WORK PERSONALITY TYPES AND PRE-SERVICE MATHEMATICS TEACHERS' REASONS FOR CHOOSING MATHEMATICS TEACHING

by

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ABSTRACT

WORK PERSONALITY TYPES AND PRE-SERVICE MATHEMATICS TEACHERS' REASONS FOR CHOOSING MATHEMATICS TEACHING

The present study aims to investigate the personality types and the reasons of Turkish pre-service mathematics teachers for choosing mathematics teaching and examines differences according to gender and level of teaching of the participants. It is also aimed to determine if there is a relationship between the personality types and reasons for choosing mathematics teaching. The participants of this study are 384 senior pre-service mathematics teachers from 9 universities in Turkey. The aim of the present study was threefold. First one was to examine the reasons given by Turkish pre-service mathematics teachers for choosing teaching as a career through demographic characteristics (gender and level of teaching) of the participants. Among participants, altruistic social utility reasons (*enhance social equity, make social contribution, and shape future of children and adolescents)* was the highest rated category of reasons. On the other hand, the *fallback* reason category was rated lowest. The second purpose was to examine the work personality types of Turkish pre-service mathematics teachers based on Holland's (1997) work personality types theory through demographic characters (gender and level of teaching). *Social* personality type category was rated highest which is consistent with the theory. *Investigative* work personality type was rated second highest while the *enterprising* category was rated lowest. The analysis showed that, women have significantly higher scores on artistic work personality type, while men have significantly higher score on realistic work personality type. Moreover, secondary mathematics pre-service teachers have significantly higher score on investigative work personality type compared to primary pre-service mathematics teachers. The third aim was to determine if there is a relationship between the reasons and work personality types of the Turkish pre-service mathematics teachers. *Social utility values* reasons were found to be highly related with *social* work personality type.

ÖZET

MATEMATİK ÖĞRETMEN ADAYLARININ MESLEKİ KİŞİLİKLERİ VE MATEMATİK ÖĞRETMENLİĞİNİ SEÇME NEDENLERİ

Bu araştırmada matematik öğretmen adaylarının mesleki kişiliklerini ve matematik öğretmenliğini seçme nedenlerini araştırılırken; aynı zamanda, cinsiyet, bölüm (ilköğretim matematik öğretmenliği, ortaöğretim matematik öğretmenliği) bazında farklılıklar da incelenmiştir. Bunlara ek olarak, mesleki kişilik ile matematik öğretmenliğini seçme nedenleri arasındaki ilişki de araştırılmıştır. Bu araştırmaya Türkiye'deki 9 üniversiteden toplam 384 ilköğretim ve ortaöğretim matematik öğretmeni adayı katılmıştır. Bu araştırmanın amacı 3 boyutludur. İlk amacı, matematik öğretmenlerinin, matematik öğretmenliği kariyerini seçme nedenlerini araştırıp, cinsiyet ve bölüm farklarını incelemektir. Katılımcıların matematik öğretmenliğini seçmedeki en etkili nedenleri *toplumsal eşitliği arttırmak, çocukların/gençlerin geleceklerini şekillendirmek* gibi *sosyal sorumluluk nedenleri* olurken, katılımcılar en düşük puanı matematik öğretmenliğini yedek plan olarak seçme kategorisine vermişlerdir. Araştırmanın ikinci amacı, Holland'ın (1997) meslek seçim teorisi ışığında Türk matematik öğretmenlerinin mesleki kişiliklerini araştırıp, cinsiyet ve bölüm farklarını incelemektir. Teoriyle tutarlı olarak katılımcılar genel olarak *sosyal,* sonra *araştırmacı* kişilik tipinde çıkmıştır. Katılımcılar arasında en düşük kişilik tipi ise *girişimcidir*. Kadın katılımcılar artistik tipte erkeklerden anlamlı şekilde daha yüksek puan alırken, erkek katılımcıların ise gerçekçi kişilik tipindeki puanı kadınlara göre anlamlı şekilde yüksek çıkmıştır. Ayrıca araştırmacı kişilik tipinde ortaöğretim matematik öğretmenliği bölümündeki katılımcıların puanı, ilköğretim matematik öğretmenliğinde okuyan katılımcılara göre anlamlı olarak yüksek çıkmıştır. Araştırmanın üçüncü amacı ise katılımcıların mesleki kişilik tipleri ile matematik öğretmenliğini seçmeleri arasındaki ilişkiyi araştırmaktır. Sosyal kişilik tipi ile toplumsal eşitliği arttırmak, çocukların/gençlerin geleceklerini şekillendirmek, topluma katkıda bulunmak yüksek oranda ilişkili bulunmuştur.

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LIST OF ACCRONYMS/ABBREVIATIONS

PMATH	Primary Mathematics Education
SMATH	Secondary Mathematics Education

1. INTRODUCTION

There has been a vast amount of research both internationally and locally investigating who chooses teaching and the reasons behind their decisions for choosing teaching as a career (Bastick, 2000; Hao & Guzman, 2007; Reid & Caudwell, 1997; Wang & Fwu, 2001). One of the motivations behind these studies might be the lack of quantity and quality in teaching profession all around the world (Hatsor, 2012; United Nations Educational Scientific and Cultural Organization Institute for Statistics [UNESCO], 2006). Supplying and sustaining high-quality teachers has been a challenge for policymakers and authorities in different countries (Organization for Economic Co-operation and Development [OECD], 2005). Eurydice also reported that out of 32 European education systems 14 had a teacher shortage (Eurydice, 2002). According to global projections from the UNESCO Institute for Statistics (2013);

> "Chronic shortages of teachers will persist beyond 2015 for decades to come if current trends continue. In total, the world will need an extra 3.3 million primary teachers and 5.1 million lower secondary teachers in classrooms by 2030 to provide all children with basic education. (p.1)"

Furthermore, having a teacher shortage is only one side of the problem. The analysis shows that teacher quantity and teacher quality problems are clearly connected (OECD, 2005). In the OECD report, Teachers Matter: Attracting, Developing and Retaining Effective Teachers, teacher quality problem reflects trends in the composition of the teacher workforce in terms of academic background, gender, knowledge and skills as well as quantity was emphasized (OECD, 2005). According to OECD's (2005) report;

> "There are two broad concerns about the supply of teachers. One relates to teacher numbers: many countries are either currently experiencing, or will shortly face, a quantitative shortage of teachers. The other concern is more qualitative, and reflects trends in the composition of the teacher workforce in terms of academic background, gender, knowledge and skills. (p.39)"

Even though teaching would seem to be a career considered central to a country's development and well-being; recently metropolitan countries and developing countries

experience the problem of supply and sustain of a high qualified and motivated teacher workforce (Watt, Richardson, Klusmann, Kunter, Beyer, Trautwein & Baumert, 2012). For instance, in the United States, poor teacher quality is a rising concern. People who choose teaching in the U.S. is from the bottom two-thirds of college students, and, for many schools in poor neighborhoods, this ratio is the bottom third (Auguste, Kihn & Miller, 2010; Akiba, Baker, Goesling & Letendre, 2002). While academically stronger students tend to avoid the teaching profession; teachers who have the lowest scores on standardized tests are the most likely to remain in the profession (Hess, 2004). Similarly, in many of the European countries such as Norway, Italy, Sweden and Ireland, to hire fully qualified teachers is considered difficult by policy makers (see OECD, 2005; Ireland Chief Inspector's Report, 2012).

Teachers' dropout rates or low motivated teachers in schools is another problem for U.S. and many European countries (Hao & Guzman, 2007; OECD, 2005). Holland (1997) indicated that in order for an individual to be successful and stable at his/her job, it is necessary that an individual's interests and personality type is congruent with their job. It is reasonable to claim that teaching as a profession requires certain personal characteristics to deal with the school and classroom problems and help students learn (Tun, 2009). Various studies showed that teachers who are dedicated to their jobs have personality characteristics such as outgoing, warm, caring, friendly and social (Holland, 1997; Ryans, 1960; Teven, 2007). Thus, personality type might be another indicator of a dedicated teacher. In order to attract not only high quality candidates but also dedicated ones who have suitable personal characteristics into teaching, decision makers need to have a better understanding of the characteristics of future teachers and what motivates them to choose teaching as a career (Guarino, Santibafie & Daley, 2006).

Another incentive to investigate the personality types and reasons of teachers to choose teaching as a career might be building effective teacher education programs which fit the characteristics and motivations of future teachers (Aksu, Daloğlu, Demir, Kiraz & Yıldırım, 2010). Policy makers all around the world try to improve their schools in order to respond to higher social and economic expectations and technological developments (World Bank, 2005). Teachers as the most significant and costly resource in schools are central to school improvement efforts and teacher quality is considered the most important

school variable among the factors that influence student learning and achievement (OECD, 2005). Since today's pre-service teachers will have a significant influence on the education of future generations; it is crucial to understand who chooses teaching and their motivation in choosing teaching. Because, in order for a teacher education system to be effective, it needs to identify the characteristics and motivations that pre-service teachers bring with them when they enter teacher education programs (Şaban, 2003). Once these characteristics are recognized, enhanced curricula can be developed which may better address the needs and motivations of pre-service teachers (Coultas & Lewin, 2002).

In Turkey, there is no teacher shortage; in fact, the number of graduates from teacher training programs is two times higher than the number of teachers that Turkish government can hire (Ministry of National Education Projection, 2013). However, it does not necessarily mean that the quality of the teaching workforce is adequate (OECD, 2005). Turkey is one of the countries which are at the bottom of the ranking in international standardized tests such as Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS). Since teacher expertise is one of the most important factors in determining student achievement (OECD, 2005), low achievement of Turkish students in those tests may point out to low quality of teachers in Turkey (Kılınç, Richardson& Watt, 2012). Particularly, in developing countries such as Turkey which has a different age profile from other members of OECD because of the number of the growing population; there is an increasing need for high quality teachers to educate these young people (Aksu *et al.*, 2010).

Mathematics teaching is particularly important in Turkey, because with the technological developments, there is an increasing need for the quality in mathematical domains resulted with the requirement of the qualified mathematics teachers (Kılınç *et al.*, 2012). Because of the young population profile, and policies to accelerate economic development, Turkey need to ameliorate the quality of the teaching workforce in mathematics related areas. In order to fulfill the plans of a technological revolution and economic development, today's children and adolescents should not be demotivated and deterred from mathematical career fields by low quality teachers (Kılınç *et al.*, 2012). Mathematics teachers' motivations and reasons to choose their profession may be critical if policy makers want to effectively educate a new generation who are mathematically

literate (OECD, 2005) and their policies must address both teacher quantity and quality (UNESCO, 2006).

Therefore, the aim of the present study is to examine the personality types and the reasons of Turkish pre-service mathematics teachers for choosing mathematics teaching and investigate differences according to gender and level of teaching. It is also aimed to determine if there is a relationship between the personality types and reasons of the participants.

2. REVIEW OF THE LITERATURE

In order to have a better understanding of why mathematics teachers choose teaching as a profession, it is important to begin with understanding the theoretical frameworks that explain factors influencing people's work choices in general. This chapter reviews the theories and research that are relevant with the present study under five main sections: (i) Career decision-making, (ii) Holland's theory of vocational personality types, (iii) Teachers' reasons for joining teaching profession, (iv) Demographic characteristics of teachers, (v) Mathematics teachers' reasons for choosing teaching as a profession.

2.1. Career Decision-making

Understanding the part of work in people's lives has been crucial for applied psychologists. The factors influence people while deciding to pursue a particular career have long been investigated by vocational and behavioral psychologists because work is an important part of human functioning (Fouad, 2007; Kılınç *et al.*, 2012). Young people's personal characteristics, self-efficacy, interests, abilities, beliefs, perceptions as well as advice and opinions of family and friends, job opportunities, social and economic background can play a part in directing the career decision-making process (Bandura, 1986; Holland, 1997; Super, 1963). There are many theories that describe the factors influence career choices (Okoye, Nwadinigwe & Chikelu, 2013). Researchers examining these factors have focused on support for three major theoretical models: Super's life-span career theory, social cognitive career theory models and Holland's theory of vocational personality types (Fouad, 2007).

Super (1963) explained a career as a sequence of occupations held during the lifetime, including also both prevocational and postvocational activities. According to Super and his colleagues, as they grow, people develop a self-concept which is a personal image of their own abilities, personal characteristics, values, roles and beliefs (Super, Savickas & Super, 1996). Individuals then choose their career by comparing their self-concept with what they know about the occupations and trying to fit their self-concept into an occupational area (Savickas, 1997). According to Super's life-span theory, self-concept changes over time and develops as a result of experience so does career development.

