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Relationships between Thinking Styles and Behaviors Fostering Creativity: An Exploratory Study for the Mediating Role of Certain Demographic Traits

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Abstract

This paper aims to examine the role of demographic traits of Turkish teachers on the relationship between their thinking styles and creativity fostering behaviors. Three studies were conducted to investigate these relationships. In the first study, 202 Turkish elementary and secondary school teachers were included; in the second, 106 novice teachers were participants; and in the third, 246 student teachers participated. The Thinking Styles Inventory (TSI) and Creativity Fostering Teacher Index Scale (CFTIS) were administered to all three sample groups. An exploratory factor analysis, correlation, ANCOVA, hierarchical and logistic regression, and structural equation modeling analysis were conducted on the data. All three studies indicated that Type I thinking styles are a powerful predictor for creativity fostering behaviors. The results of Study 1 indicated that both the teachers' branch and the amount of work experience are significant mediators of the relationships between thinking styles and creativity fostering behaviors. The results of Study 2 indicated that the relationship between Type II thinking styles and creativity fostering behaviors is not significant. The results of all three studies, however, demonstrated that although the relationships between thinking styles and creativity fostering behaviors are significant, they are partially mediated by teachers' branch/department. These studies also determined that gender is not a significant factor in these relationships. Finally, there is a general discussion that ties the information collected together from the results of the three studies.

Key Words

Creativity, Creativity Fostering Behaviors, Demographic Traits, Novice Teacher, Student Teacher, Teacher, Thinking Styles.

Thinking styles can be defined as an individual's preferred way of using their abilities and of processing data (Sternberg, 1997). Thinking styles affect not only one's form of creativity, but also one's outlook and path in life. There are various theories regarding thinking styles in the appropriate literature; one of them being the theory of mental self-government developed by Sternberg (1988). The present study is based on the theory of mental self-government and Cropley's (1997a) list of teacher behaviors that foster creativity.

The Theory of Mental Self-government

The theory of mental self-government addresses the profile of different thinking styles each person uses instead of confining them to a single thinking style. The theory states that thinking styles should be understood in terms of constructs from human notions of government. Based on this view, the forms of government that have manifested throughout the world are not merely coincidental, but are external

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reflections of the ways people organize themselves. This theory of thinking styles may also be applied to education, in addition to other domains of both personal and professional life (Sternberg, 1988, 1997; Sternberg & Zhang, 2005; Zhang, 1999, 2001a, 2001b; Zhang & Sternberg, 2002).

According to Sternberg (1988; 1997), thinking styles can be measured and improved. Furthermore, researchers have suggested that there are a number of variables affecting the development of thinking styles, such as gender, age, parenting style, type of school, teaching and assessment methods, amount of work experience, branch/profession, and culture (Sternberg, 1994, 1997; Yıldızlar, 2010; Zhang, 2004a, Zhang & Sachs, 1997). As suggested by Sternberg (1988; 1997), there are 13 thinking styles that fall into five categories: (a) functions (including legislative, executive, and judicial styles), (b) forms (hierarchical, monarchic, oligarchic, and anarchic styles), (c) levels (global and local styles), (d) scopes (internal and external styles), and (e) leanings (liberal and conservative styles). These styles have been discussed and described in many previous studies(e.g. Duru, 2004; Sternberg, 1988, 1997; Sternberg, Grigorenko, & Zhang, 2008; Zhang & Sternberg, 2005). Although describing the characteristics of each thinking style is beyond the scope of this paper, these 13 styles have been re-conceptualized by Zhang (2001a; 2001b; 2002a; 2008) into three types of styles on which this paper will focus. They are described below.

The Thinking Styles Inventory (TSI), developed by Sternberg (1997) based on the theory of mental self-government, has been used frequently by researchers. Likewise, other inventories, such as the Thinking Styles in Teaching Inventory (TSTI), the Thinking Styles Questionnaire for Teachers (TSQT), and the Preferred Thinking Styles in Teaching Inventory (PTSTI) were developed based on the same theory (Sternberg et al., 2008). These inventories have been used in various fields, such as the many studies conducted on gifted students' thinking styles (e.g. Dai & Feldhusen, 1999; Sari & Sünbül, 2004; Sternberg & Grigorenko, 1993). There are also studies available in the literature investigating the relationships between thinking styles and personality traits (e.g. Balkıs & Işıker, 2005; Başol & Türkoğlu, 2009; Zhang, 2000, 2001b, 2002b, 2002c, 2006, 2010; Zhang & Huang, 2001; Zhang & Sachs, 1997). However, Dai and Feldhusen (1999) indicated that measures of thinking styles are different from the traditional measures of personality traits. Research investigating the relationship between thinking styles and demographic traits indicate that demographic traits (i.e., gender, age, grade of class, and amount of work experience) affect thinking styles (e.g. Balkıs & Işıker, 2005; Başol & Türkoğlu, 2009; Çubukçu, 2005; Zhang, 1999). Many researchers report that thinking styles are related to learning styles and academic achievement (e.g. Buluş, 2006; Cano-Garcia & Hughes, 2000; Zhang, 2001a, 2002a, 2002d, 2003, 2004b, Zhang & Sternberg, 1998, 2000). Fjell and Walhovd (2004) found that a significant relationship between thinking styles and five-factor personality model did not exist.

Types of Thinking Styles

Zhang (2001a; 2001b; 2002a; 2008) proposed a categorization of thirteen thinking styles into three types. According to Zhang (2008), Type I thinking styles tend to be of those that generate creativity and denote higher levels of cognitive complexity, including legislative (being creative), judicial (evaluating other people or products), hierarchical (prioritizing one's tasks), global (focusing on the holistic picture), and liberal (taking a new approach to tasks) styles. Individuals whose thinking styles are in this category tend to take risks and disobey norms. Type II thinking styles, however, tend to favor norms and denote lower levels of cognitive complexity, including the executive (implementing tasks with given orders), local (focusing on details), monarchic (working on one task at a time), and conservative (using traditional approaches to tasks) styles. People who possess these thinking styles tend to comply with norms and authority. Type III thinking styles comprise anarchic (working on whatever tasks come along), oligarchic (working on multiple tasks with no priority), internal (working alone), and external (working with others) styles, possibly manifesting certain characteristics of either Type I and II styles depending on the stylistic demand of a specific task. For example, one could use the anarchic style in a sophisticated way (characteristic of Type I styles) by dealing with different tasks as they arise without losing focus of the central issue. In contrast, one could instead use the anarchic style in a more simple way (characteristic of Type II styles) by dealing with tasks as they come along without knowing how each task is to contribute to the ultimate goal. Zhang (2003) found five factor structures for TSI that significantly contribute to critical thinking dispositions. In many of her above-mentioned studies, Zhang focused on Type I and II thinking

styles, but did not investigate Type III because she focused on testing the two types of styles (Types I and II) whose characteristics are markedly distinct from the each other. As previously mentioned though the characteristics of Type III's styles are very task dependent. For this reason, the present paper focuses on Type I and Type II thinking styles, not focuses on Type III thinking styles.

Research on Different Types of Teacher Thinking Styles

There are many studies that explore the relationships between thinking styles and different characteristics of teachers. One of them conducted by Sternberg and Grigorenko (1995) found that grade level, teacher age, subject area, and ideals are significantly related to a teacher's thinking style. Their findings also revealed that teachers are more legislative and less executive in lower grades than they are in upper grades. Teachers in upper grade levels (secondary school teachers) are forced to follow a more rigidly prescribed curriculum than teachers in lower grades are required to follow. They also found, like Fan & Ye (2007), that older teachers tend to be more executive, local, and conservative than younger teachers. In addition, Zhang and Sternberg (2002) investigated the relationship between the TSQT and teachers' characteristics, the results of which indicated that certain demographical characteristics (i.e., gender and professional work experience) of teachers had an important correlation with thinking styles. The TSQT resulted in a two-factor solution just as it did in the TSI.

In a separate study, Zhang (2004a) found that the PTSTI has a two-factor structure, similar to the TSI and TSTI. Her results indicated that even after age, gender, and academic discipline were controlled, particular thinking styles predisposed students to particular teaching styles. Similarly, Fan and Ye (2007) investigated the relationship between teaching styles and teachers' characteristics, finding that, with the exception of a global style, the same factor structures existed for the TSTI as Zhang found in her research (2001c; 2002a; 2008). Their results showed that female teachers preferred judicial and conservative styles more than male teachers did and that younger teachers were inclined to be more creative and open, albeit less compliant or conservative, in their teaching practices than their older counterparts were. Nonetheless, with increasing age, their teaching styles became seemingly more compliant and conservative, and less active or liberal. Zhang (2001c) examined the relationship between teaching approaches and the TSTI. In her findings, the TSTI has two factor solutions, revealing that teaching approach and style are actually two overlapping constructs with different labels. The differences between approach and style are in degree, not in kind. Zhang (2008) carried out a similar study in which she sought to explore whether teachers' teaching styles were consistent with their thinking styles. Her participants responded to the TSI-Revised and TSTI. Zhang (2008) found out that the TSI in this study had the same factor structure as her previous study (Zhang, 2001c). According to her results, teachers whose thinking styles were predominantly Type I tended to use Type I teaching styles whereas teachers whose thinking styles were predominantly Type II would tend to use Type II teaching styles. The results showed that after controlling participants' age, gender, length of teaching experience, school level, academic discipline, and average class size, teachers' teaching styles were statistically predictable according to their thinking styles. Again, she concluded that thinking and teaching styles are related to each other, merely consisting of different constructs. Dai and Feldhusen (1999) performed another study in which they examined the internal and external validity of the TSI and although their results provide evidence of the external discriminant validity, they only lend partial support to the internal validity of the instrument. Moreover, their study yielded mixed and somewhat different findings from Zhang's study (2001a; 2001b; 2004a; 2008).

