

# The Determinants of Life Satisfaction Among Adolescents: The Role of Metacognitive Awareness and Self-Efficacy

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**Abstract** This study investigated the associations among the life satisfaction, metacognitive awareness and perceived self-efficacy. It also investigated whether life satisfaction, metacognitive awareness and perceived self-efficacy vary according to gender. The study was performed with 492 students attending high schools. The Life Satisfaction Scale, Cognitive Awareness Scale, Self-Efficacy Scale and an Individual Data Form were used for data collection. Pearson correlation coefficient results revealed that life satisfaction was significantly positively correlated with metacognitive awareness ( $r = .36, p < .001$ ) and self-efficacy ( $r = .28, p < .001$ ). Multiple regression analysis revealed that metacognitive awareness and self-efficacy accounted for 15 % of life satisfaction ( $F_{(2,489)} = 45.25, p < .001$ ). Metacognitive awareness ( $\beta = .29, p < .001$ ) and self-efficacy ( $\beta = .16, p < .001$ ) make a significant original contribution to the model. In addition, the results show that adolescents do not vary according to life satisfaction ( $F = .10, p = .74, \eta^2 = .00$ ), metacognitive awareness ( $F = .01, p = .91, \eta^2 = .00$ ) or self-efficacy ( $F = 2.21, p = .13, \eta^2 = .00$ ). The study results show that metacognitive awareness and self-efficacy are significant predictors of life satisfaction in adolescents.

**Keywords** Life satisfaction · Metacognitive awareness · Self-efficacy · Adolescents

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## 1 Introduction

In our day, determiners and indicators of life satisfaction of people are assessed within a very broad context. Apart from psychopathology-oriented studies, the studies investigating cognitive and social determiners of life satisfaction started to accelerate. In this manner, it is very important for people to use their cognitive skills efficiently and transform these skills into performance within the social construct in order to ensure life satisfaction. As a matter of fact, it is reported that people being more successful in cognitive interventions are able to use their metacognitive skills in an efficient way (Garner and Alexander 1989). The fact that people succeed or overcome a problem through metacognitive skills in cases requiring the cognitive performance in their lives stimulates their senses of hope, self-confidence and happiness and improves life satisfaction (Lobban et al. 2002). Self-efficacy of people being frequently successful in both cognitive and performance-based activities is positively affected by this process (Lent et al. 1984; Schunk 1984). Positively developing self-efficacy perceptions are reported to affect success levels of people (Pajares 1996a, b). In line with the findings obtained from research, it can be inferred that people having high level of metacognitive awareness rely on their own skills and talents more (Coutinho and Neuman 2008; Kleitman and Gibson 2011).

According to the social cognitive theory, it can be seen that self-efficacy perceptions of people who are able to control their own cognitive processes are affected by various levels (Junge and Dretzke 1995; Pajares 1996a, b; Schack 1989). It is reported that people who functionalize their metacognitive skills can use their self-efficacy perceptions and reorganize their cognitive competency and thus they can conduct any changes in their learning experiences and behaviors. Taking stand from this point of view, it is stipulated that people having strong perceptions about their own efficacy can determine more suitable conditions for themselves (Bandura et al. 1996). Life satisfaction which is defined as a general satisfaction for the whole life (Diener and Diener 1996) is interpreted as one of the consequences of emotional reactions affected by self-efficacy perceptions (Gilman and Huebner 2003). Having a unique position among psychological well-being theories, life satisfaction is generally defined as a conscious cognitive judgment period conducted by person in order to assess his/her life according to his/her own standards (Pavot and Diener 1993).

### 1.1 Metacognitive Awareness

The concept of metacognitive awareness, the foundation of which was laid in Hart's (1965) studies regarding feelings of knowing, and whose conceptual infrastructure is based on cognitive psychology, is a significant component of advanced mental performance and effective learning. Individuals' cognitive processes and outputs or self-knowledge express metacognition. With the help of metacognitive processes enabling them to monitor and adjust their own cognitive performances, adolescents are able to shape their own learning more effectively (Schraw and Graham 1997). The concept of metacognition is also associated with individuals' feelings and thoughts concerning cognitive processes and conditions. In addition to the self-regulation cognitive process that individuals employ in the light of their own objectives, the concept of metacognition widely refers to what individuals know about their own cognitions (Koriat 2004).