Self-efficacy is another important factor that influences individuals' decisions about their careers (Hackett & Betz, 1981; Lent, Brown, Sheu, Schmidt & Brenner, 2005). Career-related self-efficacy may be defined as "an individual's confidence in ability to complete tasks necessary to enter an occupational area or to make a career-related decision" (Fouad, 2007, p.549). Lent and Brown's (1996) theoretical model of career choice and performance is derived from Bandura's (1986, 1997) social cognitive theory and focuses on the role of self-efficacy in career development. Gainor and Lent (1998) suggest that there are three aspects of career development: interests, career choice options, and performance. Persistence in educational and occupational options is influenced by individuals' self-efficacy and outcome expectations. Therefore self-efficacy has indirect as well as direct influences on the career path because it predicts interests, which predict one's career choices, and therefore predict level of satisfaction and performance (Lent *et al.*, 2005). Thus, in terms of career choice, a person decides to pursue a certain career because one feels confident in that area; this confidence eventually results in the interest of the individual in that area (Tang, Fouad & Smith, 1999).

On the other hand, results of various studies showed that individual differences and personality types may be influential on career decision making process (e.g., Arroba, 1977; Deng, Armstrong & Rounds, 2007; Dinklage, 1968; Harren, 1979; Gencür, 2011). These studies on individual differences in career decision-making processes concentrate on classifying individuals into categories of *decision-making styles* based on the most dominant characteristic that they have in the decision-making process.

Among the theories that emphasis on the individual differences on career choices, one of the most widely used and well-respected theoretical model is Holland's theory of vocational personality types which describes work choices in terms of personality types (Fouad, 2007; Holland, 1997; Toomey *et al.*, 2009). His theory has been supported by researchers in different cultural contexts (e.g., Çevik & Perkmen, 2010; Deng *et al.*, 2007; Tak, 2004; Soh & Leong, 2001).

2.2. Holland's Theory of Vocational Personality Types

According to Holland (1997), individuals make their career decisions due to their work personality types. Individuals can be classified according to one or a combination of six different themes that catch some characteristics of work personality and these themes are referred by the acronym RIASEC (realistic, investigative, artistic, social, enterprising, and conventional) as shown in Figure 2.1. Holland (1997) suggests that vocational interests are organized according to the hexagonal model, which simplifies individuals' attempts in the career decision making processes by matching their occupational interests to their vocational personality types. Holland's hypothesis states that in the RIASEC hexagonal model; adjacent types are most related, alternate types have an intermediate relationship while opposite types are the least related.

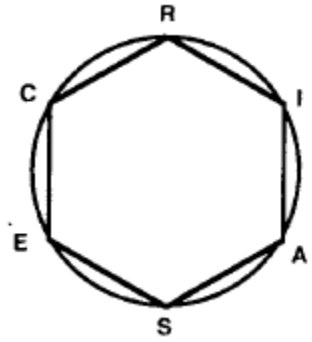

Figure 2.1. Holland's Hexagonal Model (RIASEC: realistic, investigative, artistic, social, enterprising, and conventional).

As stated by Holland (1997), each personality type represents a synthesis of preferences for work and other individual differences characteristics:

2.2.1. Realistic

Realistic people are independent, stable, persistent, practical, and thrifty. They prefer to deal with things rather than ideas or people. They are doers and good at tasks that are tactile, physical, athletic, or mechanical. An individual with *realistic* interests enjoys working outdoors, controlling mechanical devices, to be involved with animals and plants,

and performing physical activities. Moreover, *realistic* people may want to work in environments where the reward system is material. On the other hand *realistic people* may not like working as members of the teams where they need to have close interaction with other people. Electricians, carpenters, drivers and athletes may be examples of people with *realistic* work personality type.

2.2.2. Investigative

Investigative people are intellectual, introspective, and inquisitive. They are curious, methodical, rational, analytical, and logical and good at tasks that are scholarly, scientific, technical or medical. Individuals with *investigative* interests like to deal with complex mathematical and scientific problems and like solving them mentally. *Investigative* people may appreciate intellectual knowledge; however they may be lacking in interpersonal skills. Computer programmers, researchers, mathematicians and engineers may be examples of people with *investigative* work personality type.

2.2.3. Artistic

Artistic people are creative, intuitive, sensitive, articulate, and expressive. They rely on feelings, imagination, and inspiration. They are good at tasks that are literary, verbal, visual, and aesthetic. Artistic people may enjoy environments without flexible rules where people can be more able to feel free and express their ideas and emotions. Artistic individuals may lack in performing routine jobs or working in environments that are hierarchical with established rules and regulations. Architects, writers, actresses/actors and designers may be examples of people with *artistic* work personality type.

2.2.4. Social

Social people are kind, generous, cooperative, patient, caring, helpful, empathetic, tactful, and friendly. They are good at socializing, helping others, and teaching. *Social* individuals may also like to be involved in volunteer work. They may enjoy working environments where a lot of human interactions take place on the other hand; they may not like to deal with mechanical tools or technical activities. Teachers, nurses, psychological counselors and babysitters may be examples of people with *social* work personality type.

2.2.5. Enterprising

Enterprising people are adventurous, ambitious, assertive, extroverted, energetic, enthusiastic, confident, and optimistic. They are good at business, politics, public speaking, and salesmanship. An individual with *enterprising* interests may like leading groups, involving with risky situations, making decisions, having control of organizations. They may pursuit material success and prestige. An individual with e*nterprising* interests may enjoy business related jobs; however, dislike dealing with scientific subjects or working in an area where they would not be able to influence other people. Administrators, CEOs and event planners may be examples of people with *enterprising* work personality type.

2.2.6. Conventional

Conventional people are logical, efficient, orderly, and organized. They are thorough and detail-oriented. They value precision and accuracy. They are good at accounting, statistics, computers, data analysis and clerical tasks. A person with *conventional* interests may enjoy dealing with routine jobs which have clear rules and procedures. Conventional people may like to follow the directions and work in hierarchical organizations; but, dislike working in environments with no clear rules or regulations. Accountants, database administrators, statisticians and data analysts may be examples of people with *conventional* work personality type.

Fouad (2007) discussed that Holland's work personality types theory has been investigated in various countries on almost every continent of the world such as Korea (Tak, 2004), Japan (Tracey *et al.,* 1997), India (Leong *et al.,* 1998), Singapore (Soh & Leong, 2001), China (Tang, 2001, Yang *et al.*, 2005), and Turkey (Çevik & Pekmen, 2010; Gencür, 2011). In those countries, men and women's interests were significantly different (Fouad, 2007). Women tend to express more interest in people-oriented occupations such as *social* ones; while men tend to be more interested in things-oriented occupations such as *realistic* ones (Su *et al.*, 2009).

According to Holland (1997), just like individuals, occupations also have RIASEC (realistic, investigative, artistic, social, enterprising, conventional) types. Moreover, Holland (1996) stated that in order for an individual to be successful and stable in an environment, it is necessary that one work in an environment that is congruent with one's

own work personality type. As mentioned in a previous paragraph; teaching is characterized in the *social* work personality type according to Holland (1997).

2.2.7. Teachers' Vocational Personality Types

Teaching profession requires certain personal characteristics such as helping, outgoing, warm and caring (Holland, 1997; Ryans, 1960; Teven, 2007). Dedicated teachers deal with the school and classroom problems with the help of their interpersonal skills and social characteristics (Tun, 2009). Holland's vocational personality types theory places teachers in the *social* vocational personality type. Holland (1997) claims that *social* people choose activities which involve working with people and interaction by educating, informing, curing, or enlightening those people.

There are various studies conducted in order to determine work personality types of teachers based on Holland's vocational personality types (see Çevik& Pekmen, 2010; Gencür, 2011; Swanson, 2008). Swanson (2008) studied with 82 in-service foreign language teachers based on Holland's work personality types. Participants ranked *social, artistic* and *enterprising* domains highest, whereas *investigative* and *realistic* domains lowest respectively. In Çevik and Pekmen's (2010) study with 99 pre-service music teachers *artistic, social* and *conventional* domains were ranked highest by the participants, whereas the *investigative* domain was ranked lowest. Although there are various studies on teachers' work personality types, there is not much information about how personality types and teachers' reasons for choosing teaching are related.

Gencür (2011) investigated 518 Turkish pre-service primary mathematics teachers' work personality types according to Holland's (1997) vocational personality types theory. Gencür (2011) assigned a letter of RIASEC (*realistic, investigative, artistic, social, enterprising* and *conventional*) to each participant based on their highest scored category. Then he examined the frequencies of the work personality types of the participants. In his study, 53% of the participants were in the *social* domain and 20% of them were in the *investigative* domain. On the other hand, *enterprising* and *realistic* domains were the lowest rated domains among participants.

2.3. Teachers' Reasons for Joining Teaching Profession

Recently, many countries have been experiencing problems with teacher recruitment and retention (Hao & Guzman, 2007). The number of people who choose teaching as a career is decreasing; on the other hand the number of teachers who sign off in their first three to five years is increasing (OECD, 2005). In order to understand if policy makers use the proper incitements to attract teachers, it is crucial to understand the reasons why young people chooses the teaching profession and what makes them stay or leave. Even though in Turkey, there is no teacher shortage, to know why people prefer to be teachers, may help enhancing teacher education programs and increase the quality of teaching workforce (Aksu *et al.*, 2010). For all those reasons, it is important to understand the reasons of teachers for choosing their profession.

Many studies have tended to classify the reasons for choosing to be teachers (e.g., Bastick, 2000; Moran, Kilpatrick, Abbot, Dallat, & McClune, 2001; Soh, 1998; Wang & Fwu, 2001). Over the past four decades, researchers have put emphasize on similar reasons in different classifications and combinations for choosing teaching as a career (Watt & Richardson, 2007). According to Moran *et al.* (2001), based on previous research on motivations for entering the teaching profession, pre-service teachers' reasons for entering teaching mostly fall into three main categories: *intrinsic reasons* (e.g., having a strong interest on the subject matter/love to teach), (2) *altruistic reasons* (e.g., wanting to make a positive impact on young people's lives), and (3) *extrinsic reasons* (e.g., salary/summer holidays). Brookhart and Freeman (1992) highlighted intrinsic, extrinsic, and altruistic motivations as the most important groups of reasons based on their meta analysis of studies that used participant rankings of the various reasons for choosing teaching as a career.

2.3.1. Intrinsic Reasons

Intrinsic reasons may be described as job-related factors; for example, the nature of the job which provides opportunities for lifelong learning or the coherence of a person's interest and the job (Low, Lim, Ch'ng & Goh, 2010). Intrinsic reasons include the interest for the teaching itself, such as the desire to work with children, interest in teaching or the subject matter knowledge. Some of the intrinsic reasons given by teachers that are mentioned in various studies may be counted as following: interested in teaching, teaching as a childhood dream, job satisfaction, sense of achievement, love of their subject,

enjoyment of working with children (Hao & Guzman, 2007; Reid & Caudwell, 1997; Watt & Richardson, 2007).

Richardson and Watt (2006) studied with 1653 Australian freshman pre-service teachers from various disciplines and the highest rated motivations of participants for choosing teaching was intrinsic such as considering themselves as able to teach well, believing that they would find teaching an intrinsically rewarding job and they will have enjoyable and positive learning experiences themselves. In Sinclair's (2008) study with 211 pre-service teachers, intrinsic reasons were rated as the most influential and "working with children was the top reason.

Low and his colleagues' (2010) findings also suggest that pre-service teachers choose teaching mostly for intrinsic reasons. In their study with 1064 pre-service teachers, "interest in teaching" was the most popular reason, cited by a quarter of the pre-service teacher respondents (25.1%). Based on the review of 50 related studies, Edmonds, Sharp, and Benefield (2002) concluded that pre-service teachers are attracted to the profession largely for intrinsic reasons. It is also important to indicate that; those who are committed to teaching are tend to be motivated by intrinsic reasons (Hao & Guzman, 2007; Zimmerman & Martinez-Pons, 1990).

2.3.2. Altruistic reasons

Altruistic reasons can be described as social motivations such as making a difference in the lives of young people, being a good role model, a desire to help children succeed, and a desire to contribute society to improve (Kyriacou, 1998). Many studies with the pre-service teachers that were conducted in different countries around the world (e.g., Allard, Bransgrove, Cooper, Duncan, & MacMillan 1995; Kyriacou, Hultgren& Stephens, 1999; Reid & Caudwell, 1997; Şaban, 2003) indicate that altruistic reasons are highly influential for pre-service teachers to choose teaching.