Research on Turkish Teachers' Thinking Styles

Although many researchers have investigated teachers' thinking styles in the applicable literature, research focusing on teachers' thinking styles in Turkey is limited. When reviewing the findings of studies on teachers' thinking styles, one should consider that most of these studies have been conducted in certain countries. In addition, the overall number of studies investigating teacher's thinking styles is limited. Moreover, the research studies conducted in Turkey have only studied the 13 different types separately. For example, Palut (2003) studied 558 primary school teachers' thinking styles using the TSI, finding that male teachers favored more legislative, global, local, and internal thinking than female teachers did. Üredi and Üredi (2007) found significant relationships between the TSI and Teaching Profession Perception Inventory

(TPPI). In another study, Baloğlu and Karadağ (2009) found significant relationships between Turkish teachers' professional work experiences and constructive thinking styles.

Yet, there has been no study conducted thus far on the thinking styles of novice teachers' thinking styles in Turkey, It is possible, however, to procure a number of studies conducted on Turkish student-teachers' thinking styles (e.g. Buluş, 2005, 2006; Çubukçu, 2005; Saracaloğlu, Yenice, & Karasakaloğlu, 2008; Yıldızlar, 2010, 2011). Some of which (Buluş, 2005; Çubukçu, 2005; Yıldızlar, 2010, 2011) have revealed that male students who will become student-teachers have more legislative thinking styles than their female counterparts do, and others showing that male student who will become teachers have more conservative teaching styles than females in similar situations (Başol & Türkoğlu, 2009; Yıldızlar, 2010). Saracaloğlu et al. (2008) and Çubukçu (2005) found no significant difference between the thinking styles of those studying to become teachers in terms of age, gender, and branch. Yıldızlar (2011) revealed that the liberal thinking style was more commonly found among those preparing to become secondary school teachers. Finally, while most of the studies in the literature regarding Turkey have focused on the relationship between thinking styles and demographic traits, none have considered behaviors fostering creativity in these relationships.

Fostering Creativity

Creativity is the ability to produce work that is relatively novel, high in quality, and appropriate to the task (Amabile, 1996; Sternberg & Lubart, 1995). Family, teachers, and environment have a significant impact on the development of one's level of creativity. Although the current psychological theories of organizational creativity hold that environment plays an important role in fostering creativity, a study by Amabile (1983) finds it to have low influence. A teacher's teaching practice in class may encourage children and teenagers either to develop their level of creativity or cause it to decline. However, tangible reward has a negative effect on student's creativity (Amabile, Hennessey, & Grossman, 1986). Kim and Schallert (2011) emphasize the relationship between teachers and students in the education process. Similarly, Torrance (1968; 1995) emphasizes that the relationship between teacher and student is important for students to further their creativity. The democratic behaviors of teachers toward students support their development of creativity (Erdogdu, 2006). Cropley (1997b) rejects the idea of authoritarian classroom management for a learning environment fostering creativity; instead, Cropley advocates that fostering creativity in class is a process, which emphasizes differences instead of one attempting to form a homogeneous environment. There are many studies on the characteristics of effective teachers (e.g. Giovannelli, 2003; Minor, Onwuegbuzie, Witcher, & James, 2002). Although these studies have investigated effective teachers' characteristics, none examine teacher behaviors that foster creativity . Such studies on the characteristics of effective teachers demonstrate the need to investigate the relationship between thinking styles and creativity fostering teacher behaviors.

Sternberg and Lubart (1995) emphasized the importance of certain personality attributes such as one's willingness to take sensible risks and willingness to overcome obstacles for creativity. Sungur (1997) noted that teachers who stimulate freedom in students and who accept students as individuals, encouraging them to do their best, are the ones who foster creativity. On the other hand, those teachers who discourage and heavily criticize students, those who are unreliable and inconsistent in their behaviors prevent their students from fostering creativity. If a teacher introduces students to information in a new or different way, this teacher may be regarded as creative. Creative teaching requires not only meeting the complex educational needs of various types of students, but also improving students' skills by enabling them to process this new information in an effective way (Reilly, Lilly, Bramwell, & Kronish, 2011). Cropley (1997a, p. 98) describes a teacher who instills creativity in his/her students as a teacher "having a co-operative, socially integrative style of teaching, who encourages flexible thinking, promotes self-evaluation in students, takes students' suggestions, and who questions seriously." Teacher behaviors that foster creativity may vary according to one's demographic traits. For example, Soh's study (2000) found significant differences between male and female teachers as female teachers displayed more creativity fostering behaviors.

The Relationship between Thinking Styles and Fostering Creativity

There is consensus among researchers investigating the relationship between thinking styles and fostering creativity. Zhang and Sternberg (2009)

emphasized the conceptual link between thinking styles and creativity. Additionally, Kaufman (2002) stated that individuals with a holistic way of thinking play a critical role in fostering creativity. Zhang (2002a) found that the analytic mode of thinking has a significant and positive correlation with Type II thinking styles, while it has a significant and negative correlation with Type I thinking styles. Zhang (2002a; 2002d) and Zhang & Sternberg (2005) proposed a number of creativity generating thinking styles. Type I thinking styles, thus, carry positive adaptive values, whereas the latter set of style constructs, along with Type II thinking styles, carry negative adaptive values, at least in certain contexts. Creative people are, to some extent, often anarchic, defying conventional ways of organizing knowledge and even themselves. In this aspect, the anarchic thinking style manifests characteristics of Type I thinking styles. In a recent study, Zhu and Zhang (2011) found a significant relationship between university students' thinking styles and their conceptions of creativity; their results reveal significant differences between thinking styles (legislative, judicial, and liberal styles) and conceptions of creativity in terms of gender and field of study (i.e., social sciences, science studies, and art studies). The findings suggest that Type I thinking styles are associated with nurturing the creativity of students. Zhang (2001c) found that a student-focused strategy was collected in the same factor structure with Type I thinking styles, and they were related to each other. In another study of hers, Zhang (2008) found a relationship between Type I thinking styles and Type I teaching styles; in a different study (2007) Zhang found a significant relationship between legislative thinking styles, liberal teaching styles, and one's creative ability.

Purpose

Many of the above-mentioned studies provide evidence of the relationship between thinking styles and creativity fostering teacher behaviors. Although evidence exists for these relationships, it appears that the relationships between teachers' thinking styles, demographic traits, and creativity fostering teacher behaviors have been neglected. This study considers these relationships. Although demographic traits can be considered a significant mediator in these relationships, these demographic traits of teachers are expected to be reduced in this relationship. Based on the theoretical and empirical works reviewed, the current researcher has conducted three exploratory studies in which he has examined the hypothesized model of the relationship between Turkish teachers' thinking styles and their creativity fostering behaviors, as well as the mediating role of gender, age, length of work experience (LWE), and branch/department. Three studies have been designed because the demographic traits and characteristics of the study groups are different from each other. Specifically, the teachers in Study 1 are qualified, with at least two years of experienced, while the teachers in Study 2 are novice teachers and the teachers in Study 3 are student teachers. Since it is estimated that none of the relationships on the three study groups will have different results, investigating the relationships among demographic traits, thinking styles, and creativity fostering behaviors on the different study groups may help to increase the quality of the teacher training system in Turkey.

Study 1

In Study 1, I included gender, age, LWE, and branch of study/education to test the relationship between thinking styles and creativity fostering teacher behaviors, as well as to test the mediating role of the effects of these observed variables.

Hypotheses

It is predicted that:

(a) While the TSI is a two-factor structure, the Creativity Fostering Teacher Index Scale (CFTIS) is a single-factor structure.

(b) There are significant relationships among Type I, Type II, and the CFTIS; and, that there are significant relationships between gender, age, length of work experience, branch of study/education, and Type I, Type II, and CFTIS.

(c) Type I thinking styles (including legislative, judicial, global, and liberal styles) and Type II thinking styles (including executive, local, and conservative styles) have direct effects on the CFTIS.

(d) Finally, these demographic traits are significant mediators of the relationships between Type I, Type II, and the CFTIS.

Hypothesized Model

To examine these relationships, a path model was proposed for all the relationships between two latent variables (Type I and II thinking styles)

and another latent variable (the CFTIS). It also included the significant relationships, the predicted relationships, and another with mediating role of four observed variables (gender, age, LWE, and branch) in these relationships (Model 1). This proposed model was based on the reported results in previous studies related to the thinking styles. Since the proposed model was not tested in previous studies, it is being examined in an exploratory manner in this paper. Given that demographic traits, Type I and Type II thinking styles, and the CFTIS have a high potential to be associated with each other, it is logical to consider demographic traits as a mediator variable instead of as a moderator variables. This is because moderator variables are accepted when there is a weak or inconsistent relationship between predictors and the outcome variable (Baron & Kenny, 1986; Iacobucci, 2012; MacKinnon & Cox, 2012). Figure 1 presents the model of hypothesized structural relationships in which the independent and dependent variables are continuous, and the mediator variables are categorical (Iacobucci, 2012).

Method

Participants

The total number of participants consisted of 202 elementary and secondary school teachers from 13 different primary schools (Primary schools include elementary and secondary schools) within the relatively urbanized center of Niğde, a province in Central Turkey. Regarding the gender of the teachers, 54.5% (f=110) were female and 45.5% (f=92) were male. The distribution of the age of teachers is as follows: those ranging between 20 and 30 years old comprised 16.3% (f=33) of the sample; those between the ages of 31 and 40 years old totaled 41.1% (f=83); those between 41 and 50 years old were 33.7% (f=68); and those 51 years old or above were 8.9% (f=18) of the sample. The level of experience of the teachers ranged from 1 year to more than 21 years: 25.7% (f=52) of the teachers had between 1 and 10 years of experience; 40.1% (f=81) had between 11 and 20 years; and 34.2% (f=69) of the sample of teachers had more 21 years or more of experience. The participating teachers taught in elementary and secondary schools: 44.6% (f=90) were elementary school teachers and 55.4% (f=112) were secondary school teachers. Of the secondary school teachers, 14% (f=13) were Turkish language teachers, 14% (f=13) foreign language teachers, 10.8% (f=10) mathematics teachers, 10.8% (f=10) science and technology teachers, 9.7% (f=9) social studies education teachers, and 9.7% (f=9) were visual arts teachers.

