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THE RELATIONSHIP BETWEEN PERSONALITY TRAITS AND LEARNING STYLES: A CLUSTER ANALYSIS

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ABSTRACT

The aim of this study is to identify the relationship between personality types of college students and their learning styles. The total population of the study is composed of 421 undergraduate students from University of Gaziantep. The Big Factor Personality Inventory and Kolb's Learning Styles Inventory III were used as the research tools. Participants' personality traits, dispersion levels of their learning styles and the relationships between these two variables were measured by using K-means cluster, percentage and frequency and chi-square analysis respectively. The results of the cluster analysis suggested two different personality profiles and the participants appeared to be equally distributed into these two groups. In terms of learning styles, it was noticed that the majority of the participants adopted assimilating and diverging learning styles. The results revealed a meaningful relationship between learning styles and personality profiles.

Keywords: Personality Traits, Learning style, College students

INTRODUCTION

In the related literature, it has been widely accepted that personality trait approach has decisive effects on concepts like business performance, work values, entrepreneurship, stress, depression, satisfaction, organizational citizenship, teamwork, organizational commitment, learning, concepts such as academic achievement (Miller, 1991; Barrick & Mount, 1993; Erdheim, Wang & Zickar, 2006; Organ & Lingl, 1995; Busato et al., 1998; Berings, De Fruyt & Bouwen, 2004; Chioqueta & Stiles 2005; Blickle, 1998; Molleman, 2005; Chamorro-Premuzic & Furnham, 2008).

Although the relationship between personality and many other concepts have been investigated in numerous studies, studies on the relationship between personality and learning are quite limited. However, the close relationship between personality and learning is generally accepted. It is a common sense that mere effort may not be enough for effective learning. Instead of spending too much time on a certain topic, acting according to certain learning styles will make the process more effective. In addition, by using certain learning styles, people can achieve higher motivation in terms of cognition and they can adapt to the learning process better. Considering that learning styles emerge as habits, the interference of personality trait, which is a relatively more abstract entity, will affect the learning behavior.

Therefore, personality traits serve as preparation in achieving specific objectives or certain situations (Caligiuri, 2000). In other words, personality traits facilitate learning behavior and motivate the person, and these traits are decisive for the person in insisting or giving up (Blickle, 1998).Considering that learning is actually processing information, the most important elements of the process are perception, attention, memory, and thinking. On the other hand, learning is the management of mental responses to stimuli. Personality traits are

also involved in this process and they act as an intermediary. Thus, they affect the learning behavior more (De Raad & Schouwenburg, 1998). In this context, personality traits seem to have some effects on learning styles, and there seems to be a significant relationship between some personality traits and learning styles.

Personality

Personality is defined as an inborn temperament and features arising in different situations and a combination of the characteristics of a person which separate him/her from other people (Phares, 1991).According to another definition, personality is the unique features of every human being; exhibition of characteristic adaptations; unique identifications towards life and a set of cultural differences (Hogan, Hogan & Roberts, 1996; McAdams & Pals, 2006). As can be understood from the definitions, personality is discussed in terms of specific traits and factors. The personality traits which were put forward by Eysenck (1967) on the basis of biological stimuli are classified as follows: extraversion, neuroticism, and psychosis.

According to Eysenck, being open to stimulation levels in people bring out different strategies. For example, those with high extraversion personality trait look for an environment with continuous stimuli; they try to keep stimuli trends higher. Consequently, they carry talkative, sociable, active, friendly qualities. On the other hand, people with high neurotic personality trait show intense emotional reactions; they are worried, anxious, shy, nervous, depressed and they tend to distrust other people even in normal times.

