European Online Journal of Natural and Social Sciences 2013;
Vol.2, No.2 Special Issue on Teaching and Learning.
ISSN 1805-3602

On the Network of Associations among EFL Learners' Language Learning Strategies, Mindfulness and Personality Traits: A Structural Equation Modeling Approach

Reza Khany (Corresponding author)
English Department of Ilam University, Ilam, Iran
Khani_Reza@yahoo.com
and
Neda Babanezhad Kafshgar
English Department of Ilam University, Ilam, Iran

Abstract

Language learning strategies, personality traits and mindfulness represent three individual learner characteristics that appear to play a crucial role in learners' success or failure in EFL contexts. The main purpose of this study was to scrutinize the network of associations among these three variables and their respective sub-scales. We used Strategy Inventory of Language Learning (SILL), the Big Five Inventory (BFI), and Mindful Attention Awareness Scale (MAAS) to measure the variables. The results of Structural Equation Modeling (SEM) analysis confirmed the hypothesized model of relationships among the study variables. The final model of the network of associations among variables also revealed significant correlations among various sub-scales of the study. The findings of this study have various implications for language teachers and psycholinguistic researchers.

Key words: language learning strategy, personality trait, mindfulness, network of associations

1. Introduction

Central to the entire discipline of language learning is the concept of learners' individual characteristics. Language learners contribute to the process of language learning through their individual characteristics. A growing body of literature has been written on the significant role that learners can play in the total development of language learning (Ellis, 1985, 2004; Oxford & Nyikos, 1989; Oxford & Cohen, 1992; Dewaele and Furnham, 1999; Brown, 2000; Dörnyei, 2005, 2009).

Different aspects of learning have been linked to a number of learners' individual characteristics such as age (Johnson and Newport, 1989; DeKeyser, 2000; Birdsong, 1999; Bongaerts, 1999); gender (Ehrman and Oxford, 1989; Oxford and Nyikos, 1989; Oxford and Ehrman, 1995); motivation (Ellis, 1985; Schmidt et al., 1996; Engin, 2006; Horwitz, 1990; Hamilton, 2001; Locastro, 2001); personality (Oxford and Nyikos, 1989; Oxford, 1994; cook, 2008; Costa and McCare, 1992; John, 1990; McCare and John, 1992; Ely, 1986; Reiss, 1983; Strong, 1983; Gass & Selinker, 1994); learning styles and strategies (Oxford, 1990, 1994; Wong and Nunan, 2011; Oxford and Anderson, 1995; Reid, 1987, 1995; Anderson, 2005; Cohen, 1998; Oxford and Burry- Stock, 1995; Oxford and Ehrman, 1995; Ely and Pease-Alvarez, 1996; Oxford, 2001, 2003; Rossi -Le, 1995).

Among the studies being done, some seem to be partially attended to in the previous study. However, few studies can be found to have addressed the issue of language learning strategies in combination with other factors such as learners' personality and mindfulness. Learners' performance has been reported to be affected by such factors in many studies (Salomon and Globerson, 1987; Langer, 2000; Hyland, 2008). Unlike learners' strategies and personality traits, mindfulness as a representative property of learners' attention status has been rarely the focus of studies. Although recent

developments in educational psychology have heightened the need for taking the role of learners' characteristics into account, far too little attention has been paid to the interrelations of these individual factors. This study sought to remedy this problem by exploring the nexus of relationships among learners' language learning strategies, mindfulness and personality traits.

1.1 Language learning strategies

Strategies, as defined by Brown (2000), are specific methods of approaching a problem or task, modes of operation for achieving a particular end, planned designs for controlling and manipulating certain information and they might vary moment to moment, or day to day, or year to year. As Wong& Nunan (2011) claim, every task and exercise will be underpinned by at least one strategy. Oxford (1990) also defined the concept as operations which learners employ to help them with the acquisition, storage, retrieval, and use of information. She further identifies six broad categories of strategies: metacognitive (e.g. self-monitoring, paying attention); affective (e.g. self-encouragement, anxiety reduction); social (e.g. ask questions, become culturally aware); memory (e.g. grouping, imagery, associating); cognitive (e.g. reasoning, analyzing, and summarizing); compensation (e.g. guessing meanings, using synonyms).

A review of the relevant literature considering language learning strategies indicates that over decades of research in this field, this issue has been linked to many aspects of language learning such as learning styles (Ehrman and Oxford, 1990; Oxford, 1990b, 2001, 2003; Rossi -Le, 1995; Ely and Pease-Alvarez, 1996; Carson and Longhini, 2002; Ehrman et al., 2003), language proficiency (Chang, 1990; Green and Oxford, 1995;Park, 1997; Chen, 2002), and motivation(Oxford and Nyikos,1989; Tamada, 1996) among others. In a nutshell, research in the area of language learning strategies has resulted in a wealth of information with respect to the concept of strategy use by learners with different proficiency levels, motivation categories and learning styles. However, little research has been reported to link learners' language learning strategies to their mindfulness status. Although some researchers have tried to relate different aspects of learning to mindfulness (Salomon& Globerson, 1987; Langer, 1997; Langer, 2000; Hyland, 2008; Yeganeh &Kolb, 2009; Hillgaar, 2011), the research to date has tended to focus on the whole concept of learning rather than language learning strategies.

1.2 Mindfulness

Research on mindfulness has increased dramatically and received specific attention in both the clinical and empirical domains. Mindfulness is increasingly recognized as a phenomenon with functional import for outcomes as diverse as physical health, psychological well-being, work and sport performance, and relationships (Brown & Ryan, 2004). Modern clinical investigators and meditation teachers have offered different definitions of mindfulness (Baer, 2003; Bishop et al., 2004; Germer et al., 2005; Kabat-Zinn, 2003; Salzberg and Goldstein, 2001). According to (Kabat-Zinn, 1994) mindfulness is ‘‘paying attention in a particular way: on purpose, in the present moment, nonjudgmentally” (p.4).

Bishop et al. (2004) proposed a two-component model of mindfulness, consisting (a) attention and awareness and (b) acceptance. Awareness is the pure apperception and perception of the field of events that encompass our reality at any given moment. As Allport (1988) suggested, three conditions must be met in order for a person to be aware of a given experience. First, the person must show a behavioral or cognitive change as a result of the experience. Second, the person must report that he/she was aware of the experience at the time it took place. And third, the person must be able to describe the experience. According to Tomlin and Villa (1994), attention is a limited capacity system which constitutes a process of selection and involves controlled rather than automatic processing of information and a process of coordination among competing stimuli and responses.