Instruments

In order to assess the relationship between teachers' thinking styles and their creativity fostering behaviors, two data collection instruments were administered simultaneously. These instruments are the Thinking Styles Inventory (TSI), developed by Sternberg (1997), and the Creativity Fostering Teacher Index Scale (CFTIS), developed by Soh (2000).

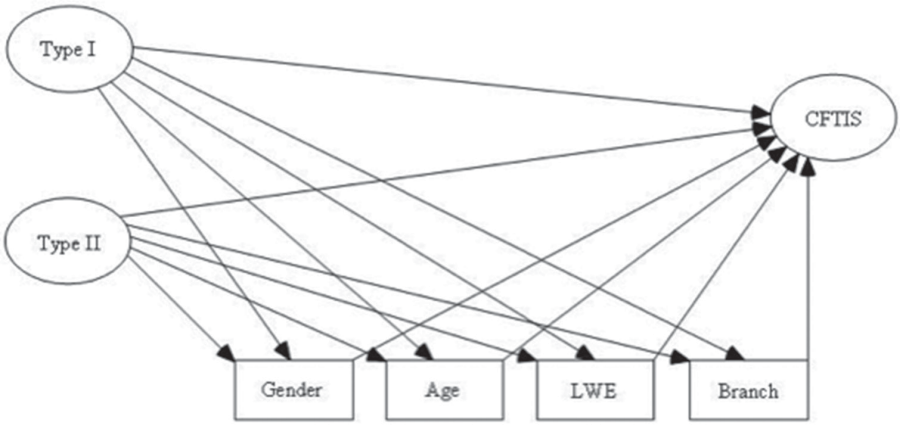


Figure 1.

The Hypothesized Model 1 for Study 1: Type I= Thinking Styles (including legislative, judicial, global, and liberal styles), Type II= Thinking Styles (including executive, local, and conservative styles). CFTIS= Creativity Fostering Teacher Index Scale

Thinking Styles Inventory (TSI): This instrument was developed based on Sternberg's (1988) theory of mental self-government; the TSI is a self-report questionnaire in which respondents rate themselves on a 7-point scale ranging from 1 (not at all well) to 7 (extremely well) describing the way they normally carry out their tasks. Zhang (2008) noted that Type I thinking style scales (including legislative, judicial, global, and liberal styles) were loaded on the first factor, whereas Type II thinking style scales (including executive, local, and conservative styles) were clustered in the second factor. Two sample items for Type I styles are "I like tasks that allow me to do things on my own way" (legislative style) and "I like to do things in new ways not used by others in the past" (liberal style). Two sample items for Type II styles are "I like problems that require engagement with details" (local style) and "In my work, I like to keep close to what has been done before" (conservative style) (Sternberg et al., 2008). The Turkish version of the forms of the TSI (Sternberg, 1997, 2009) are available and commonly used in the Turkish literature. There are also two adaptation studies of the TSI into Turkish from English, the first of which by Sünbül (2004) and the second by Fer (2005). In Sünbül's adaptation study, 94 items represent 13 thinking styles and the TSI is a 5-point Likert type. The Cronbach's alpha coefficient for the internal consistency of all the items of the TSI was .91. In the adaptation study conducted by Fer, 104 items represent 13 thinking styles, and the TSI is a 7-point Likert type. The Cronbach's alpha coefficient for the internal consistency of all the items of the TSI was .89.

The Turkish TSI form by Sünbül (2004) was re-analyzed for the present study. The TSI was designed to measure the teachers' seven thinking styles: legislative, executive, judicial, global, local, liberal, and conservative; without measuring either the forms (hierarchical, monarchic, oligarchic, and anarchic styles) or scopes (internal and external styles). There are eight items constituting one scale, which assess each style. The 56 items represent these seven thinking styles completely. Just as Zhang (2008) did not examine Type II styles, the current scholar did not either for the following reason: This study is an initial exploration of the relations between Turkish teachers' thinking styles and their creativity fostering behaviors. As such, it is desirable to focus on testing the two types of styles (Types I and II) that have distinct characteristics rather than to include Type III styles, whose characteristics are very task dependent. The TSI was used as a 5-point Likert type scale in the present study (ranging from 1 "not at all well" to 5 "extremely well"). The Cronbach's alpha coefficients were calculated for the internal consistency of the TSI. The alpha coefficient was .79 for the legislative, .69 for the executive, .72 for the judicial, .67 for the global, .89 for the local, .79 for the liberal, and .91 for the conservative styles. For all items, the internal consistency was .90. These alpha values show that Turkish form of the TSI is reliable.

Creativity Fostering Teacher Index Scale (CFTIS): Cropley (1997a) delineates a list consisting of nine items concerning the creativity fostering teacher behaviors in the classroom which Soh (2000) later converted into a six-point Likert type scale. Soh's scale includes a 45 item self-report questionnaire in which respondents rate themselves on a 6-point scale ranging from 1 (never) to 6 (all the time). The scale was designed to measure creativity fostering teacher behaviors: independent, integration, motivation, judgment, flexibility, evaluation, question, opportunities, and frustration. The five items that constitute one scale assess each teaching style. Two sample items are "I expect my students to check their own work instead of waiting for me to correct them" (evaluation) and "I listen patiently when my students ask questions that may sound silly" (question). Soh (2000) renamed this scale the Creativity Fostering Teacher Index Scale (CFTIS). The CFTIS was adapted from English into Turkish by Dikici (2013). During which, each item was translated from English into Turkish and then re-translated from Turkish into English. To establish language equivalency, first the English form, and then Turkish form of the CFTIS was applied to 30 English lecturers (their native language being Turkish) from Niğde University in Turkey where significant correlations were found between the English and Turkish form items. Furthermore, a face-to-face interview was held with some of the lecturers for the items. Later, it was decided that the CFTIS should be converted into a 5-point Likert type (from 1=never to 5=all the time) and applied to 288 teachers working in the province of Niğde in order to analyze the validity and reliability of the scale. An exploratory factor analysis (EFA) revealed that the Turkish form of the CFTIS had nine sub-scales with 33 items and its measure of sampling adequacy (MSA) value was .92. After performing the Varimax rotation method, the factor loadings varied between .46 and .78. The alpha coefficients were calculated for internal consistency, revealing the independent alpha coefficient to be .64, integration to be .67, motivation to be .77, judgment to be .62, flexibility to be .69, evaluation to be .57, question to be .71, opportunities to be .64, and frustration to be .75.

The internal consistency for all items was .94. The confirmatory factor analysis (CFA) results revealed a good fit for the scales of the CFTIS. Based on these results, it has been determined that the CFTIS could measure the creativity fostering behaviors used in the classrooms of Turkish teachers.

Procedure

The TSI and the CFTIS were administered to teachers by the researcher in April and May of 2011. Participating teachers were selected on a volunteer basis for which legal permission was obtained from the Niğde Provincial Directorate of National Education on March 25, 2011. Teachers filled out the instruments in a time period ranging between 25 and 35 minutes. They were asked to provide basic demographic information such as gender, age, school name, length of work experience and branch.

Data Analysis

The data was analyzed using SPSS 15 software and an EFA was performed. The literature includes different suggestions about the sample size required to perform an EFA. Hair, Black, Babin, and Anderson (2010) state that generally a sample of fewer than 50 observations could not be factor analyzed, and ideally, the sample size should be more than 100. Bartlett's test and the MSA also provide insight into the appropriateness of the EFA. Low MSA values indicate that the sample is not sufficient. According to Hair et al. (2010), for the MSA, a score of .70 or above is good, .50 or above is poor, and below .50 is unacceptable. Generally, a factor loading value of an item should be .45 or more (Hair et al., 2010). In light of this information, an EFA was conducted for this data, and the Varimax factor rotation technique was applied. Cronbach's alpha coefficient was chosen as the internal consistency estimates. There should be significant correlations among the variables included in the model (Baron & Kenny, 1986), therefore, both a zero-order and partial correlation analyses were conducted in order to ascertain whether there were significant relationships among the variables. Then, an ANCOVA analysis was conducted to determine whether demographic traits had a significant effect on thinking styles and the CFTIS.

After the hierarchical and logistic regression analyses were conducted, a structural equation modeling (SEM) analysis was conducted to examine the mediating roles of the demographic traits using a more robust method (Iacobucci, Saldanha, & Deng, 2007; Kim & Bentler, 2006). The hypothesized model was tested using AMOS 7. The evaluation of the model's adequacy was based on the Minimum value of the discrepancy function (CMIN/x^2), Root Mean Square Residual (RMR), Root Means Square Error of Approximation (RMSEA), Normed Fit Index (NFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), and Adjusted Goodness-of-Fit Index (AGFI), in addition to its lower and upper confidence interval boundaries (Byrne, 2010; Hair et al., 2010; Hu & Bentler, 1995; Schermelleh-Engel, Moosbrugger, & Müller, 2003; Schumacker & Lomax, 2004). Additionally, linearity, multicollinearity, and singularity assumptions for SEM analysis were met. The multivariate kurtosis=1.84 and critical ratio=1.33 (kurtosis for Type I=.33, Type II=.27, and CFTIS=.12 in absolute value) indicated that the data distributions were close to normal, because critical ratio values higher than 5.00 are indicative of data that are non-normally distributed (Bentler, 2005), and absolute values higher than 10.0 for the kurtosis index suggest a problem, and higher values than 20.0 are an extreme problem (DeCarlo, 1997; Kline, 2005). Mahalanobis d^2 ranged from 5.36 to 17.34 (p>.05). Because of the large p-values of the Mahalanobis d^2, none of the observations under the assumption of normality should be treated as outliers. Thus, the maximum likelihood estimation in the SEM analysis was performed for this study.