In addition, psychotic personality traits are considered to be associated with the androgen hormone. Accordingly, a relationship between personality and other factors such as attention, learning and the arousal levels of memory has been discovered. Furthermore, it has also been discovered that these stimuli have focused on a variety of factors (Daderman, 1999; Erdheim, Wang & Zickar, 2006). Although there isn't a complete agreement on the definition of personality traits, by taking into account certain factors, there seems to be a broad consensus over five universal factors which determine personality traits (Goldberg, 1990; Digman, 1990; Costa & McCrae, 1995, 1997; Ackerman & Heggestad, 1997; Busato et al. 1998; McCrae & Costa, 2005).

The Big Five Personality Traits

As a result of the increases in research on personality, personality psychologists have developed a measuring tool called Five Factor Personality Inventory (Five-Factor Model: FFM) by using factor analyses based on adjective-driven questions. This inventory is composed of five factors namely extraversion, agreeableness, conscientiousness, neuroticism/emotional stability, and openness (McCraea & John, 1992; Barrick and Mount, 1993; Busato et al., 1998; Heller, Judge & Watson, 2002; Burke & Witt, 2004; Harris &Lee, 2004).

Agreeableness

At one end of agreeableness, there are some typical personality traits such as compassion, self-sacrifice, emotional support and compassion; indifference, hostility, self-centeredness, and jealousy are present at the other end (Erdheim, Wang & Zickar, 2006; Barrick & Mount, 2001). People with high agreeable personality trait are reliable, straightforward, self-sacrificing, humble, while those with low compliance exhibit hostile, competitive, unreliable, stubborn, rude and skeptical personality traits (Bono, Boles, Judge & Lauver, 2002; Graziano, Jensen-Campbell & Hair, 1996).

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Conscientiousness

Conscientiousness personality trait is generally related to hard work, success-orientation, tenacity and mindfulness (Erdheim, Wang & Zickar, 2006; Barrick & Mount, 2001).This personality trait is closely associated with responsibility, being organized and success-orientation. While individuals with high responsibility are determined, ambitious, and success-oriented, individuals with low responsibility are unplanned, liable to procrastinating, and are considered to be undisciplined (Costa &McCrae, 1995).

Openness

Openness involves personality features such as scientific and artistic creativity, divergent thinking, imagination, originality, sophistication and a high sense of wonder (Erdheim, Wang & Zickar, 2006; Barrick & Mount, 2001). Among the big five personality traits, this trait involves the highest cognitive aspect. In this respect, individuals with a high level of openness to development are imaginative, adventurous, original, creative, curious, self-reflecting, while individuals with a lower level of openness are traditional, conservative, and are regarded as uncaring (Bond et al., 2002; Costa & McCrae, 1995).

Extraversion

One of the five-factor personality traits, extraversion involves assertiveness, the desire to be social, love of ambition, talkativeness, and aggressiveness (Barrick & Mount 2001). Individuals with high level of extraversion, factor are positive, social, energetic, cheerful, dominant, assertive, and caring to others, while individuals with low level of extraversion factor are defined as introverted, timid, quiet, and preferring solitude (Bond et al, 2002).

Neuroticism

Neuroticism is a state of anxiety, anger, hatred and mistrust (Barrick & Mount, 2001).Neurotic people tend to live in negative emotions such as guilt, irritability, sadness and fear. In this regard, high neuroticism individuals are anxious, insecure, withdrawn, and angry. On the other hand, people with low levels of neuroticism are comfortable, confident and patient (Costa & McCrae, 1995).

Learning Styles

Generally speaking, it is very hard to come to an agreement on definitions of concepts that are directly related to human beings. When it comes to define learning, which is innate in human nature, it is even harder to come up with one universally accepted definition (Shuell, 1986). However, there are common points in the statements trying to define human learning. First of all, learning involves some changes in behavior that result from experience (Taylor & MacKenney, 2008) and that endures over time (Schunk, 2012). Lafrancois (2000) restricts the definition by claiming that we can talk about learning if a relatively permanent change is not the result of fatigue, maturation, drugs, or physical injury. From these different perspectives we could deduce that learning is a relatively permanent change in human behavior that happens over time as a result of natural experience that people go through.