Acceptance refers to receptively seeing things as they actually are in the present moment (Kabat-Zinn, 1990, cited in Giluk, T. L., 2009). Each moment is viewed as unique, and if one brings to the moment preconceived ideas, he won't be able to experience the moment as it really is. Awareness and attention are, of course, the primary features of conscientiousness and are central to mindfulness and also believed to be essential for detecting discrepancies between current states or levels of functioning (Bowlin& Baer, 2012).Mindfulness specifically concerns the monitoring, observing capacity of conscientiousness. Mindfulness, in its mode of operation, is perceptual, operating upon thought, as well as upon emotion and other contents of conscientiousness. Yeganeh & Kolb (2009) developed this exploration further by making a distinction between two predominant streams of mindfulness research and practice; meditative mindfulness and socio-cognitive mindfulness. Meditative mindfulness requires a discipline of anchoring the mind in the present moment. This is often accompanied with a practice of awareness and acceptance through breathing. Socio-cognitive mindfulness emphasizes cognitive categorization, context and situational awareness. They argue that Meditative mindfulness is often measured by Brown & Ryan's Mindful Attention Awareness Scale) MAAS) (Brown & Ryan, 2003) and socio-cognitive mindfulness is measured by the Langer Mindfulness Scale (LMS).

1.3 Learning and mindfulness

According to Salomon & Globerson (1987), the gap between what learners can do and what they actually do can be narrowed down to a great extent by the notion of mindfulness. Mindfulness is a mid-level construct which reflects a voluntary state of mind, and connects among motivation, cognition, and learning. Langer (2000) argued that mindfulness, achieved without meditation, is discussed with particular reference to learning. Being mindful is the simple act of drawing novel distinctions. It leads us to greater sensitivity to context and perspective, and ultimately to greater control over our lives. Hyland (2008) asserted that as a dimension of the learning process, mindfulness practice can effectively link all forms of learning with the needs, interests and values of learners thus fostering engagement and motivation.

Although the relationship between mindfulness and learning has been tackled theoretically (Salomon& Globerson, 1987; Langer, 1997), the practical aspects of this relationship have been addressed only, recently. Yeganeh &Kolb (2009) explored this relationship with respect to experiential learning and operating on Experiential Learning Theory (ELT) they found links between learning from experience and mindfulness, and also found that individuals who scored high on Langer's mindfulness scale emphasized direct concrete experience in their learning style. Thus, the results suggested that the practice of mindfulness could help individuals learn from experience. Hillgaar, S. D. (2011) investigated the association between mindfulness and self-regulated learning. The correlations between the different measurements revealed the facets of mindfulness to be positively correlated with self-regulated learning, and negatively correlated with test anxiety. Mindfulness becomes important when we consider how we choose to process and learn from the events in o ur lives. Nunan (1999) argued that knowledge of strategies is important, because the greater awareness you have of what you are doing, if you are conscious of the processes underlying the learning that you are involved in, then learning will be more effective.

1.4. Learning and personality traits

As Barrick, Mount, & Judge (2001) suggested, the well-established five-factor (Big Five) model of personality consists of the traits neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Although there is a rich body of literature which advocates this five-factor model of personality, researchers don't always agree on the exact definition for each trait. However, these five categories are usually described as follows (John & Srivastava, 1999):

Extraversion involves characteristics such as talkative, energetic, and assertive; Agreeableness includes properties such as sympathetic, kind, and affectionate; Conscientiousness entails organized, thorough, and planful traits; Neuroticism relates to tense, moody, and anxious states ; Openness includes characteristics such as imagination and insight.

Costa & McCrae (1992) proposed that it is widely accepted that the Big Five personality traits are the cause of most of the individual differences in behavioral patterns. Thus, it seems logical to study these traits as major sources of individual differences in learners' performance in academic settings (Chamorro-Premuzic& Furnham, 2008; Furnham & Monsen, 2009; Nguyen, Allen& ,Frac-castoro, 2005; O'Connor & Paunonen, 2007).

Besides the direct effect, learners' personality factors may also contribute to the explanation of differences in other important predictors of academic performance like approaches to learning, learning strategies, cognitive abilities, and academic motivation (Barrick & Mount, 1996; Bidjerano & Yun Dai, 2007; Clark & Schroth, 2010; Diseth, 2003; Swanberg& Martinsen, 2010, Kang, 2012). Cohen (1998) quoted from Brown that learning strategies do not operate by themselves, but rather are directly tied to the learner's underlying learning styles and other personality related variables in the learner.

1.5 Personality traits and mindfulness

Recently, researchers have shown an increased interest in relating different personality traits to various factors of mindfulness. Among Big Five personality traits, Neuroticism showed the most powerful negative relationship with mindfulness (Feltman et.al, 2009, Kostanski, 2007, Hurk et al., 2011, Latzman & Matsuda, 2013). Neurotic persons are anxious, insecure, moody and self-conscious (Barrick, Mount, & Judge, 2001). Costa and McCrae (1992) also proposed that the neuro-ticism dimension assesses adjustment or emotional stability versus maladjustment or neuroticism. Highly neurotic individuals will experience emotional instability and will show characteristics of worrying, fear, guilt, sadness, anger, embarrassment, and disgust. Since mindfulness is associated with psychological well-being mental health and self-regulated functioning, it can be predicted that neuroticism is negatively related to mindfulness.

According to Barrick et al. (2001) extraversion consists of sociability, dominance, ambition, positive emotionality and excitement-seeking. All of these properties seem to be positively related to mindfulness except for excitement –seeking (Costa &McCrae, 1992). Thus the direction of relation-ship remains. Barrick et al. (2001) defines openness to experience as a concept of intelligence, crea-tivity, unconventionality, and broad-mindedness. According to Costa &McCrae (1992), open per-sons are curious about themselves and the outer world. This property seems to go with attention and awareness which are central issues in mindfulness. Key words in defining the concept of agreeable-ness are cooperation, trustfulness, compliance and affability (Barrick et al. 2001) also seems to cor-relate positively with acceptance and receptivity issues of mindfulness (Kabat-Zinn, 1990, cited in Giluk, T. L., 2009). Conscientiousness is associated with dependability, achievement striving, and planfulness (Barrick et al. 2001). These characteristics seem to positively relate to focusing and de-liberateness issues in mindfulness (Kabat-Zinn, 1990, cited in Giluk, T. L., 2009, Costa &McCrae, 1992, Latzman & Matsuda, 2013). However, controversial findings also exist in literature (Hurk et al., 2011).