In Şaban's (2003) study with 381 pre-service elementary teachers, most of the participants rated the altruistic reasons as the most important (69%). "I want to contribute to the future of society" and "I want to help children learn and succeed in school." were the two top reasons that were given by participants. Kyriacou *et al.* (1999) also studied with

112 British pre-service teachers and "I want to help children succeed" was received the highest rating by 92% of the participants.

2.3.3. Extrinsic Reasons

Extrinsic reasons cover dimensions of the job that are not connected with the nature of the job itself, rather motivated by external factors such as salary and long holidays. Have a steady source of income, ensure a stable job, earn a living, support my family, get employed immediately, ensure a high-paying job, flexible hours and long vacations are also extrinsic reasons given by teachers.

Although, literature shows that pre-service teachers are mostly motivated by intrinsic and altruistic reasons (Hao & Guzman, 2007; Low *et al.*, 2010; Reid & Caudwell, 1997; Watt & Richardson, 2007), there are also studies which found that extrinsic reasons are influential in choosing teaching as a profession. For instance, in Bastick's (2000) study with 1444 Jamaican pre-service teachers, extrinsic motivation was the most important factor. 24.2% of the participants indicated that they choose teaching for extrinsic reasons while 14.6% for altruistic and 8.8% for intrinsic reasons. In Papanastasiou and Papanastasiou's (1998) study with 157 pre-service teachers from University of Cyprus, the factor "variety of benefits" was rated as the most influential for choosing teaching as a career. The factor includes items such as "teachers are employed immediately after graduation", "teaching is a secure job", and "teachers have long vacations".

Even though, most of the studies tend to group reasons under three main categories as intrinsic, extrinsic and altruistic (Brookhart & Freeman, 1992; Low et.al, 2010; Moran et.al, 2001); "various operationalization of intrinsic, extrinsic, and altruistic motivations have resulted in a lack of definitional precision and overlapping categorizations from one study to another" (Richardson & Watt, 2006). In some studies, the same reasons have been classified under different categories (e.g., Yong, 1995, Younger, 2004). In order to have definitional precision and an agreed-upon analytical and theoretical framework; Watt and Richardson (2007) developed a systematic approach, FIT-Choice, to teaching as a career choice. In other words, their approach elaborates the three reason categories from the literature (intrinsic, altruistic, and extrinsic) and also insert new categories such as social influence and prior teaching and learning experiences.

2.3.4. Factors Influencing Teaching Choice (FIT-Choice) Model

FIT-Choice model was developed by Watt and Richardson (2007) and includes 12 motivation categories for choosing teaching as a career. These categories are *teaching abilities, intrinsic value, fallback, job security, time for family, job transferability, shape future of children/adolescents, enhance social equity, make social contribution, work with children/adolescents, prior teaching and learning experiences and social influences*. Job security, time for family and job transferability categories together form the *personal utility values* category. *Shape future of children/adolescents, enhance social equity, make social contribution,* and *work with children/adolescents* categories together form the *social utility values* category. These categories are shown in Figure 2.2.

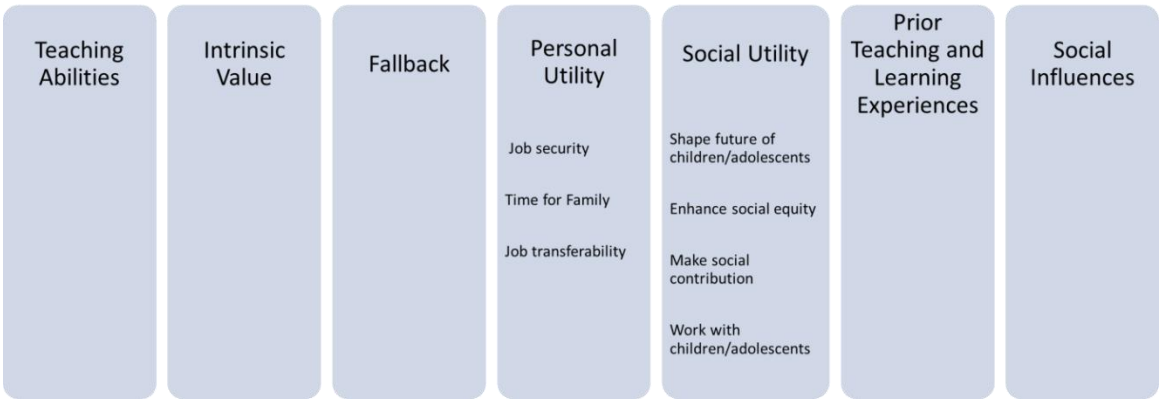

Figure 2.2. Reason Categories of FIT Choice Model.

Teaching abilities category includes teachers' perceptions of their own abilities to teach. "I have the qualities of a good teacher" and "Teaching is a career suited my abilities." are the example statements for this category. *Intrinsic values* category includes the interest in and love for the characteristics that come from the nature of the job. "I like teaching", "I have always wanted to be a teacher" are the example statements for this category. *Fallback* category includes reasons of choosing teaching as a second choice rather than voluntarily. "I was unsure of what career I wanted", "I was not accepted into my first-choice career" are the example statements for this category. *Personal utility values* category includes extrinsic reasons that are not connected with the nature of the job itself, rather with the external factors such as salary and long holidays for choosing teaching. *Personal utility values* category has 3 subcategories which are *job security (*e.g. "Teaching

will offer a steady career path."), *time for family* (e.g. "Teaching hours will fit in family commitments") and *job transferability (*e.g. *" A teaching job will allow me to choose where I wish to live.")*. *Social utility values* category includes altruistic reasons and has 4 subcategories which are *shape future of children/adolescents (*e.g. *"*Teaching will allow me to shape child/adolescent values*"), enhance social equity* (e.g. "Teaching will allow me to work against social disadvantage"), *make social contribution* (e.g. "Teaching enables me to 'giveback' to society") and *work with children and adolescents* (e.g. "I want to work in a child/adolescent-centered environment"). *Prior teaching and learning experiences* category includes the reasons connected with the positive experiences from teachers' past like a good teacher model. "I have had inspirational teachers", "I have had positive learning experiences" are the example statements for this category. *Social influences* category includes the reasons related with the guidance and support of other people for an individual to become a teacher. "My friends think I should become a teacher", "My family think I should become a teacher" are the example statement for this category.

The FIT-Choice model was used in various studies in different countries and each gave a different highlight. In the initial FIT-Choice study with 1653 Australian pre-service teachers, the highest rated motivations for teaching were perceived teaching abilities, the intrinsic value of teaching, the desire to make a social contribution, shape the future and work with children/adolescents and the lowest rated motivation was choosing teaching as a 'fallback' career (Watt & Richardson, 2007). In the comparison study between China and the United States, researchers found similar and different initial motivations to teach between samples of 257 pre-service teachers from a university in the U.S. and 542 from another university in China. The U.S. pre-service teachers stated significantly higher motivations from social utility values, teaching abilities, intrinsic career value, and prior teaching and learning experiences; the Chinese pre-service teachers revealed higher fallback career motivations (Lin, Shi, Wang, Zhang, & Hui, 2012). In their study, Fokkens-Bruinsma and Canrinus (2012) studied with freshmen (N = 62) and senior (N = 89) Dutch pre-service teachers. These senior pre-service teachers rated social influences and teaching ability motivations as more important, suggesting possible changes in motivations through teacher education. Relationship between teaching motivations and commitment to the profession were also examined and significant motivational predictors for commitment

were found to be teaching ability, working with children, prior teaching and learning experiences, and time for family.

In an international study with pre-service teachers from Australia (N=1438), US (N= 511), Germany (N=210) and Norway (N=131); same five motivations were rated highest in all four countries. These factors were intrinsic value, perceived teaching ability, the desire to make a social contribution, to work with children/adolescents and having positive prior experiences of teaching and learning. On the other hand, social influences of friends, family, and co-workers were rated the least influential (Watt, Richardson, Klusmann, Kunter, Beyer, Trautwein & Baumert, 2012).

In Turkish study with 1577 pre-service early childhood, primary and secondary teachers; highest rated motivations were social utility values (make social contribution, shape future of children/adolescents, enhance social equity) (Kılınç *et al.,* 2012). Science-related teacher candidates scored higher on fallback career, and were lower on almost all other teaching motivations, demonstrating a less positive motivational profile (Kılınç *et al.,* 2012). Since this was a large scale study with pre-service teachers from many different domains, the researchers did not report results for mathematics teachers separately.

2.4. Demographic Characteristic of Teachers

Most of the research shows that the reasons given by teachers for choosing their profession differ according to demographic characteristics of the teachers such as gender, socioeconomic status, and sociocultural context (Chuene, Newson & Lubben, 1999; Hao & Guzman, 2007; Holland, 1997; Kyriacou *et al.,* 1999; Richardson & Watt, 2006).

2.4.1. Gender

Teaching has always been an attractive career for considerable numbers of women all around the world (Richardson & Watson, 2007). In Europe, female teachers dominated the teaching workforce, particularly in Bulgaria, Estonia, Lithuania, the Slovak Republic and Slovenia and the ratio is very high as 80 - 85% (OECD, 2009). In Canada 74% of public school teachers are female (Kamanzi, Riopel, Lessard, 2007); while in the U.S. the number is 84% (Feistritzer, 2011). Gender ratio in teaching profession also varies due to level of education. Average percentages of women among school teachers by level of education in OECD countries are as follows: 97.1% for pre-primary level, 82% for primary

level, 68.1% for lower secondary level, 59.4% for upper secondary level (OECD, 2009). In Turkey, female teacher ratio is 50.3% of total teaching workforce. The percentages by level of education are 95.2% for pre-primary level, 52% for primary level and 42.9% for upper secondary level (OECD, 2009).

Female and male pre-service teachers' reasons for choosing teaching as a career mostly differ in terms of their motivations (Şaban, 2003; Hao & Guzman, 2007; Watt, Shapka, Morris, Durik, Keating, & Eccles, 2012). Şaban (2003), in his study about reasons of pre-service primary teachers to teach, found that female teacher candidates tend to be more altruistically and intrinsically motivated towards becoming a primary teacher than their male peers. In their study, Hao and Guzman (2007) found that gender is an important factor on pre-service teachers' reasons to choose teaching. In order to explain the pre-service teachers' reasons, Hao and Guzman (2007) developed 8 factors that are categorized as idealistic (teaching is a highly noble profession with a very worthy cause), migratory (the chance to explore the globe in search of greener pastures), developmental (teachers' desire for the fullest development of their potential and life's essential skills), employment security and stability (regard teaching as a job guaranteed to be readily available and dependable at all times), supremacy (power, popularity, and competitive advantage), liberating (set people free from the bondage of uncertainty and ignorance), altruistic (humane intentions and selfless motives), and perpetual (desire to make themselves seen as teachers who create an everlasting impact on the lives of people). Idealistic and perpetual reasons are found to be more dominant among the female (62.5%) than the male (49.4%) respondents. Whereas, liberating reasons have stronger motivation in men (94%) than in women (93.2%). Edmonds, Sharp and Benefield's (2002) findings also suggests that people with different profiles are motivated by different reasons such as male pre-service teachers placed more emphasis on extrinsic factors compared to female ones. Thus, studies show that females are motivated by more intrinsic and altruistic reasons compared to male participants who are motivated by more extrinsic reasons.

2.4.2. Socioeconomic Status

Most of the studies that investigate characteristics of entering teachers show that pre-service teachers were likely come from middle income families (Aksu *et al.,* 2010; Brookhart& Freeman, 1992; Coultas & Lewin, 2002; Richardson & Watt, 2006). The socioeconomic status and family backgrounds of pre-service teachers vary country to country; however, the general conclusion is ‘‘entering teacher candidates typically come from homes where socio-economic status is not as high as that of college students in general’’ (Brookhart & Freeman, 1992, p. 46). Studies that were conducted in Turkey reveal similar results in terms of educational backgrounds of parents of entering student teachers (Aksu *et al.,* 2010). People, who choose teaching in Turkey, usually come from families with middle to low socioeconomic status level in which only the father has a paid job (Şaban, 2003). Turkish pre-service teachers' fathers appear to have higher educational qualifications than mothers; with most fathers either high school or university graduates and most mothers either primary or high school graduates (Başaran, 2004; Kılınç *et al.,* 2012; Şaban, 2003). In his study, Başaran (2004) found that most of the fathers of pre-service teachers are employed in the public institutions, whereas the mothers are mostly housewives.