In the related literature, learning style is regarded as a way of learning. Learning styles consist of strategies such as superficial or deep processing of information, holistic and serial processing of knowledge, processing knowledge in details, retention and systematic recalling (Busato et al., 1998).

Learning styles can be regarded as a way which the individuals follow during the steps of receiving and processing information (Ekici, 2013). Accordingly, the most common learning styles are divided into three categories; deep processing of information, acquiring knowledge

and superficial knowledge. People who learn through deep information processing enjoy exploring as much as they can and also like being intrinsically motivated. Learners with high performance-orientation to acquire knowledge are extrinsically motivated in terms of learning behaviors due to the award which will come as a result of high performance. Finally, learners who embrace superficial learning styles focus on the minimum effort necessary to ensure success.

Research has shown that learning style shows a linear relationship between academic achievements. For example, while there is a positive relationship between deep learning and academic averages, superficial learning has a negative relationship with exam results (Chamorro-Premuzic and Furnham, 2008). Accordingly, to demonstrate the best learning style, a variety of learning style approaches have been developed. The best known among these is Kolb (1984)'s approach to learning styles. According to Kolb, learning is composed of two intersecting dimensions namely concrete experience (reflective observation, active experimentation), and abstract conceptualization; and four types of learning styles are mentioned namely, diverging, assimilating, converging, and accommodating (Busato et al., 1998; Gencel, 2007).

Diverging

Individuals with diverging learning style, concrete experience and reflective observation dimensions are dominant. These learners approach to concrete situations with different perspectives, and they organize relationships between events in a meaningful way. In a given situation, instead of taking action immediately, they make observations at first. They have developed thinking skills and are aware of meanings and values. These individuals, who take into account their own feelings and thoughts while configuring learning issues, have also developed creativity. They are quite successful at brainstorming activities when alternative ideas need to be created. They have strength in imagination, perception, identifying problems and evaluating them from different perspectives. However, they have hard times while choosing an option, or making decisions; at times, they are inadequate in taking advantage of learning opportunities (Aşkar & Akkoyunlu, 1993; Kolb, 1984, 1999; Ridin & Rayner, 1998).

Assimilating

Abstract conceptualization and reflective observation are in the foreground for individuals with such learning style. They are more interested in abstract concepts and ideas. Plan making and problem-solving skills are high. However, they are insufficient in practical studies and learning behaviors concerning practical values and ideas. These individuals also choose to receive the information from experts and see teachers as the most important source of information. Since they usually tend to learn by listening and observing, they are better with the traditional learning approaches (Aşkar & Akkoyunlu, 1993; Kolb, 1984, 1999).

Converging

Individuals with converging learning style use abstract conceptualization and active experiential learning paths. With these individuals, problem solving, logical analysis and deductive reasoning skills are higher. They are often interested in technical issues and are not attracted to social and interpersonal activities. They are quite good at exam questions with single answers, and they are more interested in the practical parts of ideas. They prefer to reach the correct information by trial and error and by applying what they learn, and they often require feedback from the teacher (Aşkar & Akkoyunlu, 1993; Kolb, 1984, 1999).

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Accommodating

For individuals with accommodating learning style, capabilities of learning through concrete and active life are in the foreground. Leadership abilities of these individuals are high and while they are learning they make use of interpersonal relationships and personal information of individuals rather than technical analysis. Their curiosity and research motivation are high and since they are sociable, they can easily communicate with other individuals. They are open-minded about learning and their capacity to adapt to change is high. If the theory put forth or a plan is incompatible with the facts, they usually abandon the plan (Aşkar & Akkouyunlu, 1993; Kolb, 1984, 1999).

