneider and Lockl, 2002). Therefore, it is stated that it is necessary to give importance to metacognitive awareness in order to help a child to understand any subject and to acquire cognitive skills, and to impart these skills to children at early ages (Baba Öztürk and Güral, 2016; Siswati and Corebima, 2017).

Senemoğlu (2004) defines the concept of metacognition as a process of asking and answering questions such as how much information I have about any subject, how long it can take for me to learn this subject, which way I should follow to learn effectively, how I should find and correct my mistake when I have committed a mistake and how I should readjust a plan when it is not suitable. While answering such questions, the individual is also using his/her decision-making skill. While Eldeleklioğlu (1996) states that decision-making is a cognitive process like doing research, solving problem and learning about options and it develops with age, Sağır (2006) states that decision-making is the collection of information and creation of options through reasoning and it is selection of the most appropriate option to achieve the desired result for any situation encountered. Moreover, when the definitions proposed for the concept of thinking are examined, it is seen that it includes everything visualized in the mind in general and it is a concept covering all the mental processes related to critical thinking, reflective thinking, problem solving and decision-making (Eryaman, 2007; Sever and Ersoy, 2019). Thus, it is seen that there are many processes including metacognitive awareness and decision-making involved in the thinking process. The decision-making process is comprised of different elements such as defining the problem in the face of any incidence or trouble, creating options for the defined problem, selecting the best option among all the options created, making decisions on the basis of the plans made, implementing the decision and evaluating the outcome (Mitchel and Krumboltz, 1984, cited in Güçray, 2001). What directs from one situation to another in the decision-making process is mental models and thus decision-making processes should be analysed on the basis of these models (Betancur, 2016, cited in Melgar Begazo et al., 2019). Therefore, it can be argued that in order for an individual to make decisions in the face of any event, he/she should use his/her cognitive awareness by judging the problem situation and making use of the cognitive process. In addition, Eldeklioğlu (1996) and Köksal (2003) stated that the decision-making process is a cognitive process. In this regard, it can be contended that there is a relationship between decision-making skill and metacognitive awareness. Thus, it is important to determine metacognitive awareness of primary school children as their metacognitive awareness starts to develop from the age of 8-10. Moreover, determination of whether there is a relationship between metacognitive awareness and perception of decision-making skill is important in terms of determining the measures to be taken in the process of developing the decision-making skill. In this regard, the purpose of the current study is to determine primary school students' metacognitive awareness and perception of their decision-making skill. In this connection, answers to the following questions were sought.

1. What is primary school students' level of metacognitive awareness and their perception of decision-making skill?

2. Do primary school students' metacognitive awareness and decision making skill differ significantly regarding gender and grade level?

3. Does primary school students' metacognitive awareness predict their decision-making skill?

METHOD

The current study conducted to determine the extent to which students' metacognitive awareness predicts their decision-making skill employed the relational survey model. The relational survey-model aims to reveal the exchange occurring between two or more variables and the degree of this exchange (Karasar, 2010).

Population and Sample

The population of the present study is comprised of third and fourth grade primary school students in the Marmaris province of the city of Muğla in the spring term of the 2018-2019 school year. The sample of the study is 143 third and fourth-grade primary school students selected among the population on a volunteer basis. Information about the gender, grade level and academic achievement of the participating primary school students is given in Table 1.

Table 1. The distribution of the participating primary school students across genders, grade levels and academic achievements

Variables		n	%
Gender	Female	79	55.2
	Male	64	44.8
Grade Level	3rd grade	50	35.0
	4th grade	93	65.0
Academic Achievement	Passing	5	3.5
	Moderate	14	9.8
	Good	48	33.6
	Very Good	76	53.1

As can be seen in Table 1, 79 of the participants are females (55.4%) and 64 of them are males (44.8%); 50 of them are third grade students (35%) and 93 are fourth grade students (65%). The majority of the students were found to be academically very good (53.1%).

Data Collection Tools

In order to collect data in this study, *The Metacognitive Awareness Scale Teacher Form* developed by Esmer and Yorulmaz (2017) and *The Scale of Primary School Third and Fourth Grade Students' Perception of Decision-Making Skill* developed by Demirbaş Nemli (2018) were used. In the data collection tools, there are also some items to elicit data about the participants' gender, grade level and academic achievement.

Metacognitive Awareness Scale Teachers Form

"The Metacognitive Awareness Scale Teacher Form" was developed by Esmer and Yorulmaz (2017) to determine primary school students' metacognitive awareness on the basis of teacher observations. This measurement tool is the adaptation of "The Metacognitive Awareness Scale for Children (Form A)" developed by Sperling et al., (2002) and adapted to Turkish by Karakelle and Saraç (2007) for teachers. The measurement tool consisted of a single dimension and 12 items and it was designed in the form of a three-point Likert scale. In the original form, the internal consistency of the scale was found to be .94, while in the current study it was found to be .87.