1.6 The current study

As it is revealed by the aforementioned literature, learners' language learning strategy use, mindfulness status and personality dimensions have been linked to each other from different pers-pectives. So far, however, there has been little discussion about the interrelationships of these three concepts studied simultaneously. Furthermore, the research methods used to date lack a unified

theory behind. Most of the studies reported do not draw upon the more robust methodological designs and models which can give a more precise and inclusive pictures of the associations of the variables in the study. One such model is structural equation modeling. Such gaps kindled the researchers to explore the network of associations amongst learners' language learning strategies, mindfulness status and personality traits. Hence, in the light of previous findings, we expected significant relationships among these three variables and also their various sub-scales and based on these expectations we proposed a model in which all of these three learner variables are correlated to each other (Figure 1). In order to investigate the relationships in detail and probe into the interrelationships of various sub-scales of the study, we conducted a structural equation modeling approach. According to Bollen and Long (1993), Structural Equation Modeling (SEM) is a powerful multivariate analysis approach which is performed to both validate the measurement model and fit the structural model. These are analyzed through exploratory and confirmatory phases the result of which is reported in the following sections.

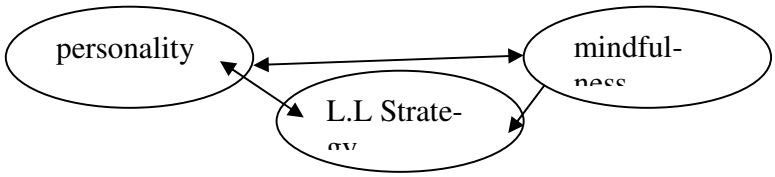

Figure 1. The hypothesized model of the relationships among main variables of the study.

2. Method

2.1 Participants and procedure

384 (136 male and 248 female) EFL learners participated in this study. They were drawn from two state universities in Iran; Ilam University and Mazandaran University. Their mean age was 23.59 years (SD= 4.77). All the participants had at least 3 to 5 years of experience in language learning. All the subjects of the study were invited to participate in the survey without any financial reward. They were ensured about their privacy concerns. Willing participants were given an anonymous pack of survey pages which contained of all of the questionnaires used in the study.

2.2 Instruments

Three self-report questionnaires were used in this study.

2.2.1 Strategy inventory for language learning (SILL) developed by Oxford (1990) is a 50-items self -report questionnaire that has been used extensively by various researchers. Oxford (1996) reported high reliability, validity and utility indexes for the measure. This 50 likert-type questionnaire, which is designed to obtain information concerning language learners' strategy use in second language situations, covers six subscales of language learning strategies that include memory(9 items), cognitive(14 items) , compensation(6 items), meta-cognitive(9 items), affective(6 items), and social strategies(6 items). As suggested by Ellis (1994), this is the most comprehensive classification of learning strategies to date. The questionnaire was translated into Persian and adapted to our research context. The Persian adapted version of SILL was used in this study to obtain information regarding learners' language learning strategies.

2.2.2 Mindful Attention Awareness Scale (MAAS) which is one of the most popular measures of mindfulness is a 15-item scale. Participants respond to each item on a 6-point Likert scale from ‘‘almost always” to ‘‘almost never”. According to Brown and Ryan (2003), this scale is designed to assess a core characteristic of dispositional mindfulness, namely, open or receptive awareness of and attention to what is taking place in the present. This questionnaire covers two subscales which con-

tain attention (10 items) and awareness (5 items). This scale was also translated into Persian and was adapted to our participants' situational and cultural specific requirements.

2.2.3 Big Five Inventory (BFI) proposed by John and Srivastava (1999) is a likert-type scale which is designed to measure different personality traits. This 44-items questionnaire covers five subscales which include neuroticism (8 items), extraversion (8 items), openness to experience (10 items), agreeableness (9 items), and conscientiousness (9 items). The participants were asked to respond to each item on a 5-point Likert scale from ‘‘strongly disagree” to ‘‘strongly agree”. This questionnaire was also translated and adapted to the context of study.

2.3 Data analysis

In order to explore the relationships assumed in our hypothesized model, using the AMOS 21 program, we tested the model by means of SEM (structural equation modeling) analyses. At the first step and in an exploratory approach to analyze our data, we conducted Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity to validate the sub-scales or observed variables which we considered for each of our main or latent variables. The second step was devoted to validation of the full posited model (the main variables and their sub-scales) through a confirmatory statistical approach referred to as the goodness of fit. In order to estimate how the supposed relationships among model's variables fit the data, various conventional fit indices were calculated. Following Tseng et al. (2006), we chose root mean square error of approximation (RMSEA), root mean squared residual (RMR), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normal fit index (NFI), comparative fit index (CFI), incremental fit index (IFI) as well as normal chi-square as indices of good model fit. Values of GFI, NFI, CFI, and IFI> 0.90 are considered to be acceptable fitness indices. The acceptable value for AGFI is greater than 0.85 and for RMR is equal or greater than 0. This index for RMSEA is greater than 0.05 and in case of normal chi-square the acceptable value is greater than 5 (Bollen, 1989; Steiger, 1990; Hu & Bentler, 1999; Byrne, 2001). We then explored the significant relationships among the main variables and subscales of our proposed model. In so doing, along with estimating goodness of fit indices and the matrix of correlations, multiple regression analyses were run to reveal the model path predictions. In the following section, the results are reported at length.

3. Results

Descriptive statistics of all measures are shown in Table 1.

Table 1. Descriptive statistics for all measures

Variables	N	Mean	SD	Skewness	Kurtosis	Z	Sig.
Personality traits							
Extraversion	384	3.20	0.573	-.012	-.486	2.059	0.000
Agreeableness	384	3.69	0.464	-.122	-.320	1.656	0.008
Conscientiousness	384	3.45	0.589	.244	-.025	1.412	0.037
Neuroticism	384	2.87	0.655	.177	-.951	1.852	0.002
Openness	384	3.36	0.523	-.002	.184	1.906	0.001
L.L. Strategies							
Memory	384	3.13	0.652	.242	-.175	1.552	0.016
Cognitive	384	3.22	0.542	-.686	.618	1.908	0.001
Compensation	384	3.25	0.654	-.211	.013	1.897	0.002
Meta cognitive	384	3.65	0.731	-.682	.899	1.926	0.001
Affective	384	3.10	0.734	-.044	.234	1.989	0.001
Social	384	3.40	0.667	-.181	.617	2.185	0.000
Mindfulness							
Attention	384	3.26	0.688	-.161	-.128	1.707	0.006
Awareness	384	3.30	0.849	.068	-.709	1.366	0.048

As it can be inferred from Table 1, all of the variables were not normally distributed, thus, Spearman coefficients were calculated. Table 2 represents correlation matrix of all of the sub-scales of the study.