The Relationship between Personality and Learning

The source of the relationship between personality and learning styles is based on the Theory of Personality Types Carl Jung (1927) (Ekici, 2013). Personality traits and learning styles are so intertwined with each other that personality shapes an important aspect of learning style. Learning strategies do not work on their own but are directly dependent on the learner's learning style and other personality variables (Cohen, 1996; Sadeghi, November, Tan & Abdullah, 2012). According to Schmeck (1988), learning styles should be considered and evaluated in the context of the overall personality factors such as introversion-extraversion, mindfulness-thoughtlessness, self-esteem, self-competence, productivity, anxiety and motivation (Schmeck, 1988).Studies in the literature (Busato, Prins, Elshout & Hamaker, 1998; Fallan, 2006; Furnham, Jackson & Miller, 1999; Kolb, 1984) showed that personality types have effects on learning styles.

Research on the role of personality in the learning process has increased rapidly especially in the last 20 years (Sadeghi et al., 2012; Threeton & Walter, 2009). For example, in a study conducted by Furnham (1992), statistically significant relationships were found between Kolb's learning style scores and psychoticism, neuroticism and extroversion (Furnham, 1992). This shows that the main factors of personality are closely related to learning styles.

In another study, Highhouse & Doverspike (1987) examined the relationship between college students' learning styles and personality types. In this study, Kolb's learning styles scale was used, and a significant relationship between learning styles and personality types was found (Highhouse & Doverspike, 1987).

Furnham and his colleagues (1999) have also addressed the relationship between personality and learning styles. In this study, learning styles are classified as, active (flexible, open-minded, optimistic), thoughtful (careful, thorough, thought-filled), theorist (logical, rational, objective) and pragmatic (practical, realistic, system), and the relationship between certain personality types and learning styles is also examined. The results of this study indicated that extroverted personalities have active, persistent and a relatively honest personality; and thoughtful, introspective and theorist personality types appeared to have low levels of psychosis. On the other hand, participants with pragmatic learning styles were found to be extroverted. As a result, a strong correlation was observed between personality types and learning styles (Furnham et al., 1999).

In another study, a positive relationship between open and extroverted personality traits and active-minded and responsive-intuitively learning styles was found. Specifically, a positive interdependent relationship was found between the extraversion and active-cautiousness and openness and sensitive-intuitive features (Sottilare, 2006).

In another study conducted by Rashid (2012), the participants were divided into four groups based on their learning styles as accommodating, converging, assimilating and diverging and

the relationship between assimilating learning style and personality traits was examined. In the study, it was concluded that agreeable personality trait was associated with assimilating type of learning style (Rashid et al., 2012). Kamarulzaman (2012) examined the relationship between personality-learning styles in the related literature and came to the conclusion that personality has effects on learning styles. He stated that extroverted individuals are particularly suitable for accommodating learning style.

Relationships between Honey and Mumford's "Learning Styles Scale" (LSQ) and Whetten and Cameron's "Cognitive Style Scale" (CST), and Kolb's "Learning Styles Inventory"(LSI) in relation with extrovert and neurotic personality traits were also detected. A positive relationship between Kolb's converger and accommodator learning styles and extraversion personality trait was observed. In addition, neuroticism was found to be negatively correlated with learning styles like assimilation and accommodation (Busato et al., 1998). Furham (1992) examined the relationship between Kolb's Learning Styles Inventory (LSI) and the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975) and detected statistically significant relationships between LSI and psychotism, neuroticism and extraversion.

These results revealed that the dimensions of LSI are directly related to the basic personality traits. Kolb's dimensions themselves are derived in part from Jung's theory of psychological types and partly from the Myers–Briggs Type Indicator (MBTI) which is one of the most widely used scales. Accordingly, Furham (1996) found statistically significant relationships between the big-five personality traits and MBTI personality factors (NEO Personality Inventory, Costa & McCrae, 1995). Other similar studies also show an overlap of the relationships between learning styles and personality traits. For example, it has been indicated that personality traits counts for a range of variance from 20% to 45%, in terms of learning behaviors. Accordingly, while openness affects deep learning, being focused on learning achievement is associated with responsibility (Chamorro-Premuzic & Furnham, 2008; De Raad & Schouwenburg, 1998).