### 1.2 Components of Metacognition

Detailed examination of definitions of metacognition reveals unanimity on its basic elements. According to that shared view, metacognition is defined as metacognitive knowledge and metacognitive regulation.

### 1.2.1 Metacognitive Knowledge

Metacognitive knowledge is knowledge that individuals possess about their own cognitions or about cognition as a general concept (Butler and Winne 1995; Schraw 1998). Metacognitive knowledge comprises three different building blocks of metacognitive awareness; declarative knowledge, procedural knowledge and conditional knowledge (Schraw 2009). While the individual's knowledge of his/her cognitive efficacies is defined as declarative knowledge (Schraw 1998), procedural knowledge is a form of knowledge referring to how various conditions, including the individuals' cognitive tasks, can be fulfilled (Carrell et al. 1998; Schraw et al. 2006). Conditional knowledge is defined as a form of knowledge permitting declarative knowledge to become functional in order to benefit from cognitive procedures (skills) (Schraw and Moshman 1995).

### 1.2.2 Metacognitive Regulation

Metacognitive regulation involves a series of cognitive actions that help students to learn about and control themselves. In addition to more effective use of existing strategies, and sources of interest and attention, it also permits individuals to be more aware of deficiencies in their own cognitive processes (Schraw 1998). Regulation of cognition involves various dynamic processes that permit individuals to act on the knowledge they possess. These are *planning*, *monitoring* and *evaluation* (Jacobs and Paris 1987). Planning involves the selection of appropriate strategies for a specific situation and the effective use of resources. Actions such as the individual placing tasks in a particular order, selective use of time and activating prior knowledge are among the components of the process (Schraw et al. 2006). In its barest form, monitoring may be described as the individual's awareness of his own behavior and success regarding any task (Schraw and Moshman 1995). Metacognitive monitoring prepares an environment for the individual to develop perceptions in the light of the requirements of the task undertaken by evaluating the effectiveness of the cognitive strategies he uses, to select and apply appropriate cognitive strategies and to evaluate task success (Ross et al. 2006). The final element considered in the scope of cognitive regulation is evaluation. This is the attentive examination of the individual's learning outputs and cognitive regulation processes. Revision of the individual's aims and estimates and concretization of mental gains are included within the scope of metacognitive evaluation. Metacognitive regulation skills such as metacognitive knowledge and planning are associated with the evaluation process (Schraw and Moshman 1995; Schraw et al. 2006).

## 1.3 Self-Efficacy

According to the social cognitive theory that constitutes the conceptual infrastructure of self-efficacy, if individuals do not believe that they can attain the desired results with the help of their own behavior they are less willing to convert these behaviors into performance. To put it another way, perceptions regarding the possibility of a behavior being performed may motivate individuals to repeat behavior (Bandura et al. 1996). Bandura (1986) stated that individuals possess a 'self system' that enables them control and regulate their own feelings, thoughts and behaviors. This self system harbors the individual's cognitive and emotional structures and involves such skills as symbolizing, learning through models, developing alternative strategies, regulating behaviors and self-judgment (Pajares 1996a, b). Self-efficacy occupies a more central place among the views proposed

on the subject of individual efficacy (Bandura 1989). Self-efficacy represents individuals' beliefs regarding their own abilities to raise their learning experiences and the behavior they exhibit to appropriate levels. Self-efficacy is the individual knowing what he/she can do, rather than what he/she will do. In other words, it means to be able to convert performance into behavior by assessing one's own abilities and sufficiencies (Bandura 2001).

#### 1.4 Life Satisfaction

Many researchers throughout the course of history have investigated the processes that make human life meaningful and that permit satisfaction to be attained from the life led. "Happiness" is one element that has been particularly emphasized and frequently examined over the years (Diener 2000). Investigation of the relevant literature shows that concepts such as happiness, well-being and subjective well-being have been considered together with life satisfaction and have been used interchangeably in certain contexts (Bradley and Corwyn 2004; Diener 2000; Diener and Diener 1996). Various research findings show that life satisfaction depends on the concept of well-being (Diener and Diener 2002; Diener et al. 1999). Subjective well-being is generally defined as happiness. In a wider sense, the individual's own life is expressed as an evaluation, one that has both cognitive and emotional dimensions. The emotional dimension contains pleasant and unpleasant emotional reactions, while the cognitive dimension contains feelings of contentment toward life as a whole, described as life satisfaction (Diener and Diener 1996; Pavot and Diener 1993). Individuals' states of mind and emotions manifest themselves in the experiences in their lives. Each individual manufactures wide-ranging thought patterns regarding his or her life as a whole. In this way, in addition to inferences that individuals make regarding various sections of their lives, the different components of subjective well-being become more visible. The contentment derived from life as a whole is defined as life satisfaction, a sub-dimension of subjective well-being (Diener 2000).