Table 2. Correlation matrix of the study variables

Sub-scales	1	2	3	4	5	6	7	8	9	10	11	12	13
Personality													
1.Extraversion	-												
2.Agreeableness	.055	-											
3.Conscientiousness	.033	.420**	-										
4.neuroticism	-.028	-.444**	-.110*	-									
5.openness	.296**	.086	.036	.002	-								
L.L. Strategies													
6.memory	.033	.096	.134**	-.183**	.135**	-							
7.cognitive	-.048	-.117*	.057	.058	.157**	.453**	-						
8.compensation	.026	-.158**	-.076	-.198**	-.004	.209**	.401**	-					
9.meta cognitive	-.114*	.036	.175**	-.044	.117*	.407**	.541**	.299**	-				
10.affective	.002	.143**	.227**	-.114*	.131*	.339**	.468**	.423**	.563**	-			
11.social	-.093	.010	.113*	-.146**	.159**	.265**	.533**	.215**	.594**	.448**	-		
Mindfulness													
12.Attention	-.088	.370**	.357**	-.295**	.103*	-.119*	.134**	.172**	.052	-.019	.023	-	
13.Awareness	.021	.221**	.223**	-.220**	.017	.093	-.012	.268**	-.038	-.084	-.143**	.569**	-

p<.05 p**<.01*

As it can be figured out from Table 2, in addition to the intra-scale relationships among various sub-scales of our main variables, there were a number of significant links among different subscales of distinct main variables. Memory strategy was correlated to openness and conscientiousness personality traits positively and to neuroticism trait and attention negatively. Cognitive strategy was linked to openness in positive and to agreeableness in negative direction. There was also a positive correlation between this strategy and attention mindfulness. Compensation strategy had negative relationships with neuroticism personality trait and positive relations with both attention and awareness mindfulness. It was also linked to agreeableness negatively. Meta-cognitive strategy was correlated to extraversion negatively and to conscientiousness and openness positively. Affective strategy demonstrated significant positive relationships to agreeableness, conscientiousness, and openness as well as negative links to neuroticism. Social strategy indicated positive correlations to conscientiousness and openness personality traits and negative correlations to neuroticism and awareness. Also attention and awareness mindfulness were negatively correlated to neuroticism and positively to agreeableness and conscientiousness. Attention mindfulness was also positively related to openness. Although multiple relationships were found among various subscales of different variables, simple correlation analysis couldn't be accounted as a strong confirmatory measure to suggest accuracy of these relations in the network of associations among different components of our hypothesized model. Therefore, the researchers decided to probe into the significant relationships in the network of associations via SEM (structural equation modeling) procedure in exploratory and confirmatory phases.

Since each of our substantial variables encompassed multiple sub-scales, validation of these factors was necessary. At the exploratory phase of our analysis and in order to ensure about sufficiency of sampling and appropriateness of the factor model for each of our main variables, we used KMO measure of sampling adequacy and Bartlett's Test of Sphericity. As it is shown in Table 3, all of the statistics for KMO measure were greater than 0.5 which conveyed sufficiency of sampling. Furthermore, confidence level of 0.000 for Bartlett's test signified appropriateness of factor model for all of our main variables.

Table 3 which represents KMO and Bartlett's test results, indicated that each set of sub-scales appropriately measured their respective variables. The next phase of our analysis included a confirmatory approach to examine accuracy of the relationships among the study main variables as well as the links among various sub-scales. In order to ensure about the fitness of our hypothesized model to the collected data, it was necessary to perform a confirmatory factor analysis with the help of AMOS 21 program. The calculated fitness indices (Table 4) indicated that our posited model of the relationships among study main variables fitted the data ($x^2/_{df}$=1.082, RMSEA=0.015, RMR= 0.016, GFI= 0.981, AGFI= 0.962, NFI= 0.970, CFI=0.998, IFI=0.998).

Table 3. KMO and Bartlett's Test of study variables

Variables		L.L. Strategies	Personality	Mindfulness
KMO measure of sampling adequacy		0.782	0.789	0.500
Bartlett's Test	χ^2	872.556	2423.183	142.471
	d.f.	15	10	1
	Sig.	0.000	0.000	0.000

Table 4. Structural equation model: fit statistics

Fit statistics	Acceptable level	Current level	Evaluation
Normal chi-Square	$\left(x^2/_{df}\right) < 5$	1.082	Accept
Root Mean Squared Error of Approximation	RMSEA < 0.05	0.015	Accept
Root Mean Squared Residual	RMR ≥ 0	0.016	Accept
Goodness-of-Fit Index	GFI > 0. 9	0.981	Accept
Adjusted Goodness-of-Fit Index	AGFI > 0.85	0.962	Accept
Normal Fit Index or Bentler-Bonett Index	NFI > 0.90	0.970	Accept
Comparative Fit Index	CFI > 0. 90	0.998	Accept
Incremental Fit Index	IFI > 0. 90	0.998	Accept

Figure 2 displays the schematic representation of the accepted model as well as standardized path correlations among main variables and sub-scales. The non-significant paths were deleted from the final accepted model. It is clearly indicated that language learning strategy use, personality traits, and mindfulness of our participants were associated with each other. As it is detectable from this figure, all of the links among these variables were of direct, positive and reciprocal type with the strongest association between learners' language learning strategy and their personality traits (0.28). The next strong link was found between participants' personality traits and their mindfulness status (0.24) and the last one was between learners' language learning strategy and their mindfulness status (0.11). In addition to the relations found among the main variables of the study, various sub-scales of one particular variable as well as various sub-scales of different variables demonstrated to be associated with each other in either positive or negative directions. In case of big five personality traits, openness exhibited relations to extraversion and agreeableness. Furthermore, neuroticism was related to conscientiousness. Attention and awareness, as two sub-scales of mindfulness weren't linked to each other. Four intra-group associations were found among various sub-scales of language learning strategy; relations between memory and cognitive strategies; relations between cognitive and compensation strategies; relations between compensation and affective strategies; and negative relations between social and memory strategies.

With regard to inter-group associations among various sub-scales of different variables six reciprocal relations were detected. Social language learning strategy was positively linked to awareness mindfulness status and negatively linked to neuroticism personality trait. Neuroticism was also

negatively related to affective language learning strategy. Meta-cognitive strategy was found to be associated with openness in a positive direction. Compensation strategy was positively related to awareness mindfulness, whereas, memory strategy was negatively linked to attention mindfulness status. Among these inter-group relations the link between awareness mindfulness status and social as well as compensation language learning strategies demonstrated the strongest associations (0.27).