Preliminary analyses of joint effects among predictor variables indicated that none of the interactions were significant as *ps* was from .112 to .977, and η^2 was from .008 to .032 on Type I thinking style scores; *ps* was from .126 to .815, and η^2 was from .004 to .034 on Type II thinking style scores; and *ps* was from .190 to .956, and η^2 was from .007 to .039 on the CFTIS scores. With these findings, the demographic traits (gender, age, LWE, and branch) were placed into the model derived from the hypothesis. Thus, no terms for predicting joint effects were included in the SEM model. The model was tested to determine if the thinking styles through the demographic traits either directly or indirectly predicted the CFTIS. Sobel's z test was conducted to examine the importance of the mediating role of demographic traits in these relationships. If the mediator turned the relationships between thinking styles and CFTIS from significant to insignificant, it was understood as a full mediator; however, if the relationship was significant but decreased, it was interpreted as partial mediator (Baron & Kenny, 1986).

Results

Results for Hypothesis (a)

The EFA resulted in a two-factor solution for the TSI, with the first factor representing Type I thinking styles (including legislative, judicial, global, and liberal styles) and the second factor representing Type II thinking styles (including executive, local, and conservative styles). The two factors accounted for 64.38% of the variance in the data (see Table 1). An EFA of the scales in the CFTIS also resulted in a single factor solution. Single type CFTIS (including independent, integration, motivation, judgment, flexibility, evaluation, question, opportunities, and frustration) was loaded onto the single factor. The single factor accounted for 65.96% of the variance in the data. Thus, hypothesis (a) was accepted. The MSA for the TSI was .79 and for the CFTIS was .94 (see Table 1). The internal consistency estimates (Cronbach's alpha) for Type I, Type II, and CFTIS scores were .82, .61, and .93, respectively. Zero-order and partial correlation analyses were conducted both after and before controlling the gender and age effects in order to see whether the relationships among the variables at hand significantly changed due to the possible effect of gender and age. Table 2 presents zero-order and partial correlation coefficients.

Table 1.
Factor Loadings for the Scales of TSI and CFTIS, (Teacher N=202)

Style or measures	Factor I	Factor II
TSI*		
Legislative	.71	
Executive		.59
Judicial	.88	
Global	.74	
Local		.72
Liberal	.78	
Conservative		.84
Eigenvalue	3.26	1.24
% variance	46.66	17.72
Cum. variance	46.66	64.38
Cronbach's *alpha*	.82	.61
CFTIS**		
Independent	.54	
Integration	.88	
Motivation	.79	
Judgment	.83	
Flexibility	.89	
Evaluation	.80	
Question	.82	
Opportunities	.82	
Frustration	.87	
Eigenvalue	5.93	
% variance	65.97	
Cum. variance	65.97	
Cronbach's *alpha*	.93	

*MSA for TSI .79, Bartlett's Test of Sphericity 463.74,p<.001
**MSA for CFTIS .94, Bartlett's Test of Sphericity 1319.88,p<.001
Variables with factor loadings of less than ±.45 have been omitted.

Table 2.
Zero-order and Partial Correlation Coefficients[a] (Teacher N=202)

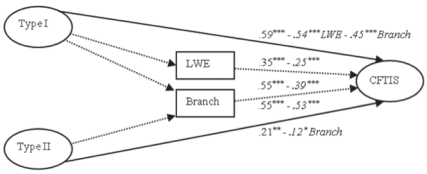
Variable	1	2	3	4	5	6
1.Gender	--					
2.Age	.13	--				
3.LWE	.01	.01	--			
4.Branch	.02	.11	.25*** *(.25***)*	--		
5.TypeI	.05	.05	.19** *(.19**)*	.34** *(.30***)*	--	
6.TypeII	.13	.11	.06 *(.06)*	.17* *(.15*)*	.43*** *(.43***)*	--
7.CFTIS	.04	.06	.35*** *(.35***)*	.55** *(.52***)*	.59*** *(.58***)*	.21** *(.22**)*

***p<.001;**p<.01;*p<.05

[a] *Zero-order correlations are outside the parentheses; whereas, those controlled for the gender and age partial correlations are in the parentheses and italics.*

Results for Hypothesis (b)

As can be seen in Table 2, there was a significant correlation between Type I, Type II and CFTIS. Thus, hypothesis (b) was partially accepted. Gender and age did not display significant correlation coefficients with Type I, II, and CFTIS. The branch where the teachers worked had a significant impact on the relationships between Type I, II, and CFTIS. On the other hand, LWE was found to have a significant relationship with the branch, Type I, and CFTIS, but was not significant with Type II thinking styles. With these findings, hypothesis (b) was rejected for gender and age; however, it was accepted for the branch of education and LWE. After controlling for gender and age, the correlation coefficients that are in italics and in parenthesis are significant (see Table 2). Thus, gender and age were removed from the final model. While only branch and LWE were counted in the final model, LWE was included in just Type I and CFTIS. Figure 2 presents the structural coefficients of the final model.



***p<.001, **p<.01, *p<.05

Figure 2.

The Final Model for Study 1: Type I= Thinking Styles (including legislative, judicial, global, and liberal styles), Type II=Thinking Styles (including executive, local, and conservative styles). CFTIS= Creativity Fostering Teacher Index Scale

Note: *Solid lines indicate direct effects whereas dashed lines indicate indirect effects. Parameter estimations are standardized values; italics are the parameter estimations regarding the indirect effect, the others are the parameter estimations regarding the direct effect.*

After controlling for gender, age, LWE, and for the branch effects on the variables, ANCOVA analyses were conducted to see whether the relationships among the variables at hand significantly changed due to the possible effect of gender, age, and LWE. The analyses that resulted showed that the branch effect was significant on Type I [$F_{(1,197)}$=20.00, p<.001,η^2=.18], on Type II [$F_{(1,197)}$=4.83, p<.05,η^2=.10], and on CFTIS [$F_{(1,197)}$=72.79, p<.001,η^2=.27]. The results were in favor of secondary school teachers for each of three variables. However, secondary school teachers tend to prescribe to Type I more than Type II. When the gender, age, and branch effects were held constant, the LWE variable demonstrated a significant effect on Type I [$F_{(2,196)}$=3.85, p<.05,η^2=.04], and on the CFTIS [$F_{(2,196)}$=12.23, p<.001,η^2=.11], but not on Type II [$F_{(2,196)}$=2.55, p>.05,η^2=.02]. For both the Type I thinking styles and CFTIS, the Bonferroni adjustment showing, multiple comparisons of marginal means, demonstrated significant difference between the teachers with more than 21 years of experience (LWE teachers) and the others. Actually, this revealed that experienced teachers have more Type I thinking styles and creativity-fostering teacher behaviors (see Table 3).

Table 3.
Means and Standard Deviations of Indicators by Gender, Age, LWE, and Branch (Teacher N=202)

Demographic traits			TSI scores Type I				CFTIS scores Type II	
		N	M	SD	M	SD	M	SD
Gender	Female	110	90.85	12.05	59.97	9.64	139.31	16.02
	Male	92	92.15	11.82	62.84	10.55	137.89	15.80
Age	20-30 years old	33	89.87	14.58	60.27	11.56	141.12	13.90
	31-40 years old	83	91.25	11.53	60.25	9.40	138.15	15.83
	41-50 years old	68	92.54	10.93	62.38	10.23	138.82	16.60
	51 years old or above	18	91.05	12.75	63.70	10.40	135.94	17.58
LWE	1-10 years	18	91.03	10.88	62.48	10.14	135.53	17.45
	11-20 years	42	87.59	11.64	58.59	8.84	132.03	15.75
	21 years or above	37	96.27	11.47	63.53	10.96	148.81	7.92
Branch	Elementary	90	86.93	11.91	59.33	9.40	128.96	16.74
	Secondary	112	95.07	10.69	62.84	10.49	146.46	9.77

Note: *TSI=Thinking Styles Inventory, CFTIS=Creativity Fostering Teacher Index Scale*

Results for the Hypothesis (c)

The hypothesized first model represented a bad fit (x^2=68.87, p<.001), and the other goodness of fit measures were also a bad fit with the data (RMR=12.80, RMSEA=.21, NFI=.73, TLI=.21, CFI=.74, GFI=.79, AGFI=.66). However, the final model represented a very good fit with the data (x^2=.14, p>.05). The other goodness of fit measures were very satisfactory (RMR=.24, RMSEA=.00, NFI=.99, TLI=1.00, CFI=1.00, GFI=1.00, and AGFI=.99). Type I thinking styles had a significant direct effect on CFTIS when the branch and LWE were held constant (β=.59, R^2=.35, p<.001). Similarly, Type II thinking styles had a significant direct effect on CFTIS when the branch was held constant (β=.21, R^2=.14, p<.01). Thus, hypothesis (c) was accepted. However, Type I had a stronger prediction on the CFTIS than the Type II. Table 4 presents unstandardized coefficients, standard errors, standardized regression weights, t-values and Sobel's z test results that belong to 4 models, not shown in Figure 2.