#### 1.5 The Present Study

The educational service to be made available for adolescents, who represent a valuable resource for the future and progress of all mankind, particularly in the societies in which they live, is a matter of great importance. In today's conception of education, in which individual tailoring of education and student-focused learning, and learning by doing and experiencing, are particularly important, it is unfortunate that there is a desire to confine students within various specific templates.

Examination of the relevant literature shows a preponderance of studies examining relations between the concept of metacognitive awareness and learning processes (Veenman et al. 2006; Vrugt and Oort 2008; Whitebread et al. 2009). However, there are few studies examining relations between metacognitive awareness and psychological structures. We encountered no studies examining the variables of metacognitive awareness and self-efficacy and life satisfaction together. Additionally, there are very few studies seeking to determine the metacognitive skills of adolescents (Carr and Alexander 1996; Cotton 2010; Hannah and Shore 2008; Morrissey 2011; Synder et al. 2011). We think that, in addition to filling a gap in the field, this study, an analysis of both the cognitive and psychological structures of adolescents, will also contribute to an understanding of the characteristics of adolescents. On that basis, the purpose of this study was to examine relations between adolescents' life satisfaction and levels of metacognitive awareness and perceived self-efficacy and to determine whether or not life satisfaction, metacognitive

awareness and self-efficacy vary according to gender. The hypotheses of the study based on a correlational model:

1. There is a significant correlation between the life satisfaction and metacognitive awareness levels of adolescents and their perceived self-efficacy.
2. Metacognitive awareness and self-efficacy are significant predictors of life satisfaction.
3. Life satisfaction, metacognitive awareness and self-efficacy vary according to gender.

## 2 Method

### 2.1 Research Design

This study, which investigated the strength of metacognitive awareness and self-efficacy to predict life satisfaction in adolescents, was designed in line with a correlational model. It aimed to permit full understanding or clarification of the complexity of the phenomena present in relational research. Associations can thus be determined between thought patterns and behavior descriptive variables (McMillan and Schumacher 2006). Fraenkel et al. (2012) state that correlational research serves two main purposes: (1) to explain human behaviors regarded as important and (2) to predict the probable outcomes of human behaviors. In agreement with the nature of correlational research, this study was intended to determine the power of independent variables (metacognitive awareness and self-efficacy) to predict a dependent variable (life satisfaction).

### 2.2 Research Group

The research group consisted of 492 adolescence, 261 (53 %) female and 231 (47 %) male. The ages ranged between 14 and 18, with a mean age of 15.89 (SD: 1.01). The research group was composed of science high schools students. In accordance with the objectives of the research, Personal Information Form, Metacognitive Awareness Inventory (MAI), Self-Efficacy Scale (SES) and Life Satisfaction Scale (LSS) were applied on groups of students having education in science high schools in three different provinces within classroom environment. In Turkey, science high schools are institutions which offer education to students equipped with high-level skills especially in cognitive field. It is accepted that students who are placed in science high schools by obtaining the highest scores from the placement examination conducted by the Ministry of National Education countrywide and consisting of mental performance-based and skill-weighted questions have the highest level of cognitive skills. In this line, the fact that science high school students exhibit high level cognitive skills can be interpreted as an indicator of that they can use their metacognitive skills efficiently. For this reason, this research was conducted on science high school students. In addition, science high school students have a highly prioritized position in terms of participation to national and international project development activities and scientific research. Therefore, it can be said that these students have a special interest to scientific research. It is observed that such an interest was exhibited by students during the present research as well.

### 2.3 Measures

The LSS was used to determine students' life satisfaction, the MAI to determine levels of metacognitive awareness and the SES to identify perceived self-efficacy. Students'

demographic characteristics were collected using a personal information form prepared by the authors.