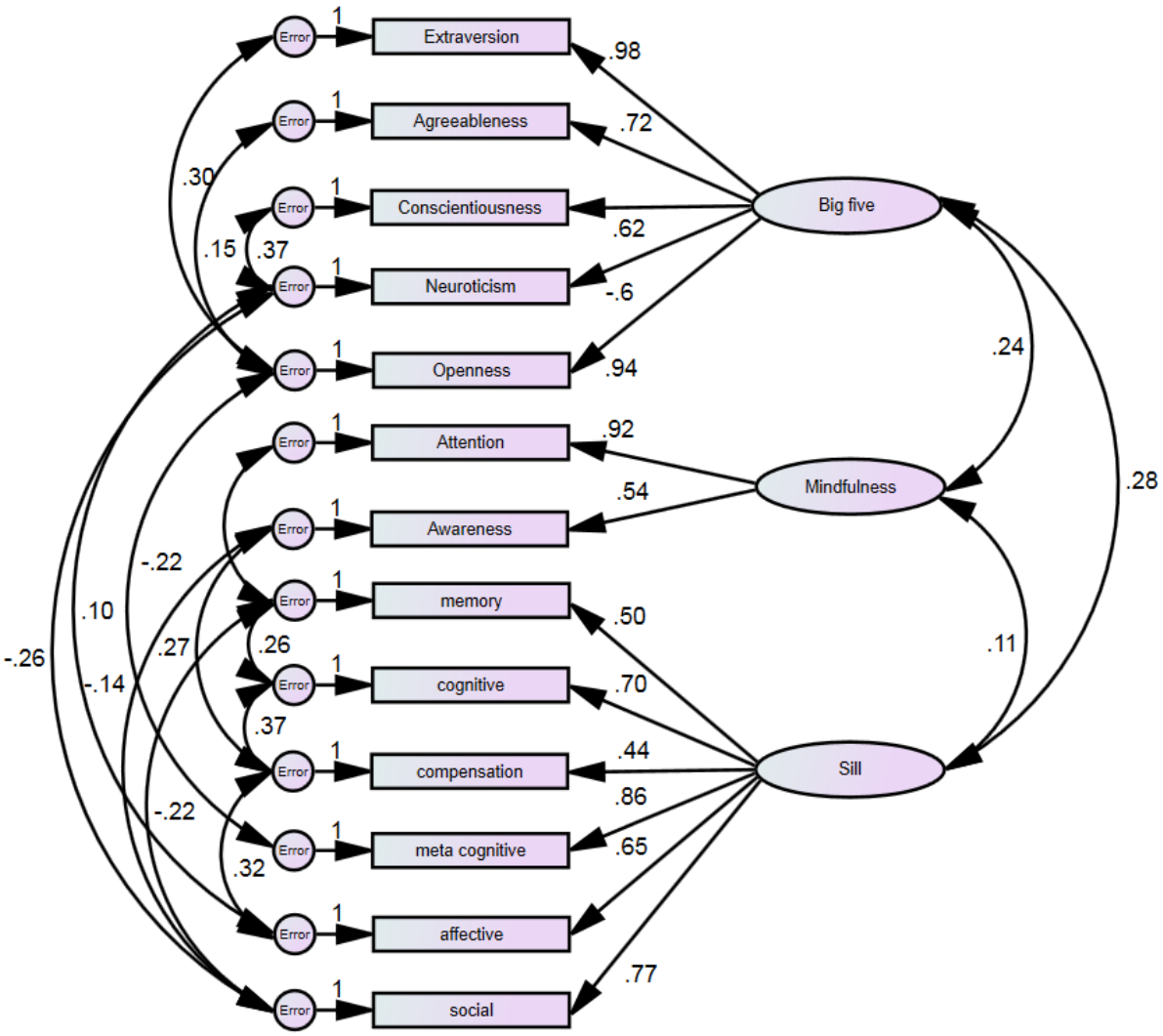

Fig. 2. Structural model of relations among language learning strategies, big five personality traits and mindfulness and their sub-scales.

Multiple regression findings also confirmed the relationships obtained by SEM. To see how main variables of study load each other and how predictions are made, a multiple regression were run. Table 5 shows the findings.

Table 5. Multiple regressions with personality traits and mindfulness as independent variables and language learning strategies as dependent variable

Language Learning Strategies			
	β	t	sig
(Constant)	1.581	5.714	.000
Personality traits	.269	5.461	.000
mindfulness	.108	2.198	.029
19.018 =F			0.000 = sig
0.780 =R			0.609 = R^2

Multiple regression analysis indicated that learners' personality traits (B=.269, t=5.461, sig=.000) predict their language learning strategies more powerfully than mindfulness status (B=.108, t=2.198, sig=.029). As is indicated by their β and t values, these two measures were positive predictors of language learning strategies.

4. Discussion

This study aimed to probe into the network of associations among learners' language learning strategies, their personality traits and mindfulness status. Although the associations between each two main variables were touched on by previous research, the network of links among these three learner variables and their respective sub-scales were rarely the subject of relevant studies. The main results of this study, obtained through SEM analysis, confirmed the proposed model of the relationships among the study variables, since all of our three main variables proved to be related to each other. The main findings of this paper were in line with previous studies which demonstrated the relationships between language learning strategies and personality traits (Barrick & Mount, 1996, Sharp, 2008; Kang, 2012), language learning strategies and mindfulness (Yeganeh &Kolb, 2009, Hillgaar, 2011), and personality traits and mindfulness (Hurk et al., 2011, Latzman & Matsuda, 2013).

In order to investigate the links among various sub-scales of the main variables, first spearman correlations were calculated which revealed multiple associations among different sub-scales (Table 1). In case of the links between learning strategies and personality traits, conscientiousness and openness demonstrated the most positive links to four of the six learning strategies. These findings served as verification to Blickle's (1996) claim with regard to relations between openness and the desire to use wider learning strategies. Kang (2012) also found positive relationships between conscientiousness and openness traits and most of language learning strategies. The positive link between successful language learning and the conscientiousness trait was also supported by other studies (Reiss, 1983; Barchard, 2003; Noftle& Robins, 2007)**.** As it was evinced by correlation matrix (Table1), neuroticism trait indicated negative significant relations to half of the language learning strategies. This finding also indicated consistency with previous research (Kang, 2012) in this regard. McCrae and Costa (2004) also proposed that neuroticism is connected with negativism and anxiety. Furthermore, Dörnyei (2005) referred to anxiety involved in neuroticism as producing negative learning outcomes.