Results for Hypothesis (d)

While the direct effect of Type I thinking styles on CFTIS was β=.59, its indirect effect together with branch was β=.45, and when combined with LWE was β=.54. Similarly, while the direct effect of Type II thinking styles on CFTIS was β=.21, its indirect effect combined with branch was β=.12 (see Figure 2 and Table 4). Logistic regression analysis was conducted between independent and mediator variables. The relationships between Type I and Branch (-2 Log Likelihood= 228.86; Wald statistics = 20.87, $x^2_{(1)}$ = 24.58, p < .001), between Type I and LWE (-2 Log Likelihood= 207.98; $x^2_{(2)}$ = 20.87, p < .001), and between Type II and Branch (-2 Log Likelihood= 271.49; Wald statistics = 5.82, $x^2_{(1)}$ = 6.13, p < .05), were statistically significant in the model. The relationship between Type II and LWE (2 Log Likelihood= 201.26; $x^2_{(2)}$ = 10.19, was significant (p < .05), but for 1-10 years the Wald statistics = .32, and Goodness-of-fit = 101.30, the relationship was not found to be significant in the model (p > .05). Therefore, branch is a mediator between Type I, Type II and CFTIS, while LWE is a mediator only between Type I and CFTIS. Finally, a Sobel's z test was conducted for the significance of branch effect. Branch was found to be a significant mediator in the relationship between the Type I and CFTIS (z=3.83, p<.01), and between the Type II and CFTIS (z=4.47, p<.001). LWE was found to be a significant mediator in the relationship between

Table 4.
Summary of Regression Analysis

Model	Dependent variable	Independent variable	Level	B	S.E.	β	t	R^2	*Sobel's z*
1	CFTIS	Branch		17.49	1.88	.55	9.27^{***}	.30	--
Model summary: $F(1,201)=85.95^{***}$									
2	CFTIS	LWE		7.21	1.36	.35	5.28^{***}	.12	
Model summary: $F(1,201)=27.90^{***}$									
3	CFTIS	Type I	1	.78	.07	.59	10.38^{***}	.35	--
	CFTIS	Type I	2	.61	.07	.45	8.49^{***}	.40	3.83^{**}
		Branch		12.52	1.72	.39	7.26^{***}		
	CFTIS	Type I	3	.72	.07	.54	9.80^{***}	.41	2.43^{**}
		LWE		5.06	1.14	.25	4.42^{***}		
Model summary (first level): $F(1,201)=107.82^{***}$									
Model summary (second level): R^2_{change} =.15, $F(2,201)=94.30^{***}$									
Model summary (third level): R^2_{change} =.14, $F(2,201)=68.68^{***}$									
4	CFTIS	Type II	1	.33	.11	.21	3.06^{**}	.14	--
	CFTIS	Type II	2	.19	.09	.12	2.02^{*}	.35	4.47^{***}
		Branch		16.83	1.90	.53	8.85^{***}		
Model summary (first level): $F(1,201)=9.37^{**}$									
Model summary (second level): =.19, $F(2,201)=45.69^{***}$									

$^{***}p<.001$; $^{**}p<.01$; $^{*}p<.05$
Note: *Branch indicates elementary and secondary school teachers; LWE is 1-10 years, 11-20 years, 21 years and above*

the Type I and CFTIS (z=2.43, p<.01) (see Table 4). In light of these findings, the branch effect can be said to be a partial mediator in both relationships, whereas the LWE effect is a partial mediator in the relationship only between the Type I thinking styles and CFTIS. Ultimately, in this study, hypothesis (d) was rejected for gender and age; however, it was accepted for the branch and LWE.

Study 2

In Study 2, I included gender, age, and branch to test the relationship between thinking styles and the behaviors of creativity-fostering novice teachers, as well as to test the mediating role of the effects of these observed variables.

Hypotheses

Similar to Study 1, it is predicted that:

(a) While the TSI is a two-factor structure, the CFTIS is a single-factor structure.

(b) There are significant relationships among the Type I, Type II and CFTIS; and there are significant relationships between gender, age, branch, and Type I, Type II, and CFTIS.

(c) Type I thinking styles (including legislative, judicial, global, and liberal styles) and Type II thinking styles (including executive, local, and conservative styles) have direct effects on the CFTIS.

(d) Finally, these demographic traits are significant mediators on the relationships between the Type I, Type II, and the CFTIS.

Hypothesized Model

Again, to examine these relationships, a path model was proposed for all relationships between two latent variables (Type I and II thinking styles) and another latent variable (the CFTIS), as well as with significant relationships, with the predicted relationships, and for another with mediating role of three observed variables (gender, age, and branch) in these relationships. Refer to Figure 1 in Study 1 for details. The hypothesized model specified the same observed and latent variables, with the same parameter configuration as that of Study 1.

Method

Participants

The total number of participants consisted of 106 novice teachers. These novice teachers were enrolled in a 1-year postgraduate course in education. After the course, they would serve as expert teachers in elementary and secondary schools. These novice teachers were appointed to teach in the Niğde province in 2011 by the Turkish Ministry of National Education. The breakdown of the teachers' genders were as follows: 42.5% (f=45) were females and 57.5% (f=61) were males.

Elementary school teachers made up 34% (f=36) of the sample, while the secondary school teachers made up 66% (f=70). The majority of the secondary novice teachers were mathematics teachers making up 17.9% (f = 19) of the sample. The rest of the sample consisted of 11.3% (f=12) foreign language teachers, 8.5% (f=9) of Turkish language teachers and 7.5% (f=8) of science and technology teachers. The ages of the novice teachers ranged from 23 to 32 years. Only 2.8% (f=3) of them were above 30 years of age.

Instruments

The novice teachers provided basic demographic information like gender, age, school name, and branch. Similar to Study 1, two measures (TSI and CFTIS) were applied to the novice teachers.

Procedure

The TSI and CFTIS were administered to novice teachers in April and May of 2011. Participating novice teachers were selected on a voluntary basis for which legal permission was obtained from the Niğde Provincial Directorate of National Education on March 25, 2011. Novice teachers responded to the questions in the instruments, which took between 25 and 35 minutes to complete. They were also asked to provide basic demographic information such as gender, age, school name, length of work experience, and branch of study/education.

Data Analysis

An EFA was performed on the data collected from the novice teachers. The Varimax factor rotation technique was used in the analysis of the data. Cronbach's alpha coefficient was chosen as the internal consistency estimate. Both zero-order and partial correlation analyses were conducted in order to see whether there were significant relationships among the variables. Then, an ANCOVA analysis was conducted to determine whether there was a significant effect of demographic traits on the thinking styles and CFTIS. The SEM analysis and specifications in Study 1 were applied here. Linearity, multicollinearity, and singularity assumptions for SEM analysis were met. The multivariate kurtosis= .95 and critical ratio z= 2.01 (kurtosis for Type I= .05, Type II= .48, and CFTIS= .42 in absolute value) indicated that the data distributions were close to normal. Mahalanobis d^2 ranged from 2.47 to 11.45 (p >.05). Because of the large p-values of the Mahalanobis d^2, none of the observations under the assumption of normality should be treated as outliers. After six outliers were treated, no additional outliers were found. Thus, the maximum likelihood estimation in the SEM analysis was performed in this study, after the hierarchical and logistic regression analyses were conducted.

The preliminary analyses of the joint effects among predictor variables indicated that none of the interactions were significant. The *ps* was from .112 to .477 and η^2 was from .008 to .032 on Type I thinking style scores; *ps* was from .126 to .322 and η^2 was from .004 to .056 on Type II thinking style scores, and *ps* was from .190 to .556 and η^2 was from .007 to .039 on the CFTIS scores (a= .05). With these findings, the demographic traits (gender, age, and branch) were placed into the model of the hypothesis. Thus, no terms for predictor joint effects were included in the SEM model. The model was tested to ensure that the thinking styles influenced both directly and indirectly by the demographic traits predicted CFTIS. Sobel's z test was conducted to examine the significance of the mediating role of demographic traits in these relationships.

Results

Results for Hypothesis (a)

For the TSI, an EFA resulted in a two-factor solution, with the first factor representing Type I thinking styles (including legislative, judicial, global, and liberal styles) and the second factor representing Type II thinking styles (including executive, local, and conservative styles). The local term was style loaded on two factors (.43 and .62), but its factor loading in Factor II was higher than in Factor I. The two factors accounted for 62.60% of the variance in the data (see Table 5). An EFA of the scales in the CFTIS also resulted in a single factor solution. Single type CFTIS (including independent, integration, motivation, judgment, flexibility, evaluation, question, opportunities, and frustration teaching styles) was loaded on the single factor. The single factor accounted for 63.10% of the variance in the data. Thus, hypothesis (a) was accepted. The MSA for TSI was .74 and for CFTIS was .86 (see Table 5). The internal consistency estimates (Cronbach's alpha) for Type I, Type II, and CFTIS scores were .81, .60, and .87, respectively. Zero-order and partial correlation analyses were conducted both after controlling for gender, age, and branch effect, in addition to an uncontrolled test. This showed whether

the relationships among the variables at hand changed significantly due to the possible effect of gender, age, and branch. Table 6 presents the zero-order and partial correlation coefficients.

Table 5.
Factor loadings for the scales of TSI and CFTIS, (Novice Teacher N=106)

Style or measures	Factor I	Factor II
TSI*		
Legislative	.73	
Executive		.58
Judicial	.81	
Global	.85	
Local	.43	.62
Liberal	.76	
Conservative		.85
Eigenvalue	3.01	1.37
% variance	43.03	19.56
Cum. variance	43.03	62.60
Cronbach's alpha	.81	.60
CFTIS**		
Independent	.87	
Integration	.84	
Motivation	.63	
Judgment	.75	
Flexibility	.78	
Evaluation	.75	
Question	.69	
Opportunities	.77	
Frustration	.74	
Eigenvalue	5.67	
% variance	63.10	
Cum. variance	63.10	
Cronbach's alpha	.87	

**MSA for TSI .74, Bartlett's Test of Sphericity 219.77, p<.001*
***MSA for CFTIS .86, Bartlett's Test of Sphericity 405.83, p<.001*

Variables with factor loadings of less than ±.45 have been omitted.

Table 6.
Zero-order and Partial Correlation Coefficients[a] (Novice Teacher N=202)

Variable	1	2	3	4	5
1.Gender	--				
2.Age	.14	--			
3.Branch	.01	.00	--		
4.TypeI	.15	.05	.36** *(.37**)*	--	
5.TypeII	.15	.02	.13 *(.13)*	.29** *(.24*)*	--
6.CFTIS	.03	.00	.59*** *(.59***)*	.52*** *(.42***)*	.17* *(.09)*

****p<.001, **p<.01, *p<.05*
[a] Zero-order correlations are outside the parentheses whereas those controlled for gender and age partial correlations are in parentheses and italics.