### 2.3.1 *Life Satisfaction Scale*

The LSS is a seven-point Likert-type scale developed by Diener et al. (1985). In its original form, the LSS contains five items and has an internal consistency coefficient of .87. The Turkish language version of the scale developed by Yetim (1991) has an internal consistency coefficient of ( $\alpha$ ) .86. The test–retest reliability of the Turkish version of the scale has been determined at .73 (Yetim 2003). Results of confirmatory factor analysis conducted in current study indicated that the model was adequate fit to the data (RMSEA = .03; CFI = 1.00; GFI = .99; SRMR = .01). The internal consistency for the data obtained in this study is ( $\alpha$ ) .85.

### 2.3.2 *Metacognitive Awareness Inventory*

The original form of this scale, used to determine the metacognitive awareness levels of the adolescents comprising our research group, was developed by Schraw and Sperling-Dennison (1994). The inventory was adapted into Turkish by Akin et al. (2007). The original form of the scale consists of eight sub-factors under two main dimensions. The MAI is a five-point Likert-type scale—(1) never, (2) rarely, (3) frequently, (4) generally and (5) always. The original form of the scale, consisting of 52 items, has a Cronbach Alpha internal consistency coefficient of .95. The internal consistency coefficients of the sub-factors are reported to range between .88 and .93 (Schraw and Sperling-Dennison 1994). Exploratory factor analysis was first performed for the structural validity of the scale, and an eight-factor structure accounting for 47 % of total variance was determined. A significant correlation (.89) has been determined between the scores from the English and Turkish-language versions. The data obtained in the two different measures at investigation of test–retest reliability have been examined and a result of .95 reported. The reported split-half reliability of the scale is .91, with an internal consistence coefficient for the whole scale of ( $\alpha$ ) .95 (Akin et al. 2007). Results of confirmatory factor analysis conducted in current study indicated that the model was adequate fit to the data (RMSEA = .04; CFI = .85; GFI = .83; SRMR = .04). The internal consistency coefficient for the data obtained in the scope of this research was ( $\alpha$ ) .93.

### 2.3.3 *Self-Efficacy Scale*

Developed by Sherer et al. (1982), the SES assesses individuals' behaviors and changes there in. A five-point Likert-type scale it contains a total of 23 items. The original form of the scale has a two-factor structure; general self-efficacy and social self-efficacy. The SES was adapted into Turkish by Gözümlü and Aksayan (1999). At exploratory factor analysis for structure validity the scale, consisting of four sub-factors, accounted for 44.6 % of total variance. Factor loadings of the items in the scale range between .35 and .70. Investigation of the reliability of the scale has reported an internal reliability coefficient of ( $\alpha$ ) .81 and a test–retest reliability coefficient of .92. Results of confirmatory factor analysis conducted in current study indicated that the model was adequate fit to the data (RMSEA = .07; CFI = .86; GFI = .88; SRMR = .06). The internal reliability coefficient for the data obtained in this study was ( $\alpha$ ) .86.

### 2.3.4 Individual Data Form

The personal information form prepared by the authors was intended to collect demographic data such as age and gender.

## 2.4 Procedure and Analysis of Data

The related permissions of General Directorate of the Innovative and Education Technologies of Ministry of National Education were asked for the practice of necessary assessment instruments for the research. Afterwards, the main author of the research interviewed with directors of each three schools and the free days of students were determined. The main author visited schools on the determined day of each school. A different practice session was applied for each classroom and necessary explanations were made by the main author. Voluntary basis of the research participation was emphasized and only voluntary students participated in the study. The practice period lasted for around 40 min for each class. Data collection process ended within 5 days in three schools comprising the research group of this study. At the end of procedures completed in three sessions, data were transferred to a computer environment. Data transferred to a computer environment were analyzed on the Lisrel 8.51 and SPSS 17.0 software program. Pearson product-moment correlation coefficient, one-way multivariate analysis of variance (MANOVA) and multiple linear regression were used in the analysis of data.

## 3 Results

Findings regarding the study hypotheses are given below.

**Hypotheses 1** There is a significant correlation between the life satisfaction and metacognitive awareness levels of adolescents and their perceived self-efficacy.

Results, means and standard deviations of Pearson product-moment correlation coefficient analysis performed to answer that hypotheses is given in Table 1. This reveals that life satisfaction was significantly positively correlated with metacognitive awareness ( $r = .36, p < .001$ ) and self-efficacy ( $r = .28, p < .001$ ).