Another set of links that can be detected from Table 1 are the correlations between various language learning strategies and different mindfulness sub-scales. Attention and awareness were positively associated to cognitive and compensation strategies, meanwhile, negatively linked to memory and social strategies. The positive associations between mindfulness and learning strategies were

confirmed by previous research. According to Oxford (2003), learners consciously choose strategies that fit their learning style. Thus, we expect consciousness to be closely related to learning strategies. Schmidt (1994) introduced four dimensions of consciousness; intention (deliberateness of the learner in attention to a stimulus), attention (detection of a stimulus), awareness (the learner's knowledge or subjective experience that he/she is detecting a stimulus), control (the extent to which the language learner's output is controlled). Accordingly, the positive significant association found between compensation strategies and attention and awareness mindfulness seems to be logical, meanwhile, the negative relations between attention and awareness sub-scales and memory and social language learning strategies are not consistent with previous psycholinguistic research (Hatch, 1983; Gass, 1988, 1997; Pienemann, 1989; Pienemann & Johnston, 1987; Robinson, 1995; Swain, 1995; Ellis, 1996; Skehan, 1998) that emphasized the role of attention as a necessary element for storage and hypothesis formation and testing which are priori factors in memory strategies.

The last significant connections represented in correlation matrix (Table 1) that are discussed in this section are the links between various personality traits and mindfulness sub-scales. Openness, agreeableness, and conscientiousness personality traits showed positive associations with mindfulness status, whereas, neuroticism proved negative links to both attention and awareness mindfulness. These findings were exactly in line with previous studies in literature (Costa & McCrae, 1992; Kabat-Zinn, 1990, cited in Giluk, T. L., 2009; Brown &Ryan, 2004; Hurk et al., 2011; Latzman &Matsuda, 2013) that referred to receptivity to experience, showing feelings of empathy, and deliberateness as common properties between mindfulness and openness to experience, agreeableness, and conscientiousness, respectively.

To see if the significant relationships obtained via simple correlation processes are confirmed in the network of associations among the study variables, it was necessary to render the data to SEM analysis approach. It was revealed that all of the main variables of the study were associated with each other. Furthermore, in addition to significant relationships that were found among sub-scales of each main variable, six of the correlations discussed previously were confirmed through SEM analysis. As discussed before, negative links between memory and social strategy and mindfulness subscales were inconsistent with previous findings. One reason may be that of the nature of concepts which are measured through MAAS as the scale to evaluate mindfulness status. As Walach et al. (2006) argued, since the scale places a priori focus on attention and awareness, other aspects of mindfulness, such as the non-judgmental, accepting attitude, and insightful understanding are left out. However, in other studies, mindfulness has been regarded as a concept related to psychological inflexibility (Hayes et al., 2006, Baer et al., 2006). Thus, considering substantial properties of social language learning strategy, the negative links between mindfulness and this strategy seems to be logical. Another link that proved to be significant in SEM analysis was the positive association between compensation strategy and awareness mindfulness. Metacognitive strategy and openness personality trait also proved significant positive relations via SEM analysis. Neuroticism trait exhibited negative association with affective and social strategies. All of these relations were discussed previously in this section.

5. Conclusion

In this study, we used SEM analysis to provide a more precise estimate of the relationships among language learning strategies, personality traits and mindfulness in a network of associations. Results of the current study indicated that all of these three variables had positive reciprocal relationships with each other. Some of the sub-scales of the main variables involved in the study also proved to be associated with one another. The fact that there is a network of associations among

these three individual learner characteristics, suggests that in any language learning and teaching programs learners must be considered as whole human beings each with their own individual properties. The results of this study confirmed that teachers who are to plan language learning strategy training courses for their students should consider various personality dimensions of their learners as effective factors in selecting the most appropriate strategies used in a specific learning task. There are some limitations that should be taken into consideration. First is that of gender distribution. Almost two third of our participants were females. Thus, it was logically impossible to control for potential sex effects. Secondly, all of the measurement that were used in this study were self-report questionnaires and therefore prone to response bias. Future research in this field should be directed at a further integration of the various conceptualizations of leaners individual characteristics and to incorporate the effects of cultural differences and language on the relationships between learning strategies, personality traits and mindfulness.

References

Allport, A. (1988). What concept of consciousness? In A. J. Marcel & E. Bisiach (Eds.), *Consciousness in Contemporary Science* (pp. 159-182). London: Clarendon Press.

Anderson, J. (2005). *Mechanically inclined.* Portland, ME: Stenhouse Publishing.

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology*: *Science and Practice*, 10, 125–143.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13, 27–45.

Barchard, K. A. (2003). "Does Emotional Intelligence Assist in the Prediction of Academic Success?". *Educational and Psychological Measurement*, 63, 840-858.

Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *International Journal of Selection and Assessment,* 9, 9–30.

Barrick, M., & Mount, M. (1996). Effects of impression management and self-deception on the predictive validity of personality constructs. *Journal of Applied Psychology*, 81, 261 –272.

Bidjerano, T., & Yun Dai, D. (2007). The relationship between the big-five model of personality and self-regulated learning strategies. *Learning and Individual Differences*, 17,69 – 81.

Birdsong, D., ed. (1999). *Second Language Acquisition and the Critical Period Hypothesis*. Mahwah, NJ: Lawrence Erlbaum.

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: A proposed operational definition. Clinical Psychology: *Science and Practice*, 11, 230–241.

Blickle, G. (1996). Personality traits, learning strategies, and performance. European Journal of Personality , 10, 337 – 352.

Bollen, K. A. (1989). Structural equations with latent variables. New York: Wiley.

Bollen, K. A., & Long, J. S. (1993). Testing structural equation models. Newbury Park ,CA: Sage.

Bongaerts, T. 1999: Ultimate attainment in L2 pronunciation: the case of very advanced late L2 learners. In D. Birdsong (Eds.), *Second Language Acquisition and the Critical Period Hypothesis* .Mahwah, NJ: Lawrence Erlbaum Associates, 133 59.

Bowlin S. L. & Baer R. A., (2012). Relationships between mindfulness, self-control, and psychological functioning. *Personality and Individual Differences*, 52, 411–415.

Brown, H. D. (2000). Principles of language learning and teaching. Englewood Cliffs, NJ : Prentice Hall.

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*,84, 822–848.

Brown, K. W., & Ryan, R. M. (2004). Perils and promise in defining and measuring mindfulness: Observations from experience. *Clinical Psychology: Science and Practice*, 11 (3), 242-248.

Byrne, B. M. (20 01). *Structural equation modeling with AMOS. Basic concepts, applications, and programming* . Mahwah, N.J.: Lawrence Erlbaum Ass.

Carson, J. G. & Longhini A. (2002). Focusing on learning styles and strategies: A dairy study in an immersion setting. *Language Learning*. 52(2), 401-438.

