

**Learning Style Preferences and their Relationship to
Second Language Acquisition in Students
of English as a Second Language**

By

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Abstract

Understanding learning styles can be an essential tool to implement new learning procedures. A learning style is not just an ability but rather a preferred way of using one's abilities (Sternberg, 1994). Sanz (2005) stated that the type of input is the key to understanding why some learners learn faster than others. Therefore, the interaction of an individual difference with an external variable, together with an examination of learners' internal processes, could shed a more complete diagnosis of the SLA process. During the 1950s and 1960s the concept of learning strategies has gained recognition because of the use of these strategies as a distinguishing feature of successful language learners (Rubin, 1975). According to Anderson (2005), second language learning strategies are 'the conscious actions that learners take to improve their language learning' (p. 757). Hence, appropriate learning strategies are highly related to successful language achievement. If learners know how to use learning strategies appropriately, they can benefit greatly. In addition, one important aspect of the connection between styles and strategies is that strategies do not function independently of styles (Cohen, 1998), so that the connection between students' styles and consequential strategy preferences must be taken into account when planning strategies training (Bull & Ma, 2001). This study examined learning styles, learning strategies, and second language acquisition. This is an area which needed investigation - to identify the nature of perceptual learning style preferences as well as students' strategies selection, in order to better understand the relationship that exists between second language students' learning styles and preferred learning strategies based on

gender, age and cultural background. The VARK Questionnaire Scoring Chart and the Strategy Inventory for Language Learning (SILL) were used to identify how students learn and process information in their own special styles and strategies. The findings of this study indicated that there is a relationship between visual learning styles domains and student's age group. Similarly, findings indicated that there is a relationship between students' age group and their preferences for aural domains. Findings also indicated that there was a significant difference of strategy use among students from Asia, Middle East, Africa, Europe and America, and there was no significant difference of other specific learning strategies in relation to background, although the results in regard to cognitive strategy are very close to a statistical significance. The findings indicated that there was a positive correlation between aural learning style and metacognitive strategy's use, as well as aural learning style and affective strategy's use. Implications of this study show us that findings may help to better understand both perceptual learning style preferences and learning strategies of ESL students while in a second language acquisition environment.

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Chapter 1

Introduction

Understanding learning styles can become an essential tool to implement new learning procedures. Knowledge of individual learning style preferences will help students see themselves as learners and the awareness of their learning style preferences can lead to improving performance and learning outcomes (Claxton & Murrell, 1987).

A learning style is not just an ability but rather a preferred way of using one's abilities (Sternberg, 1994). Individuals have different learning styles, that is, they differ in their natural, habitual, and preferred way(s) of absorbing, processing, and retaining new information and skills (Reid, 1995).

Although we can hypothesize that formal instruction is facilitated when there is a match between the instructional style and the learner's learning style, in general we do not know exactly what instructional and educational factors should be taken into account to ensure an optimal matching (Reid, 1995). In response to empirical findings which indicate that formal instruction makes a positive difference in language learning, several studies have emerged which are trying to establish the general characteristics of effective instruction and to identify potential instructional variables which may influence the success of the learning (Doughty, 1991; Drew & Ottewill, 2002; Fotos & Ellis, 1991; Schmidt, 1990; Slaats, Lodewijks, & Van Der Sanden, 1999; Tomasello & Herron, 1988). Since each person learns differently, the same instructional

environment, methods and resources will be more effective for some learners and less effective for others (Burke & Dunn, 2003).

Learning styles can be defined as the way in which individuals process information and analyze it (Jahiel, 2008). Some individuals seem to have a primary learning style and others have more than one. Individuals observe, process, and analyze information by using one or more learning styles. When considering the process of acquiring a second language, for instance, Gregory (2005) asserted that teachers modify their teaching methods in order to match students' learning styles. If teachers modify their teaching methods, they can create a classroom environment suitable for all types of students' learning preference, and they will present materials that appeal to the visual, aural, and kinesthetic learning styles of students (Gregory, 2005).

It is generally assumed in the field of second language acquisition (SLA) that different types of instruction may lead to different outcomes in learning (Norris & Ortega, 2000; Spada & Tomita, 2010), with some learners benefiting more from a specific instructional type than others. While one learner may find a wholly detailed explanation of a grammar rule useful, another may prefer an approach where, given the hint, he has to find out for himself how a certain grammar structure works (Norris & Ortega, 2000; Spada & Tomita, 2010). Recent studies about learning styles indicate a continued interest in this subject and its influence on students' learning processes (Cook & Smith, 2006; Durham-Thompson, 2005; Evans, Cools, & Charlesworth, 2010). The application of learning style theories can assist educators to design more effective instruction and place students in learning situations that are appropriate for them (Keefe, 1979). Learning styles theories, when applied to the classroom, raise awareness in both teacher and

learner that each one has different ways of learning and those differences should be addressed for teaching to be effective and learning to take place (Claxton & Murrell, 1987; Pritchard, 2005).