**Hypotheses 2** Metacognitive awareness and self-efficacy are significant predictors of life satisfaction.

**Table 1** Life satisfaction associations with metacognitive awareness and self-efficacy

| Variables | 1     | 2      | 3     |
|-----------|-------|--------|-------|
| 1. LS     | 1     |        |       |
| 2. MA     | .36** | 1      |       |
| 3. SE     | .28** | .41**  | 1     |
| Mean      | 23.67 | 190.35 | 83    |
| SD        | 6.62  | 22.67  | 14.20 |

LS life satisfaction, MA metacognitive awareness, SE self efficacy, SD standard deviation

\*\*  $p < .001$

Multiple linear regression analysis was used to answer this hypotheses. The results are shown in Table 2. Metacognitive awareness and self-efficacy account for 15 % of total life satisfaction variance ( $F_{(2,489)} = 45.25, p < .001$ ). Metacognitive awareness ( $\beta = .29, p < .001$ ) and self-efficacy ( $\beta = .16, p < .001$ ) made a significant contribution to the model.

**Hypotheses 3** Life satisfaction, metacognitive awareness and self-efficacy vary according to gender.

One-way multivariate analysis of variance (MANOVA) was used to determine gender-based differences in life satisfaction, metacognitive awareness and self-efficacy. However, various preliminary procedures are needed for MANOVA to be functional. The hypothesis of equality of variances was tested following the determination of moderate level ( $<.70$ ) direct linear relations among variables. Levene test results show that variances were homogeneously distributed for life satisfaction scores ( $p = .11, p > .05$ ), metacognitive awareness ( $p = .13, p > .05$ ) and self-efficacy ( $p = .51, p > .05$ ) (Table 3).

Once the homogeneous distribution of variances had been confirmed, one-way MANOVA results revealed that gender had no significant level of effect on life satisfaction ( $F = .10, p = .74, \eta^2 = .00$ ), metacognitive awareness ( $F = .01, p = .91, \eta^2 = .00$ ) and self-efficacy ( $F = 2.21, p = .13, \eta^2 = .00$ ) (Wilks' Lambda  $\lambda = .99, F_{(3,488)} = .843, p > .05, \eta^2 = .00$ ). To put it another way, the population means in the scores obtained did not vary according to gender.  $\eta^2$  (etasquare) expresses how much of the multivariate variance in dependent variables is explained by an independent variable (Shieh 2013). On that basis, since  $\eta^2 = .00$  we concluded gender had no explanatory effect on the dependent variables (Table 4).

#### 4 Discussion

The purpose of this study was to investigate the associations between the life satisfaction of adolescents and their metacognitive awareness and perceived self-efficacy, and to establish

**Table 2** Multiple linear regression analysis results for prediction of life satisfaction by metacognitive awareness and self-efficacy

| Variable | B    | SE   | $\beta$ | t    | p    | R   | R <sup>2</sup> | $\Delta R^2$ | F     |
|----------|------|------|---------|------|------|-----|----------------|--------------|-------|
| Constant | 3.77 | 2.11 |         | 1.78 | .075 | .39 | .15            | .15          | 45.25 |
| MA       | .07  | .01  | .29     | 6.49 | .001 |     |                |              |       |
| SE       | .07  | .02  | .16     | 3.60 | .001 |     |                |              |       |

MA metacognitive awareness, SE self efficacy

**Table 3** Levene test results

|    | F    | df <sub>1</sub> | df <sub>2</sub> | p    |
|----|------|-----------------|-----------------|------|
| LS | .42  | 1               | 490             | .118 |
| MA | 2.26 | 1               | 490             | .133 |
| SE | 2.44 | 1               | 490             | .117 |