IMPORTANCE

Research results in the field have shown that when the selection of staff and personality types, styles of teaching and learning processes comply with each other; thus, a more effective selection of staff and a higher quality of learning is realized (Buch & Bartley, 2002; Guion & Gottier, 1965; Schmit & Ryan, 1993; Ones & Viswesvaran, 1999; Rothstein & Goffin, 2006). On the other hand, determining individuals' personality traits according to their learning styles has been found to be effective in terms of both staff management and personal orientation (Vincent & Ross, 2001). In this regard, determining the most effective form of learning based on personality types is of great importance, and if it is ignored, a set of problems in the process of achieving the desired level of performance may be unavoidable (Fallan, 2006).

Studies performed to determine learning styles and personality types to meet the learning needs also provide valuable information about the relationship between learning styles and personality types. With the results obtained from the current study, training programs can be configured to meet the needs of staffs and students, and thus progress can be made. With the synchronization of personality types and learning styles, organizational staff and students can be provided with comprehensive experience. At the same time, more effective development opportunity can be provided to organizations, management, human resources practitioners, teachers and program developers that want to enrich educational activities and their curriculum, and in this way, organizational effectiveness can be increased. (Threeton & Walter, 2009).In the literature, although there are studies suggesting that there is a

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relationship between personality types and learning styles, these insights should not be considered proven empirically unless they are statistically tested. Therefore, further quantitative studies demonstrating the relationship between these two concepts will be needed (Furnham et al., 1999; Kamarulzaman, 2012; Sadeghi et al., 2012).

RESEARCH OBJECTIVES

The aim of this study is to examine the relationship between learning styles and personality profiles of individuals. For this purpose, the following research questions will be answered:

1. What are the learning styles of the participants?
2. What are the personality profiles of the participants according to the dimensions of personality?
3. Is there a significant relationship between participants' personality profiles and their learning styles?

METHOD

This research was carried out with a descriptive relational model. In these models, the aim is to determine the presence and/or the degree of the change between two or more variables (Karasar, 2003).

The Participants

In the study, 460 students from University of Gaziantep (Faculty of Economics and Administrative Sciences and Faculty of Education) were randomly selected and were given questionnaires. After the removal of invalid ones, 421 questionnaires were evaluated in total. The population was composed of 58% female (N = 245) and 42% male (N = 176) participants.

Measuring Tools

The Big-Five Personality Inventory

The big-five personality inventory was developed by Benet-Martinez and John (1998). The inventory consists of 44 items that measure "neuroticism", "extraversion", "openness", "agreeableness" and "conscientiousness" factors. In the inventory, the 5-point Likert-type questions take values within a range from 1 (strongly disagree) to 5 (strongly agree). The five broad aspects of the inventory are considered to be a relative upper typology that encompasses personality dimensions. (Goldberg, 1990; Costa & McCrae, 1995).As a comprehensive model of personality, this inventory is widely used in the prediction of the results of variables stemming from corporate behaviors (Salgado, 2002).The Turkish version of the scale was adapted by Sümer, Lajunen & Özkan (2005), and the scale factors were determined to be ranging from .64 to .77 for the Cronbach's alpha reliability value, which meant that the scale was moderately reliable. This particular scale was used in the current study because it is brief and concise, which makes it suitable to be implemented in different cultures (Benet-Martinez &John, 1998).