Reasons of teachers for choosing teaching differ according to socioeconomic status of individuals (Şaban, 2003). Altruistic reasons are greater among pre-service teachers whose parents' education stops at the primary level (Hao & Guzman, 2007). Weiner (1993), in her study, found a "socio-economic" demographic difference in terms of motivations for teacher trainees. According to her findings, pre-service teachers from a small urban public college have more extrinsic reasons to become a teacher compared to trainees at the Harvard Graduate School of Education. Compared to Harvard students, Urban College students gave higher ratings to the importance of salary and job security, while Harvard students gave higher ratings to independence and autonomy, desire to change society, desire to meet people of different social backgrounds, the suitability of the academic calendar, and the length of the school year (Weiner, 1993).

On a macro level socio cultural context may be another variable that influence teachers' career decisions. Studies that were conducted in the developed countries such as United States, Singapore and Australia asserted that altruistic, service-oriented reasons

(e.g. make a social contribution) and intrinsic reasons (e.g. intellectual fulfillment) are the primary reasons given by pre-service teachers for choosing teaching as a career (Kyriacou & Coulthard, 2000; Moran, Kilpatrick, Abbott, Dallatt, & McClune, 2001; OECD, 2005; Richardson & Watt, 2006); while studies conducted in developing countries which have different sociocultural characteristics such as in Brunei (Yong, 1995), Zimbabwe (Chivore, 1988), Cameroon (Abangma, 1981), Jamaica (Bastick, 2000) and Cyprus (Papanastasiou & Papanastasiou, 1998) have found that more extrinsic motivations such as flexible work hours, long vacations, job security, and salary are important reasons for choosing to enter teaching profession.

2.4.3. Level of teaching (primary vs. secondary)

Primary and secondary pre-service teachers show differences in terms of their reasons for choosing teaching as a profession (Book & Freeman, 1986). These differences between those pre-service teachers may be based on their depth of area expertise and level of ease of accessibility to alternative career options (Richardson & Watt, 2006). Secondary teachers, especially ones whose majors are high demand areas such as science, mathematics may consider a greater range of alternative career possibilities. In fact, once qualified, more highly skilled mathematics and science graduates have been shown tendency to switch their careers, because they can earn higher salaries in other occupations such as engineering (Richardson & Watt, 2006).

Book and Freeman (1986) found that primary pre-service teachers' reasons for choosing teaching as a career tended to be more altruistic while secondary candidates were more likely to be interested in teaching because of their desire to teach subject matter. Secondary pre-service teachers were also more likely to consider teaching as a stepping stone to alternative careers. On the other hand, Watt and Richardson (2007) stated that teaching level had no relationship with the categories of reasons (intrinsic, extrinsic, and altruistic). Because, the previous studies revealed contradictory results about the differences between primary and secondary pre-service teachers' reasons for choosing teaching as a career, this point needs to be investigated more.

2.5. Pre-service mathematics teachers' reasons for choosing teaching as a profession

Mathematics is usually seen as an area that is hard to learn and causes anxiety for some students. Since teacher quality is accepted as one of the most important factors for student learning, having qualified and committed mathematics teachers in schools is crucial for students to be mathematically literate (OECD, 2005; Kılınç *et al.,* 2012). However, recruiting qualified mathematics teachers is a growing problem for many policy makers in different countries (Richardson & Watt, 2006; Kılınç *et al.*, 2012). Another problem is that qualified and high skilled pre-service mathematics teachers seek other career options that they can earn higher salaries when they graduate (Richardson & Watt, 2006).

While some studies show that mathematics teachers are motivated by more extrinsic reasons (Chuene *et al.,* 1999) others show that reasons given by mathematics teachers are mostly intrinsic (Dawson, 2007; Kyriacou & Kobori, 1998).Teachers who are willing to teach is mostly give intrinsic and altruistic reasons rather than extrinsic, so it is important to understand the reasons of pre-service mathematics teachers' for choosing teaching as a career, in order to have an understanding of future's mathematics teachers profile. Chuene and his colleagues (1999), in his study, interviewed with 34 pre-service and novice mathematics teachers and found that most frequent reasons given by teachers were extrinsic. In the study with 1577 Turkish pre-service teachers; science-related pre-service teacher participants scored higher on fallback career, and were lower on almost all other teaching motivations, demonstrating a less positive motivational profile (Kılınç *et al.,* 2012).

Jarvis and Woodrow (2005) investigated the reasons of 483 pre-service teachers. The reasons were broadly divided into two categories as "vocational commitment" and "career related reasons". Students with mathematics major have the least percentage of giving vocational commitment (22%). Dawson (2007), on the other hand, interviewed with 150 students whose major are mathematics/science and found that most frequent answers given by students to become teacher was "Want to make a difference" (altruistic). He also asked what are these students reasons for being a mathematics/science teachers and most frequent answer was "Love science/mathematics" (intrinsic).

Some research reveal that pre-service mathematics teachers' motivations tend to be extrinsic so, they have a different situation from teachers of other areas in terms of reasons for choosing teaching as a career (e.g., Chuene *et al.*, 1999). On the other hand, others found that intrinsic and altruistic reasons such as "love of the subject" and "want to make a difference" are influential for pre-service mathematics teachers' career decisions (e.g., Dawson, 2007; Kyriacou & Kobori, 1998). All these controversial results from studies bring the need for a further research to understand the reasons of pre-service mathematics teachers' reasons for entering profession and factors which may influence these reasons.

3. SIGNIFICANCE OF THE STUDY

In most of the countries, there is a concern about the shortage of qualified applicants to teacher programs (Kyriacou *et al.*, 1999; OECD, 2005). Teachers' low motivation and dedication is another problem for many countries (Hao & Guzman, 2007; OECD, 2005). Studies showed that teachers who are dedicated to their jobs have personality characteristics such as social, caring and friendly (Holland, 1997; Ryans, 1960; Teven, 2007). Hence, personality type of teachers may be an indicator of a dedicated teacher. In order to attract not only high quality candidates but also dedicated ones who have suitable personal characteristics into teaching, decision makers need to have a better understanding of the characteristics of future teachers and what motivates them to choose teaching as a career (Guarino, Santibafie & Daley, 2006). This is also important in order to build an effective teacher education programs which fit the characteristics and motivations of future teachers (Aksu *et al.*, 2010). Since teachers are the most significant and costly resource in schools and they are central to school improvement efforts; it is crucial to understand who chooses teaching and their reasons for choosing teaching (Şaban, 2003; World Bank, 2005).

In Turkey, there is no teacher shortage; however the quality and dedication of teachers are rising concerns (Kılınç *et al.*, 2012). Mathematics teachers are particularly important for Turkey, because with the rapid technological development, there is an increasing need for the quality in mathematical domains resulted with the requirement of the dedicated and qualified mathematics teachers (Kılınç *et al.*, 2012). Although there are various studies on teachers' personality types and their reasons for choosing teaching (Gencür, 2011; Tun, 2009; Cortis, 1973; Ryans *et al.*, 1960), there is not much information about how personality types of teachers relate with their reasons for choosing teaching. This relationship may give a wider perspective for the answers of the questions who chooses teaching and why they do so. There are also few studies that specifically investigate the reasons of Turkish pre-service mathematics teachers.

Hence, the purpose of the present study is to examine the personality types and the reasons of Turkish pre-service mathematics teachers for choosing mathematics teaching and investigate differences according to gender and level of teaching. It is also aimed to

determine if there is a relationship between the personality types and reasons for choosing mathematics teaching.

4. STATEMENT OF THE PROBLEM

The present study investigates the work personality types and reasons of Turkish pre-service mathematics teachers to choose teaching as a profession and examines the differences according to demographic characteristics of the participants.

4.1. Variables

There are three major variables of this study which are work personality types, reasons for choosing mathematics teaching and demographic characteristics of participants. There are three variables (gender, level of teaching and socioeconomic status) considered under demographic characteristics of pre-service teachers. However, the collected data from the participants' self-reports was not sufficient to analyze socioeconomic status. Thus, the socioeconomic status was excluded from independent variables of the current study.

- *Work Personality Types* is defined under six different categories which are referred by the acronym RIASEC (realistic, investigative, artistic, social, enterprising, and conventional). Work personality types was measured by the Turkish adaptation of Holland's SDS/Self-Directed Search Scale (Holland, 1997) adapted by Gencür (2011).
- *Reasons for choosing mathematics teaching* are classified under 13 categories. These categories are *teaching abilities, intrinsic value, fallback, job security, time for family, job transferability, shape future of children/adolescents, enhance social equity, make social contribution, work with children/adolescents, prior teaching and learning experiences and social influences* and *interest in mathematics*. Interest in mathematics category was added later by the researcher of this study for the purpose of this study. The procedure of adding the new category will be explained in the "Methods" section (5.2.2. Factors Influencing Teaching Choice Scale (FIT)). Reasons of pre-service mathematics teachers for choosing teaching was measured by Turkish adaptation of Factors Influencing Teaching Choice Scale (FIT choice) developed by Richardson and Watt (2006) and adapted to Turkish by Kılınç (2012).

- *Level of Teaching Mathematics* is the level of pre-service mathematics teachers as primary or secondary. It was measured by self-reports of participants on the demographic survey.
- *Gender* is defined as the state of being male or female. It was measured by self-reports of the participants on the demographic survey.

4.2. Research Questions

The study emphasizes on the following research questions.

(i) What are the work personality types of Turkish pre-service mathematics teachers as measured by SDS scale?

(ii) Is there any significant difference of Turkish pre-service mathematics teachers' work personality types according to their gender?

(iii) Is there any significant difference of Turkish pre-service mathematics teachers' work personality types according to level of teaching (primary mathematics teaching and secondary mathematics teaching)?

(iv) What are the reasons given by Turkish pre-service mathematics teachers for choosing teaching as a career as measured by FIT choice scale?

(v) Is there any significant difference of Turkish pre-service mathematics teachers' reasons for choosing teaching as a career according to their gender?

(vi) Is there any significant difference of Turkish pre-service mathematics teachers' reasons for choosing teaching as a career according to level of teaching (primary mathematics teaching and secondary mathematics teaching)?

(vii) Is there any significant relationship between pre-service mathematics teachers' work personality types and their reasons for choosing teaching as a career?

4.3. Statement of the Research Hypothesis

In the present study it is hypothesized that:

(i) There is a significant difference of Turkish pre-service mathematics teachers' work personality types according to their gender.

(ii) There is a significant difference of Turkish pre-service mathematics teachers' work personality types according to their level of teaching (primary mathematics teaching and secondary mathematics teaching).

(iii) There is a significant difference of Turkish pre-service mathematics teachers' reasons for choosing teaching as a career according to their gender.

(iv) There is a significant difference of Turkish pre-service mathematics teachers' reasons for choosing teaching as a career according to their level of teaching (primary mathematics teaching and secondary mathematics teaching).

(v) There is a significant relationship between pre-service mathematics teachers' work personality types and their reasons for choosing teaching as a career.

5. METHOD

In this section the characteristics of the participants and instruments will be represented. Furthermore, the data collection and data analysis will be explained.

5.1. Sample

The target population of the present study is Turkish pre-service mathematics teachers. The participants of this study are senior pre-service mathematics teachers from universities in Turkey which have both primary and secondary mathematics education departments.

In Turkey, there are 14 universities which have both primary and secondary mathematics education departments together. These universities accept students based on their university entrance exam scores. Names of those universities with their primary and secondary mathematics education entrance scores, their city and region information is shown in Table 5.1. Request to conduct research sent to all of the 14 universities. Data was collected from 9 universities whose instructors agreed to collaborate in research. Then instructors administered the instruments to volunteered pre-service teachers. In total, 384 preservice teachers (275 female and 109 male) from 9 of those 14 universities formed the sample of the current study. The detailed differentiation of participants according to their gender, universities and departments are demonstrated in Table 5.2.

Table 5.1. Universities that have both secondary and primary mathematics education departments in Turkey.