Scale of Primary School Third and Fourth Grade Students' Perception of Decision-Making Skill

"The Scale of Primary School Third and Fourth Grade Students' Perception of Decision-Making Skill" was developed by Demirbaş Nemli (2018) to determine primary school students' perception of their decision-making skill. The scale was designed in the form of a four-point Likert scale and consisted of 17 items. Of these 17 items, 8 have negative statements while 9 have positive statements. This scale consists of five sub-dimensions called "feeling, restricting and defining the problem", "collecting information", "producing alternative solution options", "making decision", and "implementing and evaluating the decision". For the whole scale, the Cronbach Alpha value was calculated to be .78 while in the current study it was found to be .81.

Data Collection and Analysis

After the required permissions were granted to collect data, the data were collected from 143 primary school 3rd and 4th grade students in the Marmaris province of the city of Muğla in February, 2019. Only voluntary and willing students were involved in the study. The cognitive awareness scale teacher form, one of the scales in the data collection tool, was completed by the teachers of the students while the other scale was completed by the students.

In the analysis process of the collected data, first reliability coefficients of the scales were calculated. Then, arithmetic means and standard deviations of the scores taken from the scales were calculated. In order to determine whether the scores taken from the scales showed a normal distribution, skewness and Kurtosis values were checked. When the skewness and Kurtosis values are between +1.500 and -1.500, then it means the distribution is normal. In the current study, the skewness value for the scores taken from the metacognitive awareness scale teacher form was found to be -1.169, while the Kurtosis value was found to be 1.279; the skewness value for the scores taken from the perception of decision-making skill was found to be -.524, while the Kurtosis value was found to be .039. These skewness and Kurtosis values show; according to Tabachnick and Fidell (2013), that the distribution is normal. Thus, descriptive analyses were used to determine the primary school 3rd and 4th grade students' metacognitive awareness and decision-making skill. If a score taken from the Metacognitive Awareness Scale Teacher Form is in the range of 1.00-1.67, then it is considered to be "low", 1.68-2.33 "medium" and 2.34-3.00 "high". If a score taken from the Scale of Primary School Third and Fourth Grade Students' Perception of Decision-Making Skill is in the range of 1.00-2.00, then it is considered to be "low", 2.01-3.00 "medium" and 3.01-4.00 "high". One of the parametric tests; t-test, was used to determine whether the participants' metacognitive awareness and decision-making skill differ significantly regarding gender and grade level. Moreover, regression analysis was conducted to determine whether metacognitive awareness predicts decision-making skill. Findings related to the results of the analyses are given below.

FINDINGS

In line with the purpose of the current study, the results of the analyses conducted to find answers to the sub-problems are presented in tables and then interpreted.

Findings related to the primary school students' levels of cognitive awareness and decision-making skill are presented in Tables 2 and 3.

Table 2. Descriptive statistics related to the primary school students' metacognitive awareness and decision-making skill

	N	$\overline{X}$	Ss	Level
Metacognitive awareness	203	2.69	.30	High
Decision-making skill	203	3.30	.45	High

As it can be seen in Table 2, the primary school 3rd and 4th grade students' mean of the metacognitive awareness scores is ($\bar{x}$) 2.69 and that of the decision-making skill is ($\bar{x}$) 3.30. On the basis of the mean scores of the students, it was concluded that their levels of both metacognitive awareness and decision-making skill are high.

Table 3. Distribution of the primary school students' levels of metacognitive awareness and decision-making skill

	N	Low	Medium	High
Metacognitive awareness	203	1	21	121
Decision-making skill	203	1	38	104

As it can be seen in Table 3, the metacognitive awareness level of 1 student is "low", that of 21 students is "medium" and that of 121 students is "high" while the level of the decision-making skill of 1 student is "low", that of 38 students is "medium" and that of 104 students is "high". Thus, it can be argued that the students have developed cognitive awareness and decision-making skill.

Results obtained from t-test conducted to determine whether the students' cognitive awareness and decision making skill mean scores differ significantly by gender are given in Table 4.

Table 4. Results of the independent samples t-test conducted to determine whether the primary school students' metacognitive awareness and decision-making skill mean scores differ significantly depending on gender

	Groups	N	$\bar{X}$	Ss	sd	t	p
Metacognitive awareness	Females	79	2.71	.27	141	1.20	.23
	Males	64	2.65	.33			
Decision-making skill	Females	79	3.35	.42	141	1.57	.11
	Males	64	3.23	.47			

As can be seen in Table 4, the primary school students' metacognitive awareness and decision-making skill do not differ significantly depending on gender (t= 1.20; p<.05, t= 1.57; p<.05). Thus, it can be argued that the gender variable does not have a significant effect on metacognitive awareness and decision-making skill. On the other hand, the female students' metacognitive awareness and decision-making skill mean scores are higher than those of the male students.