Kolb's Learning Style Inventory

In the current study, Kolb Learning Style Inventory (KLSI 3.0, Kolb, 1999), which is widely used and accepted as a measuring tool, was used to determine the learning styles of the participants (Gencel, 2007). It was adapted to Turkish by Gencel (2007), and Cronbach's alpha reliability values were found to vary between .71 and .84. It consists of four dimensions namely, concrete experience (CE), active experimentation (AE), reflective observation (RO)

and abstract conceptualization (AC). In the scale, there are 12 items and each item has four options (a, b, c, d).Each option represents a dimension in the scale. In the process of implementation of the survey, participants were asked to mark among four options, the most appropriate being "4" and the least "1".Thus, in the scale the lowest score comes to 12, and the maximum score is 48 for each item. These scores are then converted into combined scores as (CE-AC) and (AE - RO). By using these scores, the individuals are assigned to one of the learning styles. Positive scores of (CE-AC) indicate that the learning is concrete; negative scores indicate abstract learning. In the same way, (AE - RO) scores indicate whether the individual is an active learner or a reflecting one (Gencel, 2007).

Data Analysis

SPSS 15 statistical analysis software was used to analyze the data. In order to answers the research questions, cluster analysis and chi-square test were used; some basic statistical analysis techniques such as frequency, percentage and standard deviation of the distribution were also employed. In the analysis, the significance value (p) was taken as .05. In the study, cluster analysis was conducted to determine the distribution of participants in terms of personality profiles. Classification is an important component of almost any kind of scientific research. The basic purpose of cluster analysis, one of the two methods used to classify, is to uncover groups which are not subject to any initial classification, based on the observed values of the data (Landau & Everitt, 2004).Cluster analysis is used to separate participants into similar and homogeneous sub-groups (Cohen, Manion & Morrison, 2007). In SPSS K-means clustering method was used. K-means clustering method is used to separate the observed data into a number of groups determined by the researcher (Landau & Everitt, 2004).In this method, the data is divided into the specified number of groups with as much variety as possible. Once the cluster analysis is performed, the next step is to ensure its validity. At this stage, different statistical techniques such as v-folds cross-validation method (Hill & Lewicki, 2007), mean comparison or ANOVA test (Burns & Burns, 2008; Everitt, Landau, Leese& Stahl, 2011), discriminant analysis and MANOVA (Aldenderfer & Blashfield, 1984; Landau & Everitt, 2004) can be used.

In this study, in order to test the validity of the clusters one-way analysis of variance (ANOVA) test was used. In order to test the meaningfulness of the relationships between learning styles and personality traits, the chi-square test was used. Chi-square is used to test whether there is a relationship between two categorical variables (Cronk, 2008). To put it in other way, Chi-square testis used to determine whether or not observed and expected values of two categorical variables are significantly different from each other (Büyüköztürk, 2012).

RESULTS AND DISCUSSIONS

In the initial research process, learning styles of the participants were determined and related distribution frequency and percentages are given in Table 1.

Table 1. Distribution of the Participants According to Their Learning Styles

Learning style	*N*	*%*
Diverging	71	16.9
Assimilating	138	32.8
Converging	150	35.6
Accommodating	62	14.7
Total	*421*	*100*

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From Table 1, it can be understood that, 32% and 35.6 percent of the participants adopt assimilating and converging learning styles respectively. The common feature of these two learning styles, represented with a significant portion, is that they are both related to abstract conceptualization. Individuals who choose abstract conceptualization usually work or study alone. During the process of learning, since these individuals perform analysis of situations or concepts, they prefer to learn by reflecting on what they are doing.

To answer the other research question of the study related with the determination of the participants' profiles, K-means clustering analysis was performed. In Table 2, means derived from the scale factors of each cluster, the number of the participants in each cluster, and related percentages given.

Table 2. K-Means Clustering Analysis Results of Five Factors Personality Traits' Scale

Personality factors	*Means*	
	Cluster 1	*Cluster 2*
Extraversion	3.08	3.86
Agreeableness	3.53	4.12
Conscientiousness	3.30	4.02
Neuroticism	3.36	2.62
Openness	3.34	4.00
N	*197*	*224*
%	*47%*	*53%*

It is clear from Table 2 that with the scale factors two different clusters were obtained. Looking at the frequency distributions (N) and percentage (%) values, it can be seen that 47% (N = 197) of the participants fall into the 1st cluster, and 53% (n = 224) of them into the 2ndcluster. To determine the validity of cluster analysis, one-way analysis of variance (ANOVA) was performed and related results are given in Table 3.