University	Entrance scores of PRED	Entrance scores of SCED	City	Region
Boğaziçi Üniversitesi	509,228	520,865	İstanbul	Marmara
Hacettepe Üniversitesi	485,082	459,868	Ankara	İç Anadolu
Marmara Üniversitesi	484,291	499,615	İstanbul	Marmara
Gazi Üniversitesi	475,611	489,579	Ankara	İç Anadolu
Dokuz Eylül Üniversitesi	470,359	492,615	İzmir	Ege
Balıkesir Üniversitesi	446,084	474,616	Balıkesir	Marmara
Ondokuz Mayıs Üniversitesi	438,234	466,274	Samsun	Karadeniz
Karadeniz Teknik Üniversitesi	425,323	458,562	Trabzon	Karadeniz
Dicle Üniversitesi	425,022	412,288	Diyarbakır	Güneydoğu Anadolu
Selçuk Üniversitesi	422,775	470,552	Konya	İç Anadolu
Cumhuriyet Üniversitesi	421,322	400,061	Sivas	İç Anadolu
Atatürk Üniversitesi	407,313	438,295	Erzurum	Doğu Anadolu
Yüzüncü Yıl Üniversitesi	398,378	398,083	Van	Doğu Anadolu
Başkent Üniversitesi	224,193	300,671	Ankara	İç Anadolu

Table 5.2. Number of Participants.

University	Primary Mathematics Education		Secondary Mathematics Education		Total
	Female	Male	Female	Male	
Boğaziçi	6	-	13	8	27
Marmara	34	6	-	-	40
Karadeniz Teknik	44	14	13	10	81
Dicle	-	-	18	15	33
Necmettin Erbakan	35	11	21	10	77
Cumhuriyet	-	-	29	8	37
Atatürk	27	11	-	-	38
Yüzüncü Yıl	5	5	8	8	26
Başkent	18	2	4	1	25
Total	169	49	106	60	384

5.2. Instruments

5.2.1. Self-Directed Search Scale (SDS)

The Self-Directed Search (SDS; Holland, Fritzsche, & Powell, 1994) was developed by Holland and it is based on his vocational personality types (RIASEC) theory. SDS allows test takers rate their activities, proficiencies, choices, occupations, and self-respect due to RIASEC areas (Bullock, Andrews & Braud, 2006). SDS is a Likert type inventory and responses ranged from 1 (I do not like it at all) to 5 (I like it a lot).

SDS has reliability of r = 0.90 to 0.94 (Holland, Fritzsche, & Powell, 1994). The SDS's predictive validity has been demonstrated regarding work choice and college major in high school, college, and adult samples and proof of SDS's construct validity has been stated in over 500 studies (Bullock *et al.*, 2006; Holland, Fritzsche, & Powell, 1994).

In the present study, Turkish version of the SDS was used which was adapted into Turkish by Çevik and Perkmen (2010) and modified by adding 25 items for mathematics teachers by Gencür (2011). In his study, he worked with 518 primary mathematics pre-service teachers and found that the Cronbach alpha of the instrument as 0.85 and the variance as 49%.

In order to measure the reliability of SDS for the present study, Cronbach's alpha was computed. The alpha for the 55 items was 0.86, which indicates good internal consistency reliability for primary and secondary mathematics pre-service teachers. To assess the internal consistency reliability for each work personality factor; Cronbach's alpha was computed for 5 factors separately. The alpha of the 5 factors are as follows: *realistic* (10 items) is 0.82, *investigative* (9 items) is 0.75, *artistic* (9 items) is 0.78, *social* (9 items) is 0.73, *enterprising* (9 items) is 0.73, and *conventional* (10 items) is 0.71. Thus, internal consistency reliability is moderately high for all factors.

5.2.2. Factors Influencing Teaching Choice Scale (FIT)

In the present study the reasons of pre-service mathematics teachers for choosing their career were assessed by the Factors Influencing Teaching Choice Scale (FIT-Choice Scale; Watt & Richardson, 2007). FIT-Choice Scale was developed by Watt and Richardson (2007) to investigate the question of why people choose teaching as a career. It

contains 43 items for 12 categories which are *teaching abilities, intrinsic value, fallback, job security, time for family, job transferability, shape future of children/adolescents, enhance social equity, make social contribution, work with children/adolescents, prior teaching and learning experiences and social influences*. FIT choice is a Likert type scale in which each factor was measured by multiple-item indicators, and responses ranged from 1 (not at all important) to 7 (extremely important).

In order to meet the purpose of the present study, the Turkish version of the "motivation factors" part of the FIT scale was used. The Turkish FIT Scale was adapted into Turkish by Kılınç (2012). In Kılınç's (2012) study, The CFA for the 12 motivations yielded the following results: Normal theory weighted least squares chi-square = 3198.654, df = 528, RMSEA = .062, NFI = .963, NNFI/TLI = .962, CFI = .969, SRMR = .088.

Prior to this research, while investigating pre-service mathematics teachers' reasons for choosing mathematics teaching, an open ended questionnaire with two questions was conducted with 20 pre-service mathematics teachers in Boğaziçi University. The questions were "What are your reasons for choosing teaching?" and "What are your reasons for choosing mathematics as your teaching subject?" According to analysis of pre-service teachers' answers; it was found that 9 of the students stated that "interest in mathematics" was a significant reason for choosing mathematics teaching as a career. Since FIT choice scale does not have any area specific factor, researcher decided to add "interest in mathematics" category to FIT choice scale with three items for it. These items are as follows: "I may consider being a teacher of another subject rather than mathematics.", "I chose this career because I love mathematics.", "I would choose teaching career even though the subject is not mathematics".

In order to assess reliability of FIT choice scale for the present study, the Cronbach's alpha was computed. The alpha for the 43 items was .88 which also indicates good internal consistency reliability (Leech, Barrett & Morgan, 2011). For each subscale; Cronbach's alpha was separately computed. The alpha of the 13 subscales are as follows: *ability* (including 3 items) is 0.79, *intrinsic career value* (including 3 items) is 0.83, *fallback career* (including 3 items) is 0.68, *job security* (including 3 items) is 0.71, *time for family* (including 5 items) is 0.70, *job transferability* (including 3 items) is 0.58, *shape future of children/adolescents* (including 5 items) is 0.86, *enhance social equity* (including

3 items) is 0.76, *make social contribution* (including 3 items) is 0.73, *work with children/adolescents* (including 2 items) is 0,90, *prior teaching and learning experiences* (including 3 items) is 0.71, *social influences* (including 3 items) is 0.74 and *interest in mathematics* (including 3 items) is 0.31. The Confirmatory Factor Analysis (CFA) was used for scale validation. Initially, the CFA for the 13 motivations yielded low global fit indices: Normal theory weighted least squares chi-square = 2520.760, df = 741, RMSEA = .079, GFI = .766, NNFI/TLI = .766, CFI = .799 (Kline, 1998; Browne & Cudeck, 1993, Byrne, 1994). Moreover, 20 of the modification indices for items to factors were higher than 50, indicating problematic cross-loading items. These items were omitted sequentially and the analyses were re-run until reaching acceptable global fit indices. In total, 5 items were omitted (n2 from *time for family*, n13 from *job security*, n31 from *prior teaching and learning experiences,* n34 from *job transferability* and n41 from *interest in mathematics*). The last CFA yielded acceptable global fit indices: Normal theory weighted least squares chi-square = 880.193, df = 460, RMSEA = .049, GFI = .932, NNFI/TLI = .936, CFI = .948 (Kline, 1998; Browne & Cudeck, 1993, Byrne, 1994). After the scale was modified based on the CFA results, the reliability of modified factors and the whole scale was again computed and the alpha for 13 factors are as following: *Ability* (3 items) is 0.79, *intrinsic career value* (3 items) is 0.83, *fallback career* (3 items) is 0.68, *job security* (2 items) is 0.80, *time for family* (4 items) is 0.81, *job transferability* (2 items) is 0.80, *shape future of children/adolescents* (including 5 items) is 0.86, *enhance social equity* (including 3 items) is 0.76, *make social contribution* (including 3 items) is 0.73, *work with children/adolescents* (2 items) is 0.90, *prior teaching and learning experiences* (2 items) is 0.87, *social influences* (3 items) is 0.74 and *interest in mathematics* (2 items) is 0.67.

5.3. Data Collection

Request for participation e-mails were sent to 28 instructors from 14 universities that have both primary and secondary mathematics education departments. 12 of the instructors replied back to e-mails and admit to apply surveys to their senior mathematics education students. For data collection, surveys were sent to universities by mail. 40 surveys were sent to each of the instructors by mail. After they applied the surveys, instructors sent the surveys back to the researcher. In total, 384 surveys were sent back to researcher from 9 universities.

5.4. Data Analysis

In the current study, there are 2 independent variables (gender and level of teaching). Gender is the state of being female and male and the level of teaching is categorized as primary mathematics teaching (grade 5-8) and secondary mathematics teaching (grade 9-12). There are 2 main dependent variables of the current study which are work personality types and reasons for choosing mathematics teaching. Moreover, each dependent variable has subcategories.

Work personality types variable has 5 categories. To find the RIASEC (*realistic, investigative, artistic, social, enterprising and conventional*) profile for each individual, the mean of the RIASEC categories was calculated for each of the participants. The category which has the highest mean for the participant was stated as work personality type of that participant who was represented by the first letter of the category (e.g. R for *realistic*). So each participant was assigned to a letter. Then the frequency of work personality types of the participants were investigated. In addition to mean of the categories for each participant, the mean of the categories for whole sample were also calculated. The distribution of sample's work personality type was also investigated.

Reasons for choosing mathematics teaching variable has 13 categories: *Teaching abilities, intrinsic value, fallback, job security, time for family, job transferability, shape future of children/adolescents, enhance social equity, make social contribution, work with children/adolescents, prior teaching and learning experiences, social influences and interest in mathematics*. Since *interest in mathematics* category was not a part of original FIT choice scale, rather added afterwards for the purposes of the present study, confirmatory factor analysis (CFA) was performed to investigate model fit and enhance the scale validation. 5 items were omitted from the FIT choice scale based on CFA results. Thus, all analysis related to FIT choice scale were rerun.

For each category of reasons, descriptive statistics (mean, standard deviation, range) were calculated. Associated with research questions, not only descriptive statistics was calculated but also mean of the each category of work personality types and reasons for choosing teaching were compared by using appropriate statistical testing methods. Multivariate analyses of variance (MANOVAs) were conducted to compare reasons and work personality types for gender and level of teaching. MANOVA method was chosen for

the analysis because there were multiple dependent variables needed to be analyzed together.

6. RESULTS

In this section, the findings of the present study will be stated. The results of data analysis will be presented in two sections: (i) Work personality types of Turkish pre-service mathematics teachers, (ii) Reasons of Turkish pre-service mathematics teachers for choosing teaching as a career, (iii) Correlation of reasons and work personality types. These sections include both the descriptive (mean, standard deviation, and range), comparative (comparisons regarding gender and level of teaching) and correlational statistics related with research questions.

6.1. Work personality types of Turkish pre-service mathematics teachers

The first research question was descriptive. Social personality type category was rated highest (M=3.85, SD=0.78), while the enterprising (M=2.93, SD=0.83) category was rated lowest. Descriptive statistics according to RIASEC categories is demonstrated in Table 6.1.

Table 6.1. Descriptive Statistics of RIASEC categories.

Descriptive Statistics			
	Mean	Std. Deviation	N
Social	3.85	0.78	384
Investigative	3.59	0.91	384
Artistic	3.21	0.87	384
Conventional	3.18	0.83	384
Realistic	2.96	0.93	384
Enterprising	2.93	0.83	384

As seen on Table 6.1, there is not a clear cut among the mean of the RIASEC categories. However, in order to see the distribution of the participants' work personality types, the mean of each category was also computed for each participant. Each participant was represented by the name of the category with the highest mean for that participant. More than half of the participants (52%) were *social* according to Holland's theory. The

percentages of the participants in other domains are as follows: *investigative* (24.5%), *artistic* (8,3%), *realistic* (6.8%), *conventional* (5.5%), *enterprising* (3.3 %). Distribution of the participants in terms of their work personality types is shown in Figure 6.1.