Chamorro-Premuzic, T., & Furnham, A. (2008). Personality, intelligence and approaches to learning as predictors of academic performance. *Personality and Individual Differences*, 44, 1596 – 1603.

Chang, S.J. 1990. A study of language learning behaviors of Chinese students at the University of Georgia and the relation of these behaviors to oral proficiency and other factors. Doctoral dissertation, University of Georgia, Athens, GA.

Chen, I.J. 2002. Language learning strategies used by high and low English proficiency students in a technology college. Master's thesis, Changhua Normal University,Changhua, Taiwan.

Clark, M. H., & Schroth, C. A. (2010). Examining relationships between academic motivation and personality among college students. *Learning and Individual Differences*,19, 20– 24.

Cohen AD (1998) *Strategies in learning and using a second language*. Essex, U.K.: Longman.

Cook, V. (2008). *Second language learning and language teaching* (4th ed.). London: Edward Arnold.

Costa, P. T., & McCrae, R. R. (1992).*NEO-PI-R. Profession al manual*. Odessa, FL: Psychological Assessment Resources.

DeKeyser, R. M. (2000). The Robustness of Critical Period Effects in Second Language Acquisition. *Studies in Second Language Acquisition*, 22, 499-533.

Dewaele, J.-M., and Furnham, A. (1999). "Extraversion: The unloved variable in applied linguistic research". *Language Learning* 49: 509-544.

Diseth, A. (2003). Personality and approaches to learning as predictors of academic achievement. *European Journal of Personality*, 17, 143 – 155.

Dörnyei , Z. (2005). The psychology of the language learner: Individual differences in second language acquisition. Mahwah, N.J.: L. Erlbaum .

Dörnyei , Z. (2009). Individual differences: Interplay of learner characteristics and learning environment. Language Learning, 59, 230-248.

Ehrman, M. & Oxford R. (1990). Adult language learning styles and strategies in an intensive training setting. *Modern Language Journal*, 74, pp. 311–326.

Ehrman, M. & Oxford, R. (1989). Effect of sex differences, career choice, and psychological type on adult language learning strategies. *Modern Language Journal*. 73(1), 1-13.

Ehrman, M. E., Leaver, B.L. & Oxford R. (2003). A brief overview of individual differences in Second language learning. *System*. 31, 313-330.

Ellis, R. (1985). *Understanding second language acquisition*. Oxford: Oxford University Press .

Ellis, R. (1994). *The study of second language acquisition*. Oxford: Oxford University Press.

Ellis, R. (1994). *The study of second language acquisition*. Oxford: Oxford University Press.

Ellis, R. (2004). Individual differences in second language learning. In A. Davies & C. Elder (Eds.), *The handbook of applied linguistics* (pp. 525-547). Malden ,Mass.: Blackwell.

Ely, C. M. (1986). An analysis of discomfort, risk taking, sociability, and motivation in the L2 classroom. *Language Learning*, 36(1), 1-25.

Ely, C., Pease-Alvarez, L., 1996. Learning styles and strategies in ESOL: introduction to the special issue. *TESOL Journal* 6 (1), 5.

Engin, A. O. (2006). The indirect speech method approach and the variables which affect learning success in developing foreign language speaking abilities. *Ekev Academy Journal*, 28, Erzurum ,Turkey.

Feltman, R., Robinson D. M., & Ode, S. (2009). Mindfulness as a moderator of neuroticism–outcome relations:A self-regulation perspective. *Journal of Research in Personality*, 43, 953–961.

Furnham, A., & Monsen, J. (2009). Personality traits and intelligence predict academic school grades. *Learning and Individual Differences*, 19, 28 –33.

Gass, S. (1988). Integrating research areas: A framework for second language studies. *Applied Linguistics*, 9, 198-217.

Gass, S. (1997). *Input, interaction, and the second language learner* . Mahway, N.J:Erlbaum.

Gass, S., & Selinker, L. (1994). *Second language acquisition: An introductory course* . Hillsdale, NJ: Lawrence Erlbaum.

Germer, C. K., Siegel, R. D., & Fulton, P. R. (Eds.). (2005). *Mindfulness and psychotherapy*. New York :Guilford Press.

Giluk, T. L. (2009). Mindfulness, Big Five personality, and affect: A meta-analysis. *Personality and Individual Differences,*47, 805–811.

Green, J. M., & Oxford, R. L. (1995). A closer look at learning strategies, L2 proficiency, and gender. TESOL Quarterly, 29(2), 261-297.

Hamilton, R. P. (2001). The significance of learners' errors: Philosophical investigation of the interlanguage hypothesis. *Language and Communication,* 21, 73-88.

Hatch, E. (1983). *Psycholinguistics: A second language perspective*. Rowley, MA**:**Newbury House.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, 44, 1–25.

Hillgaar, S. D. (2011). Mindfulness and self-regulated learning. Masters' Thesis. The University of Science and Technology, Trondheim.

Horwitz, E. K. (1990). *Attending to the affective domain in the foreign language classroom: Shifting the instructional focus to the learner.* Middlebury, VT: Northeast Conference of foreign language teachers.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55

Hyland, T.(2008)."Mindfulness and lifelong learning." .*Education: Journal Articles*.

John, O. P., & Srivastava, S. (1999).The big five taxonomy: History, measurement and theoretical perspectives. In L.A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research*. New York: Guilford.

John, O. P. (1990). The big five factor taxonomy: dimensions of personality in the nature language and in the questionnaire. In L.A. Pervin (Eds.), *Handbook of personality: Theory and research* pp.66-100. New York: Guilford Press.

Johnson, J. S. & Newport, E. L. (1989). Critical period effects in second language learning: the influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, 21, 60-99.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10, 2, 144-156.

Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life.* New York: Hyperion.

Kang, S. Y. (2012). Individual differences in language acquisition: Personality traits and language learning strategies of Korean university students studying English as a foreign language. Doctoral dissertation, Indiana State University, Terre Haute.

Kostanski, M. (2007). *The role of mindfulness in reducing stress for pre-service students.* Paper presented at the annual conference of the Australian Association for Research in Education, Fremantle.

Langer, E. (1997). *The power of mindful learning.* Reading, MA: Addison- Wesley.

Langer, E. J., & Moldoveanu, M. (2000). The Construct of Mindfulness. *Journal of Social Issues*, 56 1, 1-9.

Latzman, R.D., & Masuda A.(2013). Examining mindfulness and psychological inflexibility within the framework of Big Five personality. *Personality and Individual Differences*(in press).

Locastro, V. (2001). Individual differences in second language acquisition: Attitudes, learner subjectivity and second language. System, 29, 1, 69-89.