LS life satisfaction, MA metacognitive awareness, SE self-efficacy



**Table 4** One-way MANOVA results regarding gender-based variations in life satisfaction, metacognitive awareness and self-efficacy

| Source          | Dependent variables | SS           | df  | MS           | F         | <i>p</i> | $\eta^2$ |
|-----------------|---------------------|--------------|-----|--------------|-----------|----------|----------|
| Corrected       | LS                  | 4.67         | 1   | 4.67         | .10       | .744     | .000     |
|                 | MA                  | 9.55         | 1   | 9.55         | .01       | .911     | .000     |
|                 | SE                  | 446.83       | 1   | 446.83       | 2.21      | .137     | .005     |
| Intercept       | LS                  | 274,506.20   | 1   | 274,506.20   | 6,250.37  | .001     | .927     |
|                 | MA                  | 1.77         | 1   | 1.77         | 23,148.31 | .001     | .979     |
|                 | SE                  | 3,372,050.75 | 1   | 3,372,050.75 | 16,745.23 | .001     | .972     |
| Gender          | LS                  | 4.67         | 1   | 4.67         | .10       | .744     | .000     |
|                 | MA                  | 9.55         | 1   | 9.55         | .01       | .911     | .000     |
|                 | SE                  | 446.83       | 1   | 446.83       | 2.21      | .137     | .005     |
| Error           | LS                  | 21,519.98    | 490 | 43.91        |           |          |          |
|                 | MA                  | 375,922.61   | 490 | 767.18       |           |          |          |
|                 | SE                  | 98,673.16    | 490 | 201.37       |           |          |          |
| Total           | LS                  | 297,194      | 492 |              |           |          |          |
|                 | MA                  | 1.82         | 492 |              |           |          |          |
|                 | SE                  | 3,488,505    | 492 |              |           |          |          |
| Corrected model | LS                  | 21,524.65    | 491 |              |           |          |          |
|                 | MA                  | 375,932.16   | 491 |              |           |          |          |
|                 | SE                  | 99,120       | 491 |              |           |          |          |

*SS* sum of squares, *MS* mean squares, *Df* degrees of freedom, *LS* life satisfaction, *MA* metacognitive awareness, *SE* self-efficacy

the role of metacognitive awareness and perceived self-efficacy in predicting life satisfaction. In supporting of the first hypothesis that there is a significant correlation between the life satisfaction and metacognitive awareness levels of adolescents and their perceived self-efficacy, was clearly supported with the results (Table 1). The variable most powerfully correlated with life satisfaction was metacognitive awareness. This may be interpreted as the life satisfaction of adolescents being capable of varying in proportion to the ability to use metacognitive skills effectively. When individuals encounter situations in their lives requiring the exhibition of cognitive performance, success or problem solving achieved using metacognitive skills may influence their life satisfaction. In one study of adolescents, Leung and Leung (1992) concluded that successful performance in the academic, physical and social fields was associated with life satisfaction. Various research findings show significant associations between academic success and life satisfaction (Abolghasemi and Varaniyab 2010; Suldo et al. 2006; Suldo et al. 2008; Vecchio et al. 2007). It is therefore to be expected that there will be significant associations between life satisfaction and metacognitive skills, the basis for the successes achieved by adolescents with a high level of academic success. In contrast to these findings, however, in a study of primary school students, Huebner (1991) reported that there was no significant association between students' recent successes at school and life satisfaction.

Examination of the findings from the study shows a significant association between life satisfaction and self-efficacy. In one study with similar findings, Gilman and Huebner (2003) reported a significant correlation between life satisfaction and self-efficacy.

Vecchio et al. (2007), who emphasized that the role played by self-efficacy in the development and maintenance of life satisfaction should not be ignored, determined significant correlations between life satisfaction and academic and social self-efficacy in a study involving adolescents. Individuals who effectively assess their own cognitions and behaviors develop a weak or strong perceived self-efficacy toward themselves. Bearing in mind that the individual exhibits constant development from birth to death and encounters a variety of situations within that process, it may be said that individuals with a high perceived self-efficacy may deal more easily with developmental tasks and are relatively more successful than individuals with a low perceived self-efficacy. Individuals who struggle against problems they encounter with the skills they possess are thought to be more content in their lives. Significant associations between self-efficacy and life satisfaction can be seen in studies involving differing research groups. Charrow (2006) emphasized that quality of life and life satisfaction are important elements as individuals' ages increase, and reported, in a study of elderly individuals, that self-efficacy is a significant predictor of life satisfaction.