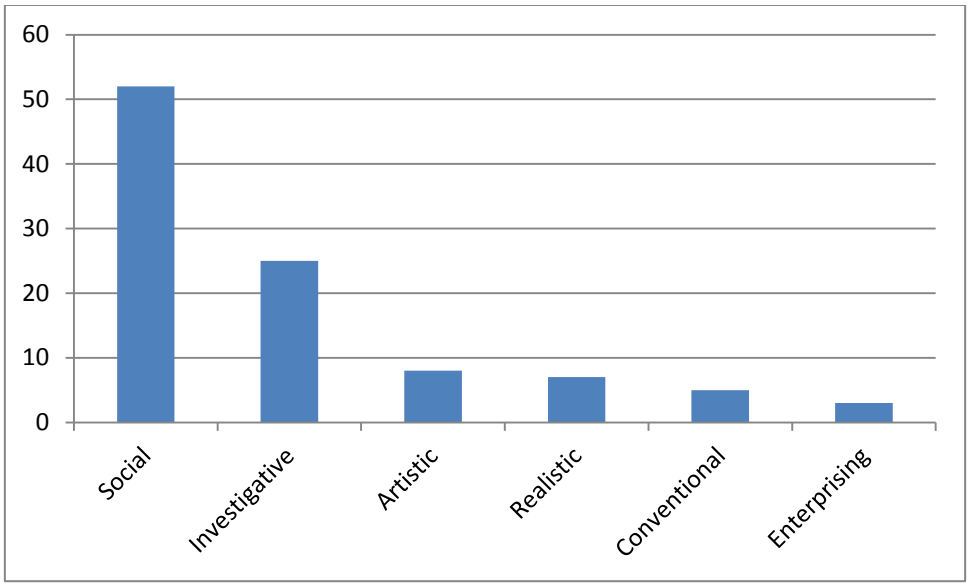

Figure 6.1. Percentages of participants according to RIASEC.

The second and third research questions were comparative. The effect of gender on the linear combination of RIASEC categories was found significant (Wilks' Lambda= .79, $F (6, 281) = 12.03$, $p < .001$, partial $\eta 2 = .20$). The further analysis showed that, among 6 work personality types, there are significant results for three categories: realistic, artistic and social. There is a significant difference between females and males in terms of realistic (Wilks' Lambda= .79, $F (6, 281) = 17.27$, $p < .001$, partial $\eta 2 = .05$), artistic (Wilks' Lambda= .79, $F (6, 281) = 10.97$, $p < .001$, partial $\eta 2 = .03$) and social (Wilks' Lambda= .79, $F (6, 281) = 6.71$, $p < .01$, partial $\eta 2 = .02$) work personality types. In Figures 6.2, 6.3, 6.4 Error Bar Charts demonstrates graphical representation of the variability of data by comparing confidence intervals (95%) of female and male participants.

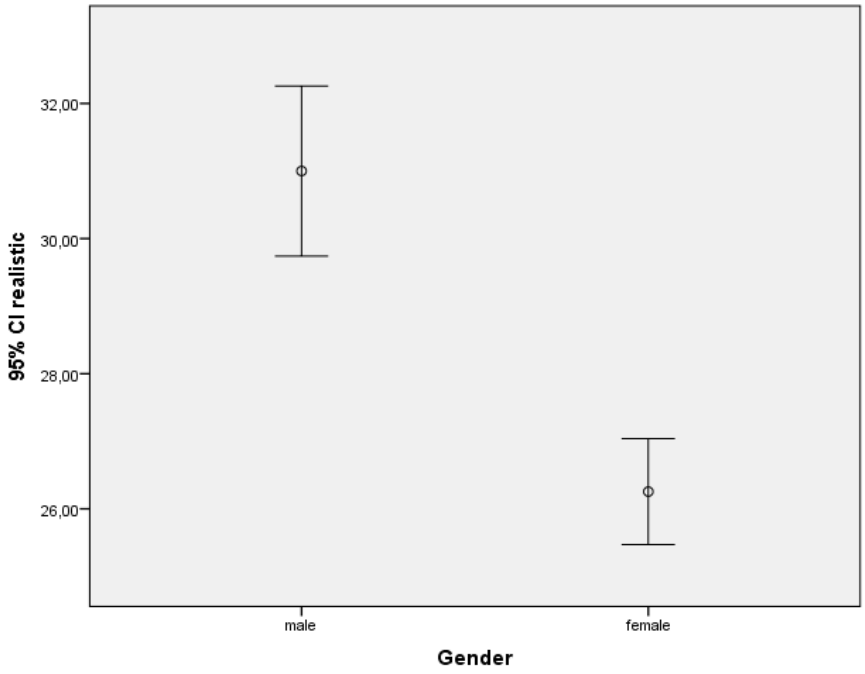

Figure 6.2. Confidence Intervals of Realistic Scores for Female and Male Participants.

As shown by the chart in Figure 6.2, confidence intervals for females (95% CI [25.47, 27.03]) and male (95% CI [29.74, 32.25]) do not overlap for realistic category. This would suggest that there is a real difference between the population means. In figure 6.3 confidence intervals of female (95% CI [30.02, 31.40]) and male (95% CI [26.38, 28.81]) participants also shows that there is a significant difference according to gender for artistic category. Although, there is a significant difference according to gender for social category, the difference is relatively low compared to realistic and artistic categories (see Figure 6.4.).

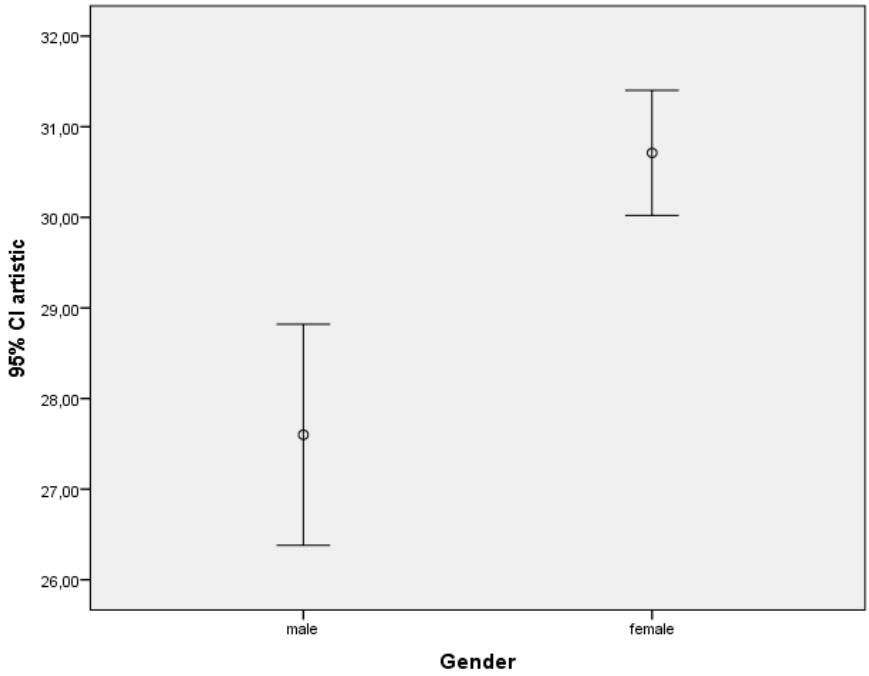

Figure 6.3. Confidence Intervals of Artistic Scores for Female and Male Participants.

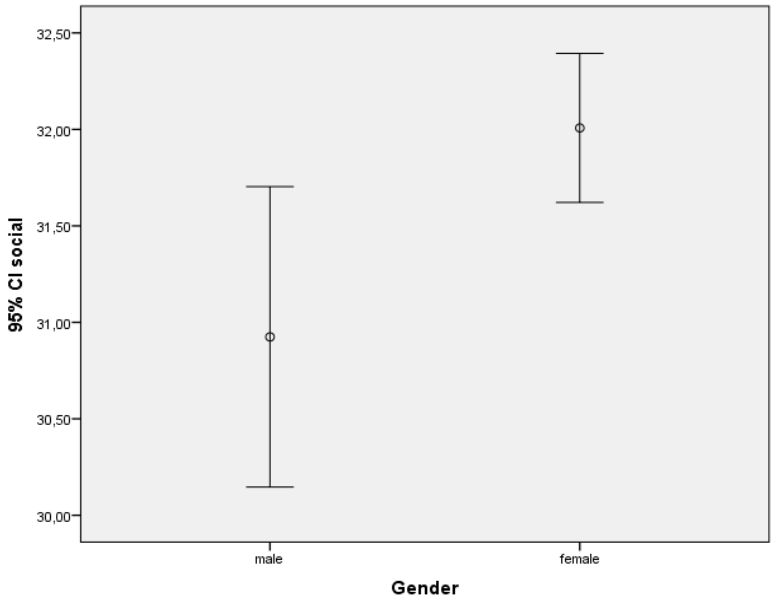

Figure 6.4. Confidence Intervals of Social Scores for Female and Male Participants.

The effect of level of teaching on the linear combination of RIASEC categories was not found significant (Wilks' Lambda = .97, F (6, 281) = 1.37, p = .22, partial η2 = .02). However, there is a significant difference between primary mathematics and secondary mathematics pre-service teachers in terms of investigative work personality (Wilks' Lambda= .97, F (6, 281) = 4.14, p < .05, partial η2 = .01). In Figure 6.5, Error Bar Chart demonstrates graphical representation of the variability of data by comparing confidence intervals (95%) of primary mathematics (PMATH) and secondary mathematics (SMATH) pre-service teachers for intrinsic work personality type.

As shown by the chart in figure 6.5, confidence intervals for PMATH (95% CI [32.16, 33.60]) and SMATH (95% CI [33.98, 35.64]) participants do not overlap for investigative category. This would suggest that there is a real difference between the population means.

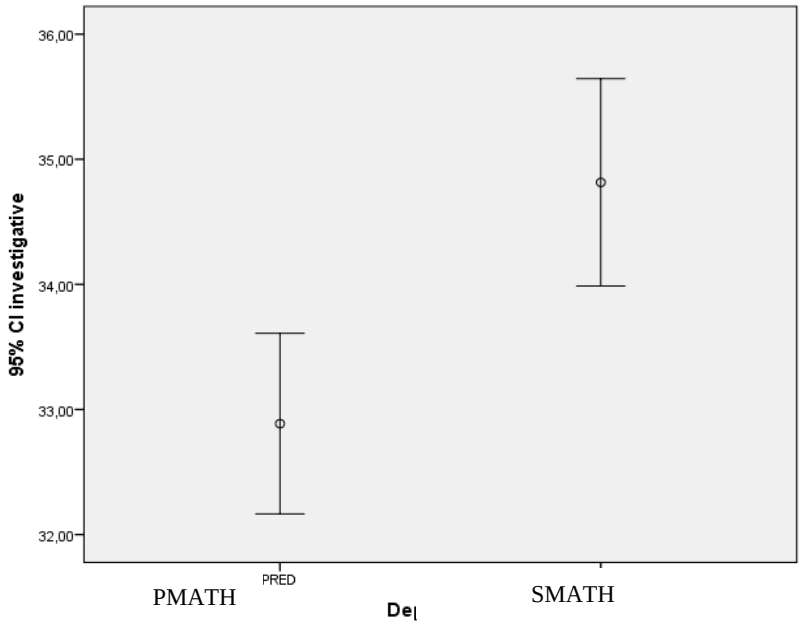

Figure 6.5. Confidence Intervals of Investigative Scores for primary mathematics (PMATH) and secondary mathematics (SMATH) pre-service teachers.

6.2. Reasons of Turkish pre-service mathematics teachers

The third research question was related with participants' reasons for choosing mathematics teaching.

Social utility values were the top three reasons that were rated highest among participants. The highest rated reason was *shape future of children/adolescents* (M=5.66, SD=1.21), which was closely followed by *make social contribution* (M=5.65, SD=1.21) and *enhance social equity* (M=5.36, SD=1.32). The lowest rated reason was choosing mathematics teaching as a *fallback* career (M= 3.41, SD=1.70). Descriptive statistics and rankings of reasons for choosing mathematics teaching as a career is demonstrated in Table 6.2.

Table 6.2. Descriptive Statistics of Reasons of Choosing Mathematics Teaching

Descriptive Statistics			
	Mean	SD	N
Shape future of children/adolescents	5.66	1.21	384
Make social contribution	5.65	1.21	384
Enhance social equity	5.36	1.32	384
Ability	5.27	1.15	384
Prior teaching and learning experiences	5.25	1.38	384
Interest in mathematics	5.13	1.95	384
Work with children	5.05	1.72	384
Intrinsic career value	4.98	1.50	384
Time for family	4.91	1.82	384
Job security	4.70	1.51	384
Social influences	4.02	1.75	384
Job transferability	3.98	2.11	384
Fallback	3.41	1.70	384

The fourth and fifth research questions were comparative according to gender and level of teaching. There were significant differences between females and males in terms of their *social utility values* reasons (Wilks' Lambda= .89, F=6.302, $p < .05$, partial $\eta 2 = .01$). Female participants' total scores for *shape future of children/adolescents, enhance social equity* and *make social contribution* was significantly higher than male participants'. Table 6.3 shows the mean and the standard deviations of female and male participants' total scores for *shape future of children/adolescents, enhance social equity* and *make social contribution* categories. There was no significant difference between primary mathematics and secondary mathematics teachers in terms of their reasons for choosing mathematics teaching as a career.