Table 3 (Part-I). Cluster Analysis Validity Test - ANOVA Results

Personality Factors		*Sum*	*df*	*Means*	*F*	*Sig.*
Extraversion	Between groups	63.336	1	63.336	188.992	0.000
	Within groups	140.418	419	0.335		
	Total	203.755	420			
Agreeableness	Between groups	36.037	1	36.037	119.228	0.000
	Within groups	126.643	419	0.302		
	Total	162.68	420			
Conscientiousness	Between groups	55.135	1	55.135	193.96	0.000
	Within groups	119.105	419	0.284		
	Total	174.239	420			

Table 3(Part-II). Cluster Analysis Validity Test - ANOVA Results

Personality Factors		*Sum*	*df*	*Means*	*F*	*Sig.*
Neuroticism	Between groups	57.236	1	57.236	146.907	0.000
	Within groups	163.246	419	0.39		
	Total	220.482	420			
Openness	Between groups	45.85	1	45.85	177.744	0.000
	Within groups	108.083	419	0.258		
	Total	153.932	420			

Table 3 reveals that a significance for each factors was observed ($p < .05$). In other words, the cluster analysis is valid because the clusters were found to be significantly different from each other (Burns & Burns, 2008, p. 558).In addition, two factors with high F values, "extraversion" ($F = 188.992$, $p < .05$) and "agreeableness" ($F = 193.960$, $p < .05$), were observed to be of major importance in forming the clusters when compared to the other factors. In the study, mean scores for each of the factors are classified as "low" and "high", and the results are presented in Table 4.

Table 4. Personality Factors According to Profiles

Personality Factors	*Profile 1*	*Profile 2*
Extraversion	Low	High
Agreeableness	Low	High
Conscientiousness	Low	High
Neuroticism	High	Low
Openness	Low	High

From table 4, it is clear that the individuals in Profile 1 have high levels of neuroticism. In contrast, it can be observed that extraversion, agreeableness, conscientiousness and openness exhibit low levels of neuroticism. From Profile 2, it can be understood that although the participants reveal a high level of extraversion, agreeableness, conscientiousness, and openness, they also have a low level of neuroticism. As can be seen, two profiles that appear to be opposite with each other in terms of personality factors have emerged. The distribution of these two profiles appear to be close to each other with 47% (N = 197) for Profile 1 and 53% (N = 224) for Profile 2.Chi-square test results, which reveal the relationship between learning styles and personality profiles, are given in Table 5.

According to the results of the chi-square test presented in Table 4, the distribution is statistically significant ($X2$ (3, N = 421) = 12.87, $p < .05$). In other words, a significant relationship is present between learning styles and personality profiles. In addition, to determine the strength of association, the Cramer's V test was performed and a weak relationship between learning styles and personality profiles was detected (Cramer's $V = .175$, $p < .05$).

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Table 5. Chi-square- Test Results between Learning Styles and Personality Profile

Personality Profile		*Learning Style*				*Sum*
		Diverging	*Assimilating*	*Converging*	*Accommodating*	
Profile 1	Observed	41	75	57	24	197
	Expected	33.22	64.57	70.19	29.01	197
	%	20.81%	38.07%	28.93%	12.18%	100%
Profile 2	Observed	30	63	93	38	224
	Expected	37.78	73.43	79.81	32.99	224
	%	13.39%	28.13%	41.52%	16.96%	100%
Sum	Observed	71	138	150	62	421
	Expected	71	138	150	62	421
	%	16.86%	32.78%	35.63%	14.73%	100%