McCare, R.R., & John, O. P. (1992). An introduction to the Five-Factor Model and its application. *Journal of Personality*, 60, 2, 175-215.

McCrae, R. R., & Costa, P. T., Jr. (2004). A contemplated revision of the NEO Five-Factor Inventory. *Personality and Individual Differences*, 36, 587–596.

Nguyen, N. T., Allen, L. C., & Fraccastoro, K. (2005). Personality predicts academic performance: Exploring the moderating role of gender. Journal of Higher Education Pol-icy and Management, 27, 105 – 116.

Noftle, E. E., & Robins, R. W. (2007). Personality predictors of academic outcomes: Big Five correlates of GPA and SAT scores. Journal of Personality and Social Psychology, 93, 116 – 130.

Nunan, D. (1999). *Second language teaching and learning*. Boston :Heinle and Heinle Publishers.

O'Connor, M. C., & Paunonen, S. V. (2007). Big Five personality predictors of post-secondary academic performance. *Personality and Individual Differences* , 43,971 – 990.

Oxford RL (1990). *Language Learning Strategies: What Every Teacher Should Know*. New York: Newbury House Publishers.

Oxford, R. L. (2003). Language learning styles and strategies: An overview. Learning Styles & Strategies. *GALA*, 1-25.

Oxford, R. L., & Nyikos, M. (1989). Variables affecting choice of language learning strategies by university students. *Modern Language Journal*, 73, 3, 291-300.

Oxford, R. L. & Ehrman, M. (1995). Adult's language learning strategies in an intensive foreign language program in the United States. *System,* 23, 3, 359 -386.

Oxford, R. L. (1996). Employing a questionnaire to assess the use of language learning strategies. *Applied Language Learning*. 7, 1& 2, 25-45.

Oxford, R. L., & Nyikos, M. (1989). Variables affecting choice of language learning strategies by university students. *Modern Language Journal*, 73, 3, 291-300.

Oxford, R. L., & Burry - Stock, J. (1995). Assessing the use of language learning strategies worldwide with the ESL/EFL version of the Strategy Inventory for Language Learning (SILL). *System*, 23, 1, 1- 23.

Oxford, R. L., & Cohen, A. (1992). Language learning strategies: crucial issues of concept and classification. *Applied Language Learning*, 3, 1& 2, 1 -35.

Oxford, R. L. & Anderson, N. J. (1995).A cross cultural view of learning styles. *Language Teaching,* 28, 201 15.

Park, G. (1997). Language learning strategies and English proficiency in Korean university students. *Foreign Language Annals,* 30,211-221.

Pienemann, M. & Johnston, M. (1987). Factors influencing the development of language proficiency. In D. Nunan (Eds.), *Applying second language acquisition research*.

Pienemann, M. (1989). Is language teachable? *Applied Linguistics*, 10, 52-79.

Reid, J. M. (1987). The learning style preferences of ESL students .*TESOL Quarterly*, 21, 1, 87-111.

Reid, J. M. (1995). *Learning Styles in the ESL/EFL Classroom*. Boston, MA: Heinle and Heinle.

Reiss, M.A. (1983). Helping the unsuccessful language learner. *Canadian Modern Language Review, 39(2), 257-266.*

Robinson, P. (1995). Review article: Attention, memory, and the noticing hypothesis. *Language Learning*, 45, 283-331.

Rossi-Le, L. (1995). Learning style and strategies in adult immigrant ESL students. In J.M. Reid (ed.), *Learning styles in the ESL/EFL classroom*. Boston: Heinle & Heinle, pp. 118–125.

Salomon, S., & Globerson, T. (1987). Skill may not be enough: The role of mindfulness in learning and transfer. *International Journal of Educational Research*, 11, 6, 623–637

Salzberg, S., & Goldstein, J. (2001). *Insight meditation*. Boulder, CO: Sounds True.

Schmidt, R. (1994). Implicit learning and the cognitive unconscious: of artificial grammars and SLA. In N. Ellis (Eds.), *Implicit and Explicit Learning of Languages*. London: Academic Press, 165- 209.

Schmidt, R., Boraie, D., & Kassabgy, O. (1996). Foreign language motivation: Internal structure and external connections. In R. Oxford (Eds.), *Language learning motivation: Pathways to the new century* (Technical Report #11) (pp. 9-70). Honolulu: University of Hawai'i, Second Language Teaching and Curriculum Center.

Sharp A (2008) Personality and second language learning. *Asian Social Sci*. 4, 11, 17-25.

Skehan, P. (1998). *A Cognitive Approach to Language Learning*. Oxford: Oxford University.

Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research*, 25, 173 – 180.

Strong, M. (1983). Social styles and the second language acquisition of Spanish speaking kindergartners. *TEOSL-Quarterly*, 17(2), 241-258.

Swain, M. (1995): Three functions of output in second language learning. In G. Cook and B . Seidlhoffer (Eds), *Principle and Practice in Applied Linguistics: Studies in Honor of H. G. Widdowson* . Oxford: Oxford University Press, 125-44.

Swanberg, A. B., & Martinsen, L. (2010). Personality, approaches to learning and achievement. *Educational Psychology*, 30,75 – 88.

Tamada, Y. (1996). The relationship between Japanese learners' personal factors and their choices of language learning strategies. *Modern Language Journal*, 80, pp. 120–131.

Tomlin, R. S., & Villa, V. (1994). Attention in cognitive science and second language acquisition. *Studies in Second Language Acquisition, 16, 183-203.*

Tseng, W., Dornyei, Z., Schmidt, N. (2006). A new approach to assessing strategic learning: the case of self-regulation in vocabulary acquisition .*Applied Linguistics*, 27, 1, 78-102.

Van den Hurk P. A. M., Wingens, T., Giommi, F., Barendregt, H. P., Speckens, A. E. M., & Van Schie, H.T. (2011). On the Relationship Between the Practice of Mindfulness Meditation and Personality—an Exploratory Analysis of the Mediating Role of Mindfulness Skills. *Mindfulness (N Y)*, 2,3, 194–200.

Walach, H., Buchheld, N., Buttenmuller, V., Kleinknecht, N., & Schmidt, S. (2006). Measuring mindfulness—the Freiburg Mindfulness Inventory (FMI). *Personality and Individual Differences*. 40, 1543–1555.

Wong, L., L., C. & Nunan, D. (2011). The learning styles and strategies of effective language learners. *System, 39, 144-163*.

Yeganeh, B., & Kolb, D. (2009). Mindfulness and Experiential Learning. *OD PRACTITIONER*, 41, 3.