Results for Hypothesis (b)

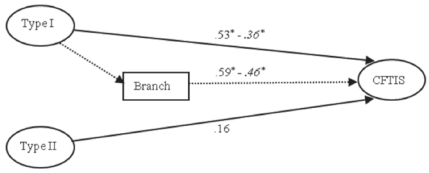
As a result of the zero-order correlation analysis, no significant correlations between gender, age, and branch were found. However, the branch showed significant correlation with the Type I thinking styles and CFTIS. Again, as a result of the zero-order correlation analysis, significant correlation was found only between Type I and CFTIS. When gender and age were held constant, a partial correlation analysis indicated a significant relationship between Type I and CFTIS, but not between Type II. Again, when gender and age were held constant, the branch still showed a significant correlation with Type I and CFTIS. With these findings, hypothesis (b) was rejected for gender and age (see Table 6). Therefore, only branch was included in the relationship between Type I and CFTIS for the final model. Figure 3 presents structural coefficients of the final model.

After controlling for gender and age effects, and for the branch effects on the variables, ANCOVA analyses were conducted in order to see whether the relationships among the variables at hand significantly changed due to the possible effect of gender and age. The analyses that resulted showed that branch had a significant effect on Type I [$F_{(1,102)}$=15.77, p<.001,η^2=.14] and on CFTIS [$F_{(1,102)}$=56.45, p<.001,η^2=.36], but not on Type II [$F_{(1,102)}$=1.92, p>.05,η^2=.02]. The ANCOVA analysis results were in favor of secondary school novice teachers in the relationship between Type I and CFTIS. These results suggest that secondary school novice teachers have more Type I thinking styles and creativity-fostering behaviors than elementary school novice teachers (see Table 7).

Table 7.
Means and Standard Deviations of Indicators by Gender, Age, and Branch (Novice Teacher N=106)

Demographic traits		TSI scores Type I			TSI scores Type II		CFTIS scores	
		N	M	SD	M	SD	M	SD
Gender	Female	45	88.31	13.22	58.04	11.30	137.11	12.78
	Male	61	91.98	10.14	61.36	9.66	137.88	11.70
Age	20-32 years old	106	90.42	11.63	59.95	10.47	137.55	12.12
	31-40 years old	36	84.63	9.49	58.02	8.63	127.52	11.16
Branch	Elementary	70	93.40	11.57	60.94	11.23	142.71	8.99
	Secondary	112	95.07	10.69	62.84	10.49	146.46	9.77

Note: *TSI= Thinking Styles Inventory, CFTIS= Creativity Fostering Teacher Index Scale*



*p<.001

Figure 3.

The Final Model for Study 2: Type I= Thinking Styles (including legislative, judicial, global, and liberal styles), Type II=Thinking Styles (including executive, local, and conservative styles). CFTIS= Creativity Fostering Teacher Index Scale

Note: *Solid lines indicate direct effects whereas dashed lines indicate indirect effects. Parameter estimations are standardized values; italics are the parameter estimations regarding the indirect effect, the others the parameter estimations regarding the direct effect.*

Results for Hypothesis (c)

The first model for the hypothesis in Study 1 represented a bad fit here (x^2=13.25, p< .05), and the other goodness of fit measures indicated a bad fit to the data (RMR=8.88, RMSEA=.10, NFI=.86, TLI=.78, CFI=.81, GFI=.86, and AGFI=.76. However, the final model represented a very good fit to the data (x^2=.09, p> .05). The other goodness of fit measures were very satisfactory; RMR=.49, RMSEA=.00, NFI=.99, TLI=1.00, CFI=1.00, GFI=1.00, and AGFI=.99. Type I thinking styles had a significant and direct effect on the CFTIS when the branch was held constant (β=.53, R^2= .28, p< .001). However, Type II thinking styles had no significant direct effect on the CFTIS when the branch was held constant (β=.16, R^2=.02, p> .05). Thus, hypothesis (c) was partially accepted. Type I was a strong predictor for the CFTIS, whereas, Type II was not. Table 8 presents unstandardized coefficients, standard errors, standardized regression weights, t-values and Sobel's z test results that belong to the three models, not shown in Figure 2.

Results for Hypothesis (d)

While the direct effect of Type I thinking styles on the CFTIS was β=.53, its indirect effect together with branch was β=.36 (see Figure 3 and Table 8). Logistic regression analysis was conducted between independent and mediator variables. The relationships between Type I and Branch (-2 Log Likelihood = 121.16; Wald statistics = 11.81, $x^2_{(1)}$ = 14.68, p< .01) were statistically significant in the model; whereas, the relationship between Type II and Branch (-2 Log Likelihood = 133.94; Wald statistics = 1.82, $x^2_{(1)}$ = 1.90, p> .05) was not found to be significant in the model. In this case, branch is a mediator between Type I and CFTIS. Finally, a Sobel's z test was conducted to determine the significance of branch effect. The teacher's branch was found to be a significant mediator in the relationship between Type I and CFTIS (z = 3.47, p< .001) (see Table 8). It can be said that the branch effect is a partial mediator in relationships between the Type I and the CFTIS. With these findings, hypothesis (d) was rejected for gender and age; however, it was accepted only for branch in the relationship between Type I and the CFTIS.

Study 3

In Study 3, I included gender, age and department to test the relationship between thinking styles and creativity-fostering behaviors of student teachers, as well as to test the mediating role of the effects of these observed variables.

Hypotheses

Similar to those in Study 1 and Study 2, it is predicted that:

Table 8.
Summary of Regression Analysis

Model	Dependent variable	Independent variable	Level	B	S.E.	β	t	R^2	*Sobel's z*
1	CFTIS	Branch		15.18	2.00	59	7.57*	.35	--
Model summary: $F(1,105)=57.34^{***}$									
2	CFTIS	Type I	1	.54	.08	.53	6.32*	.35	--
	CFTIS	Type I	2	.37	.08	.36	4.67*	.49	3.47*
		Branch		11.90	1.96	.46	6.07*		
Model summary (first level): $F(1,105)=39.99^{***}$									
Model summary (second level): R^2_{change} =.21, $F(2,105)=45.33^{***}$									
3	CFTIS	Type II		.18	.11	.16	1.67	.02	--
Model summary: $F(1,105)=2.80^{*}$									

***p<.001, **p<.01, *p<.05
Note: *Type I=Thinking styles (including legislative, judicial, global, and liberal styles), Type II=Thinking styles (including executive, local, and conservative styles). CFTIS=Creativity Fostering Teacher Index Scale.*

(a) While the TSI is a two-factor structure, the CFTIS is a single-factor structure.

(b) There are significant relationships among the Type I, Type II and CFTIS; and there are significant relationships between gender, age, department, and Type I, Type II and the CFTIS.

(c) Type I thinking styles (including legislative, judicial, global, and liberal styles) and Type II thinking styles (including executive, local, and conservative styles) have direct effects on the CFTIS.

(d) Finally, these demographic traits are significant mediators on the relationship between the thinking styles and the CFTIS.

Hypothesized Model

Again, to examine these relationships, a path model was proposed for all relationships between two latent variables (Type I and II thinking styles) and another latent variable (the CFTIS). This model was also proposed to show the significant relationships, the predicted relationships, and for another with mediating role of three observed variables (gender, age, and branch) in these relationships. Referring back to Figure 1 in Study 1, the branch was removed from Model 1, but department was included. The model for the hypothesis specified the same latent variables, with the same parameter configuration as that of Study 1 and Study 2.

Method

Participants

The total number of participants consisted of 246 student teachers from Niğde University's Faculty of Education. These student teachers are senior students (4th grade). No data was collected from freshmen, sophomore, and junior students because the senior students have done teaching practice in various primary schools and the others have yet completed this requirement. The student teachers were from a variety of departments focused on teaching including: elementary teaching (20.3%, f=50), Turkish language teaching (23.2%, f=57), social studies education (20.7%, f=51), science and technology education (13.8%, f=34), music education (11.4%, f=28), and visual arts education (10.6%, f=26). Of the total, 58.9% (f=145) were female and 41.1% (f=101) were male student teachers. Their ages ranged from 19 to 31 years. The average age in the sample was 22.07 and the standard deviation was 0.11. The majority of student teachers were aged between 21 and 23 years.

Instruments

The student teachers provided basic demographic information like age, gender, and department. Similar to Study 1 and Study 2, the two measures, TSI and CFTIS, were applied to the student teachers.

Procedure

The TSI and CFTIS were administered to the student teachers in May 2011. Participating student teachers were selected on a voluntary basis. The student teachers filled out the instruments, which took between 25 and 35 minutes to complete; they were also asked to provide basic demographic information such as gender, age, and department.

Data Analysis

An EFA was conducted on the data collected from the student teachers. The Varimax factor rotation method was used. Cronbach's alpha coefficient was chosen as the internal consistency estimate. Zero-order and partial correlation analyses were conducted in order to see whether there were significant relationships among the variables. Then, the ANCOVA analysis was conducted in order to see whether there was significant effect of the demographic traits on the thinking styles and CFTIS. The SEM analysis and specifications in Study 1 and Study 2 were applied here. The multivariate kurtosis = 3.49 and critical ratio z= 3.06 (kurtosis for Type I= 2.28, Type II= .51, and CFTIS= 1.69 in absolute value) indicated that the data distributions were close to normal. Mahalanobis d^2 ranged from 5.59 to 14.30 (p>.05). After eight outliers were treated, no additional outliers were found. Preliminary analyses of joint effects between gender and department indicated no interactions were significant. The *ps* was from .083 to .410, and η^2 was from .040 to .090 on Type I thinking styles scores; the *ps* was from .074 to .223, and η^2 was from .021 to .030 on Type II thinking styles scores; and the *ps* form was .081 to .780, and η^2 was from .010 to .132 on the CFTIS scores (a= .05). Thus, no terms for predictor joint effects were included in the SEM models. Thus, the maximum likelihood estimation was performed to explore the mediating role of demographic traits in the relationships between the thinking styles and CFTIS, after the hierarchical

and logistic regression analyses were conducted. The Sobel's *z* test was conducted to examine the significance of the mediating role of demographic traits in relationships between the thinking styles and CFTIS.