Results obtained from t-test conducted to determine whether the primary school students' cognitive awareness and decision making skill mean scores differ significantly by grade level are given in Table 5.

Table 5. Results of the independent samples t-test conducted to determine whether the primary school students' metacognitive awareness and decision-making skill mean scores differ significantly depending on grade level

	Groups	N	$\bar{X}$	Ss	sd	t	p
Metacognitive awareness	3rd grade	50	3.24	.45	141	-1.07	.28
	4th grade	93	3.33	.44			
Decision-making skill	3rd grade	50	2.63	.32	141	-1.60	.11
	4th grade	93	2.71	.28			

As can be seen in Table 5, the primary school students' metacognitive awareness and decision-making skill do not differ significantly depending on grade level (t= -1.07; p<.05, t= -1.60; p<.05). Thus, it can be argued that the grade level variable does not have a significant effect on metacognitive awareness and decision-making skill. On the other hand, the fourth grade students' metacognitive awareness and decision-making skill mean scores are higher than those of the third grade students.

Results of the Pearson Correlation analysis conducted to determine the correlation between the primary school students' metacognitive awareness and decision-making skill mean scores are given in Table 6.

Table 6. Results of the Pearson Correlation Coefficient conducted to test the correlation between primary school students' cognitive awareness and decision-making skill mean scores

Variables	Metacognitive awareness	Decision-making skill
Metacognitive awareness	-	.27**
Decision-making skill		-

n=203, **p<.01

As can be seen in Table 6, there is a significant correlation between the primary school students' metacognitive awareness and decision-making skill (r=.27, p<.01). This significant correlation is positive and weak. Thus, it can be argued that primary school students' increasing metacognitive awareness will lead to development in their decision-making skill.

Results of the regression analysis conducted to determine whether the primary school students' metacognitive awareness predicts their decision-making skill are given in Table 7.

Table 7. The extent to which the primary school students' metacognitive awareness predicts their decision-making skill

	R	R^2	F	B	Sd	Beta	t	p
Perception of decision-making skill	.27	.07	11.60	.18	.05	.27	11.52	.00*

As can be seen in Table 7, as a result of the simple linear regression analysis conducted to determine whether the primary school students' metacognitive awareness predicts their decision-making skill, a significant correlation was found between metacognitive awareness and decision-making skill (R= .27, R^2= .07). Thus, it was concluded that the students' metacognitive awareness is a significant predictor of their decision-making skill ($F_{(1-203)}$= 11.60, p<.05). The students' metacognitive awareness was found to explain 7% of the variance in their decision-making skill. Significance test of the main predictor variable coefficient of the regression equation (B= .18) has revealed that the students' metacognitive awareness is a significant predictor of their decision-making skill (p< .01).

RESULTS, DISCUSSION AND SUGGESTIONS

As a result of the analysis conducted to determine the primary school students' metacognitive awareness, it was found that the primary school 3rd and 4th grade students' metacognitive awareness is high ($\bar{x}$ = 2.69). In light of this finding, it can be said that the primary school 3rd and 4th grade students are good at getting to know themselves, controlling and directing their mental processes and determining strategies suitable for the situation in which they are. It can also be argued that high metacognitive awareness of the primary school students contributes to their academic achievement (Gül and Shehzad, 2012; Coutinho, 2007; Young and Fry, 2008; Landine and Steward, 1998; Uğraş, 2018), social experiences and life skills. This finding is similar to the findings reported by Adıgüzel and Orhan (2017), Batdal Karaduman and Erbaş (2017), Dilci and Kaya (2012), Akkaya and Sezgin Memnun (2012), Özsoy and Günindi (2011) and Baykara (2011). However, this finding is different from the findings reported by Özsoy, Çakıroğlu, Kuruyer and Özsoy (2010), Baysal, Ayvaz, Çekirdekçi and Malbeleği (2013). It was also found in the current study that the decision-making scores of the primary school third and fourth grade students are high ($\bar{x}$ = 3.30). Thus, it can be said that the primary school third and fourth grade students are good at creating options for any given situation and determining the most suitable option. This finding is similar to the finding reported by Eldeleklioğlu (2016), who conducted a study with the participation of university students to determine the relationship between mother-father attitude and decision-making strategies.