Table 6.3. Mean and the standard deviations of female and male participants' total scores for *shape future of children/adolescents, enhance social equity* and *make social contribution* categories.

		Female	Male
Shape future of children/adolescents	Mean	28.90	27.08
	SD	5.60	6.34
Enhance social equity	Mean	16.37	15.36
	SD	3.67	3.79
Make social contribution	Mean	17.06	16.17
	SD	3.23	3.76

6.3. Correlation of Reasons and Work Personality Types

In this section, correlations between categories will be represented. Pearson correlation test was conducted in order to see whether there is a relationship between categories of reasons for choosing mathematics teaching and categories of work personality types. Table 6.4 shows the results of correlations of categories.

Realistic work personality type is positively correlated with *fallback* reason category ($p < 0.05$) *and job transferability* reason category ($p < 0.05$). *Investigative* work personality type is positively correlated with *ability* ($p < 0.001$), *intrinsic* ($p < 0.01$), *social utility values* ($p < 0.001$) and *prior teaching and learning experiences* ($p < 0.001$) reason categories. *Artistic* work personality type category is positively correlated with *ability* ($p < 0.001$), *personal utility values* ($p < 0.001$), *social utility values* ($p < 0.001$) reason categories and negatively correlated with *interest in mathematics* ($p < 0.001$) reason category. *Social* work personality type is positively correlated with *ability* ($p < 0.001$), *intrinsic* ($p < 0.001$), *job transferability* ($p < 0.001$), *social utility values* ($p < 0.001$), *prior teaching and learning experiences* ($p < 0.001$) reason categories and negatively correlated with *fallback* reason category ($p < 0.001$). *Enterprising* work personality type category is positively correlated with *ability* ($p < 0.001$), *job transferability* ($p < 0.001$) and *job security* ($p < 0.001$) categories. *Conventional* work personality type category is positively correlated with *ability* ($p < 0.001$), *intrinsic* ($p < 0.001$), *job security* ($p < 0.001$), *job transferability* ($p < 0.01$), *social utility values* ($p < 0.001$), *prior teaching and learning experiences* ($p < 0.001$), *social influences* ($p < 0.05$), reason categories.

Table 6.4. Correlations of categories of reasons for choosing mathematics teaching and categories of work personality types.

		ability	intrinsic	fallback	job security	time for family	job transferability	personal utility	shape future of children/adolescents	enhance social equity	make social contribution	work with children	social utility	prior teaching and learning experiences	socail influence	interest inmathematics
realistic	Pearson Correlation	.024	-.011	.114*	.038	.082	.107*	.094	-.077	-.066	-.032	.007	-.049	.008	-.023	-.098
	Sig. (2-tailed)	.649	.833	.029	.462	.115	.041	.076	.147	.210	.546	.901	.365	.878	.660	.060
	N	360	358	364	371	371	366	359	357	365	359	368	347	371	361	371
investigative	Pearson Correlation	.253**	.136**	-.045	-.020	-.118*	.091	-.010	.200**	.176**	.128*	.180**	.204**	.152**	.017	.058
	Sig. (2-tailed)	.000	.010	.398	.695	.024	.081	.846	.000	.001	.015	.001	.000	.003	.752	.269
	N	358	356	362	369	369	365	359	355	363	357	366	345	369	361	369
artistic	Pearson Correlation	.146**	.049	.058	.048	.102*	.202**	.158**	.140**	.170**	.121*	.154**	.161**	.074	.095	-.204**
	Sig. (2-tailed)	.005	.356	.270	.359	.049	.000	.003	.008	.001	.021	.003	.003	.152	.072	.000
	N	361	359	365	372	372	367	360	357	366	361	369	348	372	362	372
social	Pearson Correlation	.173**	.224**	-.163**	-.005	-.040	.184**	.081	.406**	.371**	.339**	.392**	.427**	.149**	.150**	-.084
	Sig. (2-tailed)	.001	.000	.002	.931	.437	.000	.124	.000	.000	.000	.000	.000	.004	.004	.106
	N	363	361	366	373	373	368	361	358	367	361	370	348	373	363	373
enterprising	Pearson Correlation	.213**	-.006	.028	-.005	.051	.242**	.125*	.033	.068	.059	.053	.072	-.021	.097	-.079
	Sig. (2-tailed)	.000	.916	.594	.924	.333	.000	.018	.536	.200	.263	.312	.185	.689	.067	.128
	N	358	357	361	368	368	363	356	353	362	358	365	345	368	359	368
conventional	Pearson Correlation	.260**	.211**	-.096	.146**	.066	.125*	.154**	.272**	.215**	.273**	.277**	.321**	.162**	.133*	-.006
	Sig. (2-tailed)	.000	.000	.068	.005	.208	.017	.004	.000	.000	.000	.000	.000	.002	.011	.906
	N	361	358	364	371	371	366	359	356	365	359	368	346	371	363	371

7. DISCUSSION AND CONCLUSION

The aim of the present study was threefold. First one was to examine the reasons given by Turkish pre-service mathematics teachers for choosing teaching as a career through demographic characteristics (gender and level of teaching) of the participants. The second purpose was to examine the work personality types of Turkish pre-service mathematics teachers through demographic characters (gender, department, householder's education) of the participants. The last one is to determine if there is a relationship between the reasons (13 reason categories) and work personality types (RIASEC categories) of the Turkish pre-service mathematics teachers.

In this chapter the conclusion of the results will be discussed under four main sections: (i) Work Personality Types of Turkish Pre-service Mathematics Teachers, (ii) Turkish Pre-service Mathematics Teachers' Reasons for Choosing Teaching as a Career, (ii) Relationship between Reasons for Choosing Mathematics Teaching and Work Personality Types of Turkish Pre-service Mathematics Teachers, (iv) Limitations and Suggestion for Further Research.

7.1. Work Personality Types of Turkish Pre-service Mathematics Teachers

According to Holland (1997), individuals make their career decisions due to their work personality types. These work personality types are referred by the acronym RIASEC (realistic, investigative, artistic, social, enterprising, and conventional). One of the aims of the present study was to understand the RIASEC profile of pre-service mathematics teachers.

More than half of the participants (52%) of this study have *social* personality type. Holland (1997) claims that *social* people choose activities which involve working with people and interaction by educating, informing, curing, or enlightening those people. Since Holland's theory places teachers in the *social* domain, these results are highly consistent with his theory. Moreover, participating women in present research rated social activities significantly higher than men. This can explain why teaching is seemed as a "female job" in Turkey as most of the countries.

The second highest rated work personality type was *investigative* (25% of the participants). According to Holland (1997), investigative people are intellectual, methodical, rational, analytical, logical and good at tasks that are scholarly and scientific. This result is consistent with the reasons of pre-service mathematics teachers for choosing teaching as a career due to nature of mathematics. This conclusion is also supported by participants having *interest in mathematics* as the highest rated reason. These results shows that the pre-service mathematics teachers are not only fond of teaching, but also they made a decision to be a teacher due to high interest in their subject matter. Moreover, secondary school mathematics teachers' score for investigative work personality type was significantly higher than primary school mathematics teachers'. Since, secondary mathematics teaching requires higher knowledge level than primary mathematics teaching, people who choose to be a secondary mathematics teacher are clearly more investigative (Book & Freeman, 1986).

The other four work personality types that participants belong are as following respectively: *artistic* (8% of the participants), *conventional* (7% of the participants), *realistic* (5% of the participants) and *enterprising* (3% of the participants). Even though, these work personality types have low percentages, their mean scores were not low in terms of whole sample. So it is also important to understand how those four categories interact with gender. Females have significantly higher score for artistic, whereas males have significantly higher score for realistic work personality type. This result is consistent with the previous studies on gender (Lippa, 2005; Weinrach, 1996). Lippa's (2005) study with 4479 participants suggests that women tend to be more interested in working in social and artistic atmospheres where they are able to be creative, teach and care for others, while men tend to have more interest in realistic occupations where they are able to work with their hands, work outdoors, or perform athletic activities.

It is also important to investigate the lowest work personality types rated by participants. *Enterprising* factor was the lowest rated by participants. An individual with *enterprising* interests may enjoy taking risks, being involved in competition with others or working in business environments but dislike working in an area where lots of scientific ability is required (Ludwikowski, 2010). On the other hand, teaching environment may not

offer risks or competition as much as business area. Thus, choosing mathematics teaching career may explain the low interest in *enterprising* activities.

7.2. Turkish Pre-service Mathematics Teachers' Reasons for Choosing Teaching as a Career

According to FIT choice theory, there are 12 categories of reasons for choosing teaching as a career (Watt & Richardson, 2007). These categories are *teaching abilities, intrinsic value, fallback, job security, time for family, job transferability, shape future of children/adolescents, enhance social equity, make social contribution, work with children/adolescents, prior teaching and learning experiences and social influences.* Since there is no subject specific category in FIT choice theory, *interest in mathematics* category was added for the purpose of the current study.

In order to investigate Turkish pre-service mathematics teachers' reasons for choosing teaching as a career, Factors Influencing Teaching Choice (FIT) scale was conducted with 384 participants from 9 Turkish universities. The altruistic social utility values (shape future of children and adolescents, make social contribution, enhance social equity) were the highest rated reasons by participants. These results are consistent with the previous studies that indicate that altruistic reasons are highly influential for pre-service teachers to choose teaching (e.g., Kılınç, *et al*., Kyriacou, Hultgren& Stephens, 1999; Reid & Caudwell, 1997; Şaban, 2003). In Şaban's (2003) study with 381 Turkish pre-service elementary teachers, most of the participants rated the altruistic reasons as the most important (69%). "I want to contribute to the future of society" and "I want to help children learn and succeed in school." were the two top reasons that were given by participants. Kılınç and his colleagues also used FIT choice scale to investigate the reasons of Turkish pre-service teachers from various disciplines for choosing teaching, and social utility values were rated highest.

While social utility values (shape future of children and adolescents, make social contribution, enhance social equity) are the most rated reasons, interest in mathematics, ability and intrinsic reasons were rated relatively lower for choosing mathematics teaching. The preferences of social utility values over intrinsic ones may be a highlighter of Turkish society's culture, which gives importance to the aims of society rather than individual

goals and interests (Kılınç, *et al.*, 2012). Therefore, it can be concluded that individuals who choose teaching demonstrates the characteristics of this collectivist culture.

Fallback reasons for choosing mathematics teaching was rated lowest by the participants of the current study. This finding may show that pre-service mathematics teachers choose mathematics teaching willingly rather than as a forced choice. Job transferability is the second lowest rated reason by the participants of this study. The items under this category emphasize the mobility that teaching offers. Since there are fewer opportunities to work as a teacher outside Turkey and the appointment of teachers is centralized and directed by government, the transferability of teaching may not be valid for Turkish context. While job security and job transferability reasons were rated low by participants, time for family was rated moderately higher. Although all three factors belong to extrinsic personal utility value category, one reason that time for family has a higher rating among personal utility values may be the large size of households (OECD, 2013) and the cultural importance of families in Turkish society. Moreover, women put more emphasis on social utility values which supports another result of this study that women more appreciate the social aspects of a job compared to their male counterparts. Choosing teaching for social utility reasons and having a social work personality type may indicate a bridge between reasons of pre-service mathematics teachers' for choosing mathematics teaching and their work personality types.

7.3. Relationship between Reasons for Choosing Mathematics Teaching and Work Personality Types of Turkish Pre-service Mathematics Teachers

The motivation behind current study was to answer the question "Why Turkish pre-service mathematics teachers choose mathematics teaching as a career?". In order to answer this question, the reasons of pre-service mathematics teachers for choosing to teach as a career were investigated. Moreover, their demographic characteristics were examined in order to have a wider perspective which helps us understand what brings different individuals to a common ground of mathematics teaching career. Personality type of the participants were also investigated since it is another important factor for an individual to choose a career path. Third major goal of this study was to investigate if there is a relationship between reasons for choosing mathematics teaching and work personality types of Turkish pre-service mathematics teachers. In order to have a deeper understanding

of why people choose mathematics teaching as a career, it is important to understand the relationship of the highest rated reasons with work personality types.