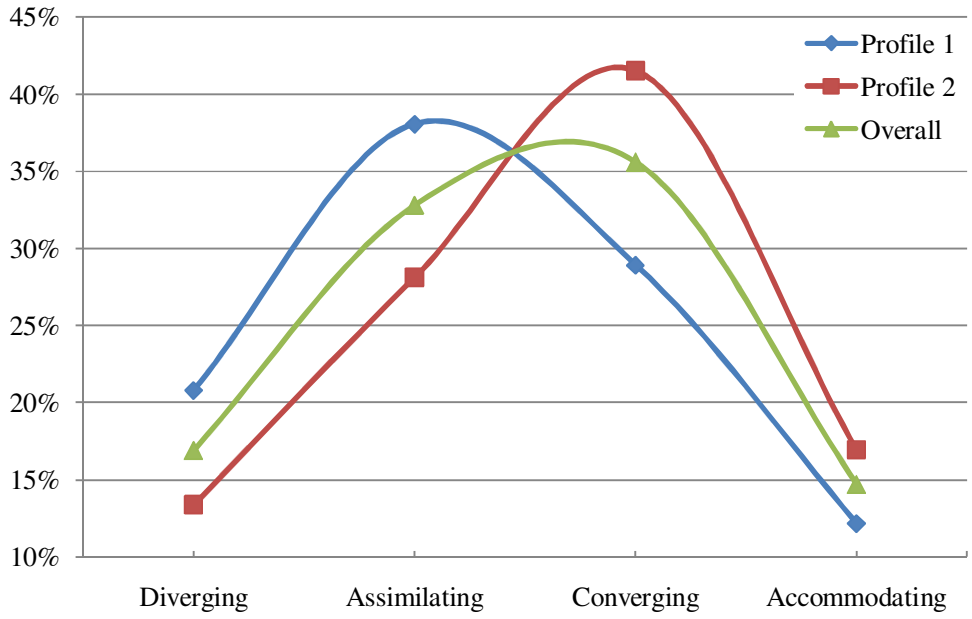

Figure 1. The distribution of learning styles-personality profiles

Figure 1 illustrates the distribution of learning styles throughout the obtained profiles and sampling. An analysis of Graphic 1 will reveal that, compared to the general distribution, the distribution in the Profile 1is skewed to the right, and the distribution in Profile 2 is skewed to the left. In Profile 1, when the individuals are examined in terms of learning styles, the distribution seems to be skewed to the right, which means that the participants have a preference towards assimilating learning style.

Individuals with these tow learning styles prefer reflective observation in the process of learning. In these cases, learning takes place through careful observation, looking from different angles, looking for meanings by observing and listening. These individuals are more successful in learning environments where lectures are given and then relevant knowledge is tested. (Aşkar & Akkoyunlu, 1993; Kolb, 1984, 1999).When Profile 2, individuals with low levels of neuroticism, is analyzed in terms of learning styles, it can be seen that they have a tendency towards diverging and accommodating. The key feature of these two learning styles is that these learners prefer active learning. Individuals with this type of learning style have a tendency towards practical applications and adoption of what works best instead of observation. They are results-oriented and they prefer to learn by doing (Aşkar & Akkoyunlu, 1993; Kolb, 1984, 1999). As a result, individuals with high levels of extraversion, agreeableness, conscientiousness, and openness and low level of neuroticism have diverging and accommodating learning styles, and it can be claimed that they like hands-on experiences and prefer to learn by doing. These results are also in line with other studies in the field. For example, in a study conducted by Busato et al. (1998) revealed a positive relationship between extraversion and diverging and accommodating learning styles (Busato et al., 1998).In addition, in a study on the relationship between learning styles and personality, Kamarulzaman (2012) states that individuals with extroverted personality trait adopt the accommodating learning style.

RECOMMENDATIONS FOR FUTURE STUDIES

In this study, the relationship between personality traits and learning styles are addressed. The study is limited with the students at Gaziantep University. Similar studies, with larger samples of different groups and different statistical methods and variables can contribute to the related literature.

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