Although individuals may have some strong style preferences and tendencies, learning styles are not fixed modes of behavior, and, based on different situations and tasks, styles can be extended and modified (Oxford, 2011; Reid, 1987). However, the extent to which individuals can extend or shift their styles to suit a particular situation varies (Ehrman, 1996).

Many SLA studies have focused on other individual differences such as aptitude, age, or gender, but the actual learners' preferences have been largely ignored in the field. In his statement about the analysis of individual differences and internal processing mechanisms, and their interaction with external variables, Sanz (2005) stated that the type of input is the key to understand why some learners learn faster than others. Therefore, the interaction of an individual difference with an external variable, together with an examination of learners' internal processes, could shed a more complete diagnosis of the SLA process.

While there is ample evidence that individuals differ in how they prefer to process and acquire new information, the educational implications of such preferences have been a source of great controversy among researchers and educators over the years (Pashler, McDaniel, Rohrer and Bjork, 2009). In the area of SLA, a number of research studies have addressed the relationship between learning styles and second language (L2) achievement; however, these studies have generally found only a weak relationship (Ellis, 2008). Thus, according to what has been revealed so far, to define whether or not learning styles are strongly associated with SLA is an urgent issue and further research with more appropriate methodologies is needed to validate the use of learning styles assessment in these instructions (Pashler *et al*, 2009).

Statement of the Problem

Research suggests that individual learning styles play a fundamental role in learning (Entwhistle & Tait, 1995; Felder & Spurlin, 2005; Oxford, 1996, 2001). Consequently, second language acquisition is an area where research into and knowledge of individual learning styles can help find ways to reach all of the students in the multicultural classroom. Dornyei (2005) suggested that knowing which instructional methods better match the participants' approach to learning could promote overall learning effectiveness. While some empirical studies have tested these models (Ellis, 1989; Peacock, 2001; Shen, 2010; Tight, 2010) yielding contradicting findings, it still remains to be seen how learning styles correlate with different instructional types and whether it renders a different performance at testing.

Findings from these studies are rather inconclusive, as the methodologies used to provide the types of instruction were different in design. For example, some of the studies' treatments just differed on the type of instruction provided prior to practice (Herron & Tomasello, 1992; Rosa & O'Neill, 1999; Shaffer, 1989), while others included more or less explicit feedback as part of the design in addition to the types of instruction (Erlam, 2003; Rosa & Leow, 2004; Sanz & Morgan-Short, 2004; Stafford *et al.*, 2012). It was revealed that many students who came to the United States to study in American colleges have faced difficulty in finding institutions of higher education concerned about improvement of academic achievement. Learners' motivation is considered the second significant factor that affects the success of second language / foreign language (SL/FL) learning (Crookes & Schmidt, 1991; Gardner, 1985), so keeping learners motivated is a key factor for persistent student effort in learning (Dornyei & Otto, 1998).

Understanding that culture and previous schooling in a non-English language environment can impact student learning may help teachers to better understand their student's

learning styles (Oxford, 1996). Different goals, needs, and learning environments will alter learners' motivation (Ehrman, Leaver, & Oxford, 2003; Oxford & Shearin, 1994). Therefore, there is a need to increase the diversity of actions to increase students' motivation. Doing that will make it possible to identify their strengths, domains and potentialities, as well as to identify their learning styles and a better use for the acquisition of a second language.

Purpose of the Study

The purpose of this study was to examine the relationship between learning styles and second language acquisition. This is clearly an area which needs investigation, and questions concerning the evolution, modification, and/or expansion of learning styles, and the relationship of such changes to cultural adjustment, must be answered (Reid, 1987). A secondary purpose of this study was to identify the nature of perceptual learning style preferences as well as students' strategies selection, in order to better understand the relationship that exists between second language students' learning styles and preferred learning strategies based on gender, age and cultural background. The VARK Questionnaire Scoring Chart and the Strategy Inventory for Language Learning (SILL) were used to identify how students learn and process information in their own special styles and strategies.