Social work personality type is highly related with social utility values reasons. It is not surprising that giving reasons as *shaping future of children* or *making a social contribution* for choosing mathematics teaching is related with having a social personality which embodies caring, helpful characteristics. It is also important to note that the lowest rated fallback reason category was negatively correlated with social work personality type. This may mean that having a social personality relates with choosing teaching on purpose rather than as a forced choice.

The quarter of the participants have investigative work personality type which is related with ability, prior teaching and learning experiences, intrinsic career value reasons for choosing mathematics teaching. This relation may show that investigative people who are rational, logical and scientific emphasize on their abilities for the subject area and their prior learning and teaching experiences to be a mathematics teacher.

7.4. Limitations and Suggestions for Further Research

In this section, the limitations of the present research and suggestions for further research will be presented. As in every study, the current study has some limitations need to be pointed out.

First limitation is the low reliability of two categories in FIT choice scale: *job transferability* and *interest in mathematics*. *Job transferability* was a construct originally developed within for an Australian context where teachers have the opportunity to relocate easily in Australia and overseas. Thus, *job transferability* was considered as a reason for Australian pre-service who may choose teaching for the opportunities to travel and work, especially overseas. In Turkey, there are fewer opportunities to work as a teacher in different countries, moreover, the appointment of teachers are centralized and directed by the government. So, *job transferability* reasons may not be convenient for Turkish pre-service teachers. The second category which has low internal consistency reliability was the *interest in mathematics* added later by the researcher of this study. Low reliability of *interest in mathematics* reason might occur from the number of unanswered items in this category. The items might not be constructed properly. Even though the category has the highest mean among participants, having a low reliability may influence the accuracy of

analysis related with this category. Therefore, further research may focus on the interest of subject matter with more reliable and sophisticated items.

Other limitation is the unbalance between the numbers of pre-service primary mathematics teachers (N=218) and pre-service secondary mathematics teachers (N=166). Although 14 universities that have primary mathematics education departments and secondary mathematics education departments together were chosen and sent request for participation e-mails to both departments in those universities; the response rate was different between departments. This may be the reason there was no significant difference between the reasons of pre-service mathematics teachers according to level of teaching.

The last but not the least, this study used surveys where participants may only answers the fixed questions by selecting a response. However, in future, a qualitative study may also take place to have a deeper understanding of why people choose mathematics teaching as a career.

APPENDIX A: Demographic Survey

Cinsiyetiniz:

Erkek ☐

Kadın ☐

Üniversite ismi:

Bölümünüz: Ortaöğretim Matematik Öğretmenliği ☐ İlköğretim Matematik Öğretmenliği ☐

Eve asıl gelir getiren kişinin mesleği (Ev halkında kimsenin geliri yoksa belirtiniz. Emekli ise lütfen emeklilik durumunu ve önceki işini belirtiniz.) :

Eve asıl gelir getiren kişinin eğitim durumu:

İlkokul terk ☐

İlkokul mezunu ☐

Ortaokul mezunu ☐

Normal lise mezunu ☐

Meslek lisesi mezunu ☐

2 yıllık yüksek okul mezunu ☐

Açık öğretim üniversite mezunu ☐

Normal üniversite mezunu ☐

Lisansüstü mezunu ☐

APPENDIX B: Self Directed Scale (SDS)

Aşağıda 55 tane mesleki aktivite verilmiş ve bunları yapmayı ne düzeyde sevdiğiniz sorulmuştur.

Lütfen size uygun olan seçeneği kutulara x işareti koyarak işaretleyiniz. Her soru için <u>sadece</u> bir kutuya işaret koyunuz.	Hiç Sevmem	Sevmem	Ne severim ne sevmem	Severim	Çok severim
1. Diğer insanların problemlerini dinlemeyi ve onlara çözümler üretmeye çalışmayı					
2. Çalıştığım işte yenilikler peşinde koşmayı					
3. Bir müzik enstrümanı (aleti) çalmayı					
4. Derslerde not tutmayı					
5. Toplum ve kamu yararı için başkalarından bağış toplamayı					
6. Sanatsal içerikli fotoğraflar çekmeyi					
7. Bağ bahçe işleriyle uğraşmayı					
8. Bilimsel teorileri (sosyal, dil, fen, matematik vb. alanlardan herhangi birinde) anlamaya çalışmayı					
9. Başkalarına bir şeyler öğretmeyi					
10. Kendi hedeflerine ulaşmak için başkalarını kullanmayı					
11. Mekaniksel ve elektrikli cihazların çalışma mekanizmasını anlamaya çalışmayı					
12. Bir ürünün kullanım kılavuzunu takip ederek nasıl çalıştığını anlamaya çalışmayı					
13. Başka insanlara rehberlik yapmayı ve yol göstermeyi					
14. El becerisi gerektiren işler yapmayı					
15. Sosyal ve doğa olaylarının nedenlerini araştırmayı					
16. Tiyatro ve drama gibi oyunlarda oynamayı					
17. Bir işyerinde yöneticilik, idarecilik ve müdürlük yapmayı					
18. Bir ürünün kusurlarını araştırmayı					
19. Bir problemin çözümü için orijinal fikirler üretmeye çalışmayı					
20. Fiziksel güç gerektiren sporlar (judo, güreş, dağcılık, boks vb.) yapmayı					
21. Birlikte çalıştığım insanları iş yapma noktasında motivasyonlarını artırmaya çalışmayı					
22. Empati kurmayı (Kendini başaklarının yerine koyarak onların duygu düşüncelerini anlamaya çalışmayı)					
23. Boya, badana, tamir vb. ev işleriyle uğraşmayı					
24. Resim ve karikatür gibi sanatsal çizimler yapmayı					

Lütfen size uygun olan seçeneği kutulara x işareti koyarak işaretleyiniz. Her soru için sadece bir kutuya işaret koyunuz.	Hiç Sevmem	Sevmem	Ne severim ne sevmem	Severim	Çok severim
48. Bir yardım kuruluşunda gönüllü olarak çalışmayı					
49. Başkalarına bir şeyler satmayı, ürün pazarlamayı veya reklamını yapmayı					
50. Zihne takılan bir problemin ve sorunun çözümü için çeşitli kaynaklar taramayı (kütüphaneye gitmeyi, internette aramak yapmayı uzman kişilerle görüşmeyi vb)					
51. Hayal gücü ve yaratıcılık gerektiren işlerle uğraşmayı					
52. Bilim ve teknoloji dünyasındaki yeni gelişmeleri (yeni ürünleri, teknolojileri, fikirleri) takip etmeyi					
53. Evrak düzenleyip dosyalamayı					
54. Bir teknik serviste çalışmayı					
55. Günlük hayattaki harcamaların listesini tutmayı					

alanlarda konuşma yapmayı					
35. Bir şeyler keşfetmek veya icat etmek amacıyla deneyler (bilimsel veya amatör) yapmayı					
36. İş makineleri (kepçe, dozer, kamyon vb.) kullanmayı					
37. Hesap kitap işleri ile uğraşmayı					
38. Daha fazla maddi gelir elde etmek amacıyla yüksek risk gerektiren yatırımlar yapmayı					
39. Maddi çıkar beklemeden başkaları için zaman ayırmayı					
40. Projelerde araştırmacı olarak görev yapmayı					
41. Bir resmi veya özel kuruluşta görsel tasarımcı olarak çalışmayı					
42. Emir komuta zincirinin olduğu (hiyerarşinin olduğu) iş yerlerinde çalışmayı					
43. Bozulan mekaniksel ve elektrikli cihazları tamir etmeye çalışmayı					
44. Bir film senaryosu, roman, hikâye vb. yazmayı					
45. Dikkat ve titizlik gerektiren işler yapmayı					
46. Ağaç işleri ile uğraşmayı (maket yapmayı, ağaçtan ürünler tasarlamayı vb.)					
47. Dans etmeyi, halk oyunları veya folklorik oyunlar oynamayı					

APPENDIX C: Factors Influencing Teaching Choice Scale (FIT)

Aşağıdaki her bir ifadenin, matematik öğretmenliği mesleğini seçmenizle ilgili kararınızda ne kadar önemli olduğunu, 1 (hiç önemli değildi)'den 7(aşırı derecede önemliydi)'ye kadar olan seçeneklerden birini x işareti koyarak belirtiniz.

	Hiç önemli değildi						Aşırı derecede önemliy
	1	2	3	4	5	6	7
1. Matematik öğretmenliği ile ilgileniyorum.							
2. Öğretmenlik yapmak aileme daha fazla zaman ayırmamı sağlayacaktır.							
3. Arkadaşlarım matematik öğretmeni olmam gerektiğini düşünüyor.							
4. Matematikten farklı bir alanda da öğretmenlik yapmayı düşünebilirim.							
5. İyi bir matematik öğretmeninin sahip olduğu niteliklere sahibim.							
6. Öğretmenlik topluma hizmet etmemi sağlayacaktır.							
7. Her zaman matematik öğretmeni olmayı istedim.							
8. Öğretmenlik bana çocuk ve gençleri şekillendirme fırsatı verecektir.							
9. Çocuk veya gençlerin öğrenmelerine yardımcı olmayı isterim.							
10. Hangi kariyeri istediğimden emin değildim.							
11. Matematik öğretmenliğini seviyorum.							
12. Çocuk veya gençlerle çalışmayı içeren bir iş istiyorum.							
13. Öğretmenlik sürekliliği olan bir kariyer sağlayacaktır.							
14. Öğretmenlikte çalışma saatleri bir aile kurmanın getireceği sorumlulukları yerine getirmem için uygundur.							
15. İlham verici öğretmenlerim vardı.							
16. Bir öğretmen olarak gün içindeki çalışma sürem kısa olacak.							
17. Güçlü öğretme yetilerine sahibim.							
18. Öğretmenler topluma değerli katkılarda bulunur.							
19. Öğretmenlik gelecek nesli etkilememi sağlayacak.							
20. Ailem öğretmen olmam gerektiğini düşünüyor.							
21. Çocuk veya gençlerin bulunduğu bir ortamda çalışmak istiyorum.							
22. Öğretmenlik maaşımın sürekli ve düzenli olmasını sağlayacak.							
23. Okul tatilleri ailem için gerekli olan sorumlulukları yerine getirmemi kolaylaştıracak.							
24. Model olarak aldığım iyi öğretmenlerim vardı.							
25. Öğretmenlik toplumdan aldıklarımı geri verme imkanı yaratacak.							
26. Bir öğretmen olarak farklı ülkelerde çalışabilirim.							
27. En çok istediğim bölümü kazanamadım.							

Aşağıdaki her bir ifadenin, matematik öğretmenliği mesleğini seçmenizle ilgili kararınızda ne kadar önemli olduğunu, 1 (hiç önemli değildi)'den 7(aşırı derecede önemliydi)'ye kadar olan seçeneklerden birini x işareti koyarak belirtiniz.

Hiç önemli değildi **Aşırı derecede önemliydi**

	1	2	3	4	5	6	7
28. Öğretmenlik, imkanı olmayan öğrencilerin başarma azimlerini arttırmama olanak sağlayacak.							
29. Çocuk ve gençlerle çalışmayı seviyorum.							
30. Öğretmenlik sürekliliği olan bir işe sahip olmamı sağlayacak.							
31. Matematik öğrenme konusunda iyi deneyimlere sahibim.							
32. Birlikte çalıştığım insanlar öğretmen olmamın gerekli olduğunu düşünüyor.							
33. Matematik öğretmenliği yeteneklerime uygun bir meslektir.							
34. Öğretmenlik yaşamayı istediğim yeri seçmemi sağlayabilir.							
35. Öğretmenlik kariyerini matematik alanında olmasa da tercih ederdim.							
36. Öğretmenlik sosyal yönden yardıma ihtiyacı olan çocuklara veya gençlere yardım etme fırsatı sağlayacak.							
37. Öğretmenlik diploması Avrupa ülkelerinde öğretmen olarak çalışmamı sağlayabilir.							
38. Öğretmenlik tatmin edici bir kariyerdir.							
39. Öğretmenlik çocuk ve gençler üzerinde bir etkimin olmasını sağlayacak.							
40. Öğretmenlik sosyal yönden dezavantajlılığa karşı mücadele etmemi sağlayacak.,							
41. Matematik öğretmenliği bölümünü matematiği sevdiğim için seçtim.							
42. Öğretmenliği son çare olarak seçtim.							
43. Bir öğretmen olarak uzun tatillerim olacak.							

Zaman ayırdığınız için teşekkür ederim.

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