Results

Results for Hypothesis (a)

Table 9.
Factor Loadings for the Scales of TSI and CFTIS, (Student-teacher N=246)

Style or measures	Factor I	Factor II
TSI*		
Legislative	.69	
Executive		.69
Judicial	.85	
Global	.80	
Local	.41	.59
Liberal	.85	
Conservative		.79
Eigenvalue	3.21	1.22
% variance	45.91	17.48
Cum. variance	45.91	63.39
Cronbach's alpha	.83	.55
CFTIS**		
Independent	.66	
Integration	.79	
Motivation	.76	
Judgment	.72	
Flexibility	.70	
Evaluation	.67	
Question	.78	
Opportunities	.83	
Frustration	.85	
Eigenvalue	5.16	
% variance	57.39	
Cum. variance	57.39	
Cronbach's alpha	.90	

**MSA for TSI .77, Bartlett's Test of Sphericity 575.45, P<.001*
***MSA for CFTIS .93, Bartlett's Test of Sphericity 1123.75, P<.001*
Variables with factor loadings of less than ±.45 have been omitted.

For the TSI, an EFA resulted in a two-factor solution, with the first factor representing Type I thinking styles (including legislative, judicial, global, and liberal styles) and the second factor representing Type II thinking styles (including executive, local, and conservative styles). The two factors accounted for 63.39% of the variance in the data (see Table 9). The local style was two factor-loaded (.41 and .59), but its factor loading for Factor II was higher than in Factor I. An EFA of the scales in the CFTIS also resulted in a single factor solution. A single type CFTIS (including independent, integration, motivation, judgment, flexibility, evaluation, question, opportunities, and frustration teaching styles) loaded on a single factor. The single factor accounted for 57.39% of the variance in the data. Thus, hypothesis (a) was accepted. The MSA for TSI was .77 and for CFTIS was .93 (see Table 9). The internal consistency estimates (Cronbach's alpha) for the Type I, Type II, and CFTIS scores were .83, .55, and .90, respectively. The zero-order and partial correlation analyses were conducted both after controlling for gender, age, and branch effect, and then without controlling these variables, in order to see whether the relationships among the variables significantly changed due to the possible effect of gender, age, and branch. Table 10 presents the zero-order and partial correlation coefficients.

Table 10.
Zero-order and Partial Correlation Coefficients[a] (Student-teacher N=246)

Variable	1	2	3	4	5
1.Gender					
2.Age	.13				
3.Department	.01	.13			
4.TypeI	-.04	.03	.26** *(.26**)*		
5.TypeII	.04	.03	.14* *(.14*)*	.39** *(.40**)*	
6.CFTIS	-.11	.04	.27** *(.27**)*	.53** *(.53**)*	15* *(.16*)*

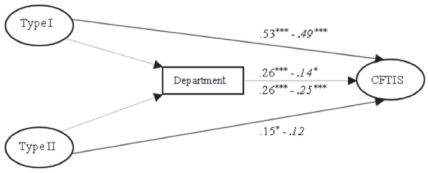
***p<.001, *p<.05*
[a] *Zero-order correlations are outside the parentheses whereas those controlled for the gender and age partial correlations are in parentheses and italics.*

Results for Hypothesis (b)

As a result of the zero-order correlation analysis, there were no significant correlations found between gender, age, and branch. However, branch displayed significant correlation with the Type I and II thinking styles and CFTIS. When gender and age were held constant, the partial correlation analysis found a significant relationship between Type I, II, and CFTIS. With these findings, hypothesis (b) was rejected for gender and age; however, it was accepted for branch, Type I, Type II, and CFTIS (see Table 10). Therefore, only branch was included in the relationship between Type I, II, and CFTIS for the final model. Figure 4 presents the structural coefficients of the final model.

After controlling for the effects of gender and age, the ANCOVA analyses for the branch effects on the variables were conducted in order to see whether the relationships among the variables had changed significantly due to the possible effect of gender and age. The resulting analyses showed that the branch effect was significant on Type I [$F_{(5,238)}$=7.56, p<.001,η^2=.14], on Type II [$F_{(5,238)}$=3.80, p<.01,η^2=.10], and on CFTIS [$F_{(5,238)}$=12.22, p<.001,η^2=.21]. The Bonferroni adjustment demonstrated that there were significant differences as visual arts student teachers were inclined toward

Type I, science and technology student teachers leaned toward Type II, Turkish language education, music education, and visual arts education student teachers favored CFTIS. The ANCOVA analysis results were showed the visual arts student teachers in favor of Type I and CFTIS, but the science and technology student-teachers were in favor of the Type II thinking styles. The results revealed that visual arts and Turkish language student teachers have more Type I thinking styles and creativity-fostering behaviors than the other student teachers. On the other hand, science and technology student teachers possessed more of the Type II thinking styles, but less creativity-fostering behaviors (see Table 11).



***p<.001, **p<.01, *p<.05

Figure 4.

The Final Model for Study 3: Type I= Thinking Styles (including legislative, judicial, global, and liberal styles), Type II=Thinking Styles (including executive, local, and conservative styles). CFTIS= Creativity Fostering Teacher Index Scale

Note: *Solid lines indicate direct effects whereas dashed lines indicate indirect effects. Parameter estimations are standardized values; italics are the parameter estimations regarding the indirect effect, the others are the parameter estimations regarding the direct effect.*

Table 11.
Means and Standard Deviations of Indicators by Gender, Age, and Department (Student-teacher N=246)

			TSI scores				CFTIS scores	
			Type I		Type II			
		N	M	SD	M	SD	M	SD
Gender	Female	145	91.72	12.62	59.93	9.89	135.68	13.80
	Male	101	90.47	13.12	60.87	10.66	132.09	16.79
Age	19-31 years old	246	91.21	12.82	60.32	10.20	134.21	15.17
Department	Elementary	36	85.10	13.87	60.12	10.21	123.12	16.38
	Turkish language	56	92.68	9.24	58.29	9.73	139.03	10.57
	Social studies edu.	48	91.41	12.31	57.31	9.56	136.52	12.04
	Science and tech.	48	88.64	13.10	65.85	9.30	128.67	17.02
	Music edu.	27	91.28	12.60	61.14	8.75	138.14	14.13
	Visual arts edu.	31	102.61	10.83	62.92	12.13	143.42	11.56

Note: *TSI= Thinking Styles Inventory, CFTIS= Creativity Fostering Teacher Index Scale*

Results for Hypothesis (c)

The hypothesized first model in Study 1 represented a bad fit (x^2=53.05, p< .05), and the other goodness of fit measures were also a bad fit to the data (RMR=13.65, RMSEA=.18, NFI=.67, TLI=.19, CFI=.67, GFI=.73, and AGFI=.77. However, the final model for Study 3 represented a very good fit for the data (x^2=.00, p> .05). The other goodness of fit measures were very satisfactory; RMR=.00, RMSEA=.31, NFI=1.00, TLI=1.00, CFI=1.00, GFI=1.00, and AGFI=1.00. Type I thinking styles had a significant direct effect on the CFTIS when the department was held constant (β=.53, R^2=.28, p< .001), and Type II thinking styles had a significant direct effect on the CFTIS when the department was held constant (β=.15, R^2=.03, p< .05). Thus, hypothesis (c) was accepted. However, Type I thinking styles were more powerful predictors on CFTIS than the Type II thinking styles. Table 12 presents unstandardized coefficients, standard errors, standardized regression weights, t-values and Sobel's z test results for the five models, not shown in Figure 4.

Results for Hypothesis (d)

While the direct effect of Type I thinking styles on CFTIS was β=.53, its indirect effect together with department was β=.49 (see Figure 3 and Table 8). In this case, department is a mediator between Type I and CFTIS. A Sobel's z test was conducted for determining the significance of department effect. The department was found as a significant mediator in the relationship between Type I and CFTIS (z=3.01, p<.01) (see Table 12). Therefore, the department effect is a partial mediator in relationships between the Type I and CFTIS. While the direct effect of Type II thinking styles on CFTIS was β=.15, its indirect effect together with department was β=.12 and not significant (see Figure 4 and Table 12). Logistic regression analysis was conducted involving the independent and mediator variables. The relationships between Type I and Department (-2 Log Likelihood = 441.70; $x^2_{(5)}$ = 40.35, p< .001), and between Type II and Department (-2 Log Likelihood = 421.25; $x^2_{(5)}$ = 19.52, p< .01) were found statistically significant in the model. Finally, a Sobel's z test was conducted for the significance of department effect. The department was found to be a significant mediator in the relationship between Type I and CFTIS (z = 1.98, p<.05) (see Table 12). This indicates that the department effect is a full mediator in relationships between Type II and CFTIS. With these findings,

Table 12.
Summary of Regression Analysis

Model	Dependent variable	Independent variable	Level	B	S.E.	β	t	R^2	*Sobel's z*
1	CFTIS	Department		2.49	.58	.26	4.28^{***}	.10	--
Model summary: $F(1,245)=94.61^{***}$									
2	CFTIS	Type I	1	.62	.06	.53	9.72^{***}	.28	--
	CFTIS	Type I	2	.58	.06	.49	8.84^{***}	.30	3.01^{**}
		Department		1.26	.52	.14	2.41^{*}		
Model summary (first level): $F(1,245)=94.61^{***}$									
Model summary (second level): $R^2_{change}=.12$, $F(2,245)=51.15^{***}$									
3	CFTIS	Type II	1	.22	.09	.15	2.40^{*}	.03	--
	CFTIS	Type II	2	.17	.09	.12	1.88	.10	1.98^{*}
		Department		2.33	.58	.25	3.99^{***}		
Model summary (first level): $F(1,245)=5.77^{*}$									
Model summary (second level): $R^2_{change}=.07$, $F(2,245)=45.33^{***}$									

$^{***}p<.001$, $^{**}p<.01$, $^{*}p<.05$
Note: *Type I=Thinking styles (including legislative, judicial, global, and liberal styles), Type II=Thinking styles (including executive, local, and conservative styles). CFTIS=Creativity fostering teacher index scale.*

hypothesis (d) was rejected for gender and age; however, it was accepted for department involving relationships between the Type I, II, and CFTIS.