The second hypothesis that metacognitive awareness and self-efficacy are significant predictors of life satisfaction is completely supported by the data of the current study (Table 2). Adolescents, who make more effective use of various metacognitive abilities, particularly in the face of certain cognitive and performance-based situations or problems, are thought to be able to increase their life satisfaction through successes achieved through their own efforts in the face of difficulties they encounter. Metacognitive awareness, crudely defined as reflection on cognition, and self-efficacy were determined as significant predictors of life satisfaction. There has been particular concentration on the fact that individuals' perceived self-efficacy affect their entire lives. According to Aydiner (2011), who states that individuals with high self-efficacy set objectives and are more successful in achieving them, individuals who achieve their objectives obtain greater satisfaction from life. The success that adolescents achieve in their academic lives has a positive impact on their perceived self-efficacy (Pajares 1996a, b; Zimmerman and Martinez-Pons 1990). In that light, adolescents' life satisfaction also being affected by perceived self-efficacy may be interpreted as an expected outcome.

This research concluded that adolescents' life satisfaction does not vary on the basis of gender. The third hypothesis that life satisfaction, metacognitive awareness and self-efficacy vary according to gender was not confirmed with the results (Table 4). Adolescents capable of making effective use of superior cognitive abilities are thought not to restrict these skills to academic fields, but also to use them in establishing a world perspective they employ throughout their lives. Cognitive skills combined with perceived self-efficacy enable individuals to achieve many successes in their lives.

In the light of the findings obtained, gender has no explanatory role in male and female students' metacognitive awareness. Several studies of adolescents have reported that metacognitive awareness does not vary according to gender (Aydın and Coşkun 2011; Memnun and Akkaya 2009; Rahman et al. 2010; Sczesny and Kühnen 2004). However, we also encountered studies showing a significant level of gender-based variation in metacognitive awareness (Aktürk and Şahin 2010; Liliana and Lavinia 2011). According to Topçu and Tüzün (2009), who define gender as a biological characteristic by emphasizing the cultural effects on it, gender is a significant variable in the development of metacognitive awareness in primary school students. In an experimental study examining the metacognitive skills employed by primary school students in their reading skills, Spence et al. (1999) reported that metacognitive awareness did differ according to gender.

Finally, adolescents' perceived self-efficacy also did not vary according to gender. Individuals capable of including self-regulation skills in various cognitive, emotional and social processes and of performing self-assessment exhibit highly developed perceived self-efficacy. These expressed skills are of a similar nature to metacognitive awareness process not observed to vary according to gender, and are thought to affect the lack of gender-based variation in perceived self-efficacy. Pajares (1996a, b) obtained parallel findings to our own in studies involving self-efficacy, reporting that adolescents' perceived self-efficacy did not vary according to gender. Turki and Al-Qaisy (2012) performed a similar study and reported that gender was not a significant variable in the determination of adolescents' perceived self-efficacy.

## 5 Limitations

Although the satisfactory results for predictors of life satisfaction were gathered, there were several limitations in this study, as expected in every study. Primary limitation of the current study is the cross-sectional design. Research variables were evaluated by means of same measures at one moment in time. Therefore, the research is limited to gather data in which quantitative research methods were used. Supporting study results by qualitative data from meetings and observations should be beneficial to comprehend deeply the cognitive aspects of life satisfaction. Because of the fact that the research group is non-random sample of science high school students, generalizability of the results is the other limitation of study. To get an evidence for temporal stability of the results of the data, research should be conducted with similar sample. The current study should be assessed in the light of those limitations.

## 6 Implications

Our scan of the relevant literature revealed no studies investigating life satisfaction's associations with metacognitive awareness and self-efficacy. Therefore, in terms of generalizing the study results, studies involving adolescents may fill the gap in the literature. The results show that life satisfaction is predicted by cognitive and social variables. Hence, investigating associations between adolescents' life satisfaction and academic and social self-efficacies in addition to general self-efficacy may be useful in order for students to make the requisite adjustments in their academic and social lives. Beside from research variables, it is well known that social support has an effect on life satisfaction. Suldo and Huebner (2006) reported that adolescents' receiving social support from family are satisfied their lives. In this direction, informing parents as to the metacognitive skills in relation to learning behaviors (Veenman et al. 2006), which is a one of the indicators of life satisfaction, may be effective in adolescents' social support. Additionally, the casual researches in relation to the models which enable to explore direct and indirect effect of metacognitive skills and various self-efficacy perceptions on adolescents' life satisfaction could be conducted. These efforts could be helpful in exploring the casual directions. In conclusion, the results also reveal important implication for school education. Lessons in schools might concentrate on how metacognitive skills can be effectively used. Guidance activities and seminar programs on the subject might be arranged for teachers.

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