The primary school third and fourth grade students' metacognitive awareness scores were found to be not differing significantly depending on gender (p>.05). When the primary school students' metacognitive awareness scores were examined in relation to the gender variable, the mean score of the female students ($\overline{x}$ = 2.71) was found to be higher than that of the male students ($\overline{x}$ = 2.65), yet this difference is not significant. Thus, it can be argued that the gender variable is not a significant variable affecting the development of metacognitive awareness in third and fourth grade students. This result concurs with the findings reported by Hashempour, Ghonsooly and Ghanizadeh (2015), Jaleel (2016), Özsoy, Çakıroğlu, Kuruyer and Özsoy (2010), Vianty (2007). However, this result is not parallel to the results found by Veloo, Rani and Hariharan (2015), Gürefe (2015), Koç and Karabağ (2013), Atay (2014), Tüysüz (2013), Kaya and Fırat (2011), Logan and Johnston (2009). It was also found that the primary school students' decision-making skill scores do not differ significantly depending on gender (p>.05). When the primary school students' decision-making scores were examined in relation to gender, the mean score of the female students ($\overline{x}$ = 3.35) was found to be higher than that of the male students ($\overline{x}$ = 3.23) yet this difference is not significant. Thus, it can be argued that the gender variable is not a significant variable affecting the development of the primary school third and fourth grade students' decision-making skill. When the relevant literature is reviewed, it is seen that different findings have been reported by different studies. The finding obtained by Çakmakçı (2009) is similar to this finding of the current study. On the other hand, in a study conducted by Tekin and Ulaş (2016) to evaluate primary school students' decision-making skill, a significant difference was found only in the independent decision-making skill in favour of the female students.

The primary school third and fourth grade students' metacognitive awareness scores were found to be not differing significantly depending on grade level (p>.05). When the primary school students' metacognitive awareness scores were examined in relation to their grade level, the mean score of the fourth grade students ($\overline{x}$ = 3.33) was found to be higher than that of the third grade students ($\overline{x}$ = 3.24) yet this difference is not significant. The reason behind the higher mean score of the primary school fourth grade students than that of the third grade students might be the cognitive development and educational process. This finding is similar to the findings reported by Özsoy, Çakıroğlu, Kuruyer and Özsoy (2010), Tunca and Alkın Şahin (2014), Kaçar and Sarıçam (2015), Batdal Karaduman and Erbaş (2017). However, it contradicts with the findings reported by Ancak Özsoy and Günindi (2011), Koç and Karabağ (2013), Sezgin Memduh and Akkaya (2009), who found that the students' metacognitive awareness scores differ significantly depending on grade level. The primary school students' decision-making skill scores were found to be not differing significantly depending on grade level (p>.05). When the primary school students' decision-making skill mean scores were examined in relation to grade level, the mean score of the fourth grade students ($\overline{x}$ = 2.71) was found to be higher than that of the male students ($\overline{x}$ = 2.63) yet this difference is not significant. The reason behind the higher mean score of the fourth grade students might be because of the longer education they have received. In the literature, there is no study comparing the metacognitive awareness and decision-making skill of students from different grade levels of primary education but in a study conducted by Kesici (2002), Sinangil (1993) and Tiryaki (1997) on university students, it was found that with increasing grade level, more logical and effective strategies are used in decision-making. This does not support the finding of the current study. On the other hand, in a study conducted by Yiğit (2005) with high school students, it was found that grade level does not lead to a significant difference in the decision-making strategies used by the students, which supports the finding of the current study. The difference seen between the findings of different studies in the literature might be because of the effects of age and other developmental characteristics of the students.

In the current study, a significant correlation was found between the primary school third and fourth grade students' cognitive awareness and decision-making skill (r=.27, p<.01). This correlation found between cognitive awareness and decision-making skill is weak. In light of this finding, it can be argued that developing primary school students' metacognitive awareness leads to development of their decision-making skill. Another finding of the current study is that the primary school third and fourth grade students' metacognitive awareness is a significant predictor of decision-making skill.

Dawson (2008) states that decision-making skill is among metacognitive awareness strategies and argues that enhancing metacognitive awareness will foster decision-making skill. Moreover, Brewer (2015) and Tachie (2019) found a correlation between metacognitive awareness and decision-making skill. It was also stated by Knox (2017), Joseph (2010), Schraw and Graham (1997) that students with more developed metacognitive awareness can make better decisions and have more developed thinking skills about problem solving. In light of all these findings, the following suggestions can be made:

- Students should be provided with opportunities to be engaged in activities to foster metacognitive awareness through the use of different methods and techniques by primary school teachers.

- Pre-service and in-service trainings should be organized to inform primary school teachers about the subjects related to metacognitive awareness and decision-making and such information should also be incorporated into their undergraduate training.

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