General Discussion

This paper aimed to examine the mediating role of Turkish teachers' gender, age, and branch/department on their thinking styles and creativity-fostering behaviors. To achieve this goal, three exploratory studies were designed. The factor structures in the three studies were basically consistent with the hypothetical basis for Type I and Type II thinking styles (e.g. Sternberg, 1997; Zhang, 2001c, 2002a, 2004a, 2008; Zhang & Sternberg, 2000). However, Zhang (2003) has reported otherwise. Type I and Type II thinking styles were clearly separate in Study 1. However, the factor loadings of the present study are not similar in magnitude to Zhang's (2008).

In Study 2 and 3, the local style was located under both Factor 1 and Factor 2. However, the factor loadings of the local style under Factor 2 were higher than that under Factor 1. For this reason, the local style was accepted in the Type II thinking style. The present result is consistent with the findings of Zhang and Sternberg (2002), who also found that the local style loaded highly on the two factors, with loadings of .21 and .74, respectively. Again, the present result is consistent with findings of Fan and Ye (2007), with loadings of .53 and .56. In the three studies examined in this paper, CFTIS was under a single factor as hypothesized. In fact, it seems reasonable as all sub-scales of CFTIS include creativity-fostering teacher behaviors. No negative sub-scales were found.

Zero-order and partial correlation analyses demonstrated non-significant relationships between gender, age, Type I, Type II, and CFTIS, while the branch demonstrated significant relationships between the Type I and II thinking styles, and CFTIS and the LWE demonstrated significant relationships between the Type I and CFTIS. For this reason, gender and age were omitted from the final models. On the other hand, it is not parallel with some research findings that indicate a significant relationship between thinking styles and gender (Balkıs & Işıker, 2005; Başol & Türkoğlu, 2009; Çubukçu, 2005; Fan & Ye, 2007; Yıldızlar, 2010, 2011; Zhang, 1999), although it is parallel to another research finding (Saracaloğlu et al., 2008). However, in a different study, Tatar and Emmanuel (2001) found significant differences between female and male teachers in their attitude-behavior comparisons. The present findings are also not parallel with the findings of previous research that found a significant relationship between thinking styles and age (i.e., Balkıs & Işıker, 2005; Başol & Türkoğlu, 2009; Çubukçu, 2005; Fan & Ye, 2007; Sternberg, 1988, 1997; Zhang, 1999). Actually, the older teachers generally have more work experience. Considering the results, the non-significant correlation between the LWE and Type II is not similar to the results in the literature (i.e., Fan & Ye, 2007; Sternberg & Grigorenko, 1995; Zhang, 1999; Zhang & Sternberg, 2002; Zhu & Zhang, 2011). In the literature, older teachers were found to be more executive, local, and conservative than younger teachers (Sternberg & Grigorenko, 1995; Zhang & Sternberg, 2002). In this study, the Type I thinking styles were most utilized by the teachers who had worked for 21 years or more. This finding

is not in line with Zhang's findings (2001c; 2002a; 2008). Similarly, in a different study, Baloğlu and Karadağ (2009) found significant relationships between professional work experience and constructive thinking, and their results were in favor of less experienced teachers. The branch effect on the Type I and Type II teaching styles leaned toward secondary school teachers. However, secondary school teachers favored Type I thinking styles rather than Type II. This finding is contrary to those findings in previous research (Fan & Ye, 2007; Sternberg & Grigorenko, 1995), because teachers were found to be more legislative but less executive at the lower grades than in the upper grades.

The findings in these three studies reveal that there is no significant relationship between the gender of Turkish teachers and their creativity-fostering behaviors in class. Yet, Soh (2000) found significant differences in favor of female teachers for the CFTIS, and found significant differences between Chinese and Non-Chinese teachers. The results of Saban (2003) indicate that significant differences exist between male and female Turkish prospective teachers' preconceptions of the teaching profession. Present findings also reveal an non-significant correlation between CFTIS and age. As a result of the ANCOVA analysis of Study 2, Type I and CFTIS, the findings showed that secondary school novice teachers were more likely to ascribe to the Type I thinking styles. In Study 3, the results of the ANCOVA analysis showed a positive correlation between Type I and CFTIS with visual arts and Turkish language student-teachers, the results for Type II showed an inclination toward science and technology student teachers. The findings of Study 3 revealed that visual arts and Turkish language student teachers possess more Type I thinking styles and creativity-fostering behaviors. On the other hand, science and technology student teachers have more Type II thinking styles, but have less creativity-fostering behaviors. Similarly, Blomberg, Stürmer, and Seidel (2011) found evidence for different professional visions among German pre-service teachers majoring in different fields (mathematics/science and social sciences/humanities). However, the CFTIS indicated a positive correlation with teachers who had worked for over 21 years, in addition to a correlation with secondary school teachers. The experienced teachers and secondary school teachers have more behaviors fostering creativity than the others. Most likely, these findings are due to Turkey's teacher training system. As explained before, the teacher-training curricula in Turkey is predetermined and the programs are centrally controlled (Dikici, 2009; Saban, 2003). A new primary school curricula was implemented in all primary schools in Turkey in 2005, and the curricula are based on the constructivist learning approach. All teachers were trained to put the curriculum into practice properly. The new curriculum covers teachers' behaviors, fostering students' creativity and the methods of instruction and evaluation. Therefore, the new curriculum may favor experienced teachers and secondary school teachers. This result is not parallel with the findings of the studies in different fields. Randall & Engelhard (2009) found that elementary school teachers assigned higher grades than did their middle school counterparts.

Results of a SEM analysis represented a very good fit to the data of the final models whereas the hypothesized first model represented a bad fit. The SEM analysis supports the hypothesis regarding relationships between thinking styles and the CFTIS. Type I and Type II thinking styles had direct, significant and positive effects on the CFTIS. However, Type I was more powerful in predicting CFTIS than Type II. This result was parallel with the findings of previous research (Zhang, 2007; Zhang & Sternberg, 2005, 1997; Zhu & Zhang, 2011). Zhang (2008) found relationships between Type I thinking styles and Type I teaching styles. Type I thinking styles tend to be creativity generating (Zhang, 2007; 2008), as it was shown that the democratic behaviors of teachers towards students support the development of student creativity (Erdogdu, 2006), and Type I thinking styles were associated with nurturing the creativity of students (Zhu & Zhang, 2011). Similarly, Üredi and Üredi (2007) found significant relationships between TSI and TPPI. Finally, it was revealed that the branch was a partial mediator in relationships between Type I and II thinking styles, and CFTIS. While this result for the branch completely supports Yıldızlar's findings (2011), it partially supports the findings of Saracaloğlu et al. (2008). However, LWE was a partial mediator in the relationship between Type I thinking styles and CFTIS only. In the findings of Study 3, the effect of department was significant on CFTIS. Therefore, there was a partial mediating role of the department effect in the relationship between the Type I thinking styles and CFTIS, but a full mediating role in the relationship between the Type II thinking styles and CFTIS.

Based on the results of these three studies, it may be said that the secondary school teachers integrate more creativity-fostering behaviors

than the elementary school teachers do, and more experienced teachers have more creativity fostering behaviors than the inexperienced teachers do. Differences between the creativity-fostering behaviors of male and female teachers are were not observed. Experienced teachers can mentor inexperienced teachers on creativity-fostering behaviors. For the development of student creativity, the attitudes and practices of teachers in the classroom and outside the classroom are very important. Zhang's (1999) findings show the importance of students' participation in school and extracurricular activities for the development of creative-thinking styles. However, mentoring to novice teachers is different from that of the other teachers. According to Giebelhaus and Bowman (2002), mentoring to novice teachers is a critical issue in teacher education in the United States. However, mentoring only lasts for one year for novice teachers in Turkey. Experienced and qualified teachers are assigned to novice teacher for mentoring. This one-year period of mentoring may be insufficient for novice teachers. Whereas, student teachers can be trained about incorporating creativity fostering teacher behaviors in faculty of education. Consequently, there is potential for a special place in teacher education on thinking styles and creativity fostering teacher behaviors.

Limitations and Potential for Further Study

The present study indicates three limitations that will guide further studies. First, the participants (teachers and novice teachers) in this study are from a small city in Central Anatolian Turkey with a population of 115, 000. Studies involving teachers working in bigger cities could yield different results. Moreover, comparisons could be made between cities in western and eastern areas Turkey, in the east, the lifestyle of Turkish people is more closely related to Middle-eastern and Asian culture, while in the west it is more closely related to European culture. Second, the data of student teachers were obtained from one university. Although the university is highly representative of the Turkish teacher training system, the enrollment of the university is relatively limited when compared with other Turkish universities. Further studies should be conducted based on a larger number of student teachers recruited from more than one university in order to provide more comprehensive results. The sample consisted of prospective teachers in several education areas (e.g., elementary school teaching, and secondary school Turkish language teaching, social studies education, science and technology education, music education, and visual arts education). Thus, the results of the present study cannot be generalized to other areas of education. Other areas of education such as physical education and teaching related to sports, preschool teaching and special education (i.e., gifted students education, learning disabilities education) should also be included in the sample of future research. Third, the present data were based on self-report measures. The participants' responses to the items on creativity-fostering teacher behaviors may reflect their aspirations about the teaching profession instead of their actual intentions. Consequently, possible effects of social desirability may need to be controlled in future studies.

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