Significance of the Study

The results from this study will help instructors to have a deeper understanding of the variables that affect second language acquisition involving foreign students in the classroom. In the same way, it will contribute to instructors in having a better understanding of foreign language students' learning styles. Claxton and Murrell (1987) stated that information on learning styles can help educators "become more sensitive to the differences students bring to the

classroom. It also can serve as a guide to the design of learning experiences that either match, or mismatch, students' style” (p. 77).

Students come to the foreign language classroom with different interests and perspectives. Since there are different ways in which teachers can respond to their needs, they must identify appropriate teaching methods that match the foreign language students' learning styles and help them in their academic engagement. Felder and Spurlin (2005) recognized the value of identifying and making students aware of their learning styles: “Doing so can provide them with valuable clues about their possible strengths and weaknesses and indications of things they might work on to improve their academic performance” (p. 105).

This study provides insights to identify students' learning profiles as well as to relate cognitive styles that may influence the success of second language acquisition. Besides that, it will indicate examples in which gains in academic performance are related to productive use of learning styles. This knowledge could serve as the basis for facilitating the planning of second language students' learning experiences.

Research Questions

This study addressed the following research questions:

1. What are the preferred learning styles of second language students in an English acquisition environment, based on gender, age and cultural background?
2. What are the preferred learning strategies of second language students in an English acquisition environment, based on gender, age and cultural background?
3. What is the relationship between second language students' learning styles and preferred learning strategies?

Limitations

There is no general agreement in terms of the definition of learning styles and how to measure them. So, the results of this study may not be representative of students in other areas such as undergraduate programs, or programs beyond the scope of this study.

Another limitation was related to students' background. This study was accomplished in an ESL setting, involving students attending an intensive ESL program. They were not fairly homogenous in terms of cultural background, since they come from different nationalities. Thus, the results of the present study may not be generalizable to a different population.

Research involving a group of native English speakers studying Spanish or Portuguese language, for example, could present similar results to this study; however, depending on the explored perspectives, they could also present different conclusions.

Definition of Terms

Auditory Learner: that one who learns from hearing words spoken and from oral explanations (Reid, 1995);

Educational background: the amount of time the subjects spent in school and whether or not they attended college and/or job training programs;

EFL: English as a foreign language. English taught to students whose first language is not English in international schools in countries where English is not the native language;

ESL: English as a second language. English taught in schools to international students whose first language is not English in countries where English is the native language;

Extrinsic motivation: means the pleasure for learning a second/foreign language because of external rewards, such as parents' praise, friends' admiration, and good grade from schoolwork (Deci & Ryan, 1985, 2000);

Intrinsic motivation: refers to the drive to learn a second/foreign language because of the pleasure from learning language itself (Deci & Ryan, 1985, 2000);

Kinesthetic Learner: one who learns best by experience, by being involved physically in classroom experiences (Reid, 1995);

Language learning motivation: means the desire and effort to learn a second/foreign language (Crookes & Schmidt, 1991; Gardner, 1985);

Learning Styles: The way students attempt to receive new information, and connect it to previous knowledge and experiences. Learning style theories have a common focus on the unique differences in learning, and how individuals learn (Felder & Spurlin, 2005; Silver, Strong & Perini, 2000).

L2: Second language;

Perceptual Learning Style Preference: A learner's preferred means of using their physical senses to approach a learning task (Reid, 1995);

Sociological Learning Styles

- Group: individual learns more easily when he studies with at least one other student, and will be more successful completing work well when working with others (p. 206);
- Individual: individual learns best when he works alone (p. 206);

Second language acquisition: learning of a nonnative language after learning a native language has begun. A central characteristic defining second language acquisition is that it occurs in the context in which that language is spoken. (Gass & Selinker, 2001);

Tactile Learner: one who learns best when has the opportunity to do 'hands-on' experiences with materials (Reid, 1995);

Visual Learner: one who learns well from seeing words in books, on the chalkboard, and in workbooks (Reid, 1995).

Organization of the Chapters

In this chapter, an introduction to the study was presented and issues related to the statement of the problem, the purpose of the study, the research questions, and the significance of this study were discussed. Chapter 2 reviews the literature in which there are important considerations and studies related to the relationship between learning styles and second language acquisition, and an analysis of the influences and positions of some theorists in this theme. The selected literature includes as well a relevant discussion about the role of learning strategies as a factor of development of learners' learning acquisition of a second language. The review of the literature concludes by presenting the main findings of studies that have considered the relationship between learning styles and second language acquisition, as well as the two instruments used in the research for this study - The Visual Aural Read / Write Kinesthetic Instrument (VARK Questionnaire) and The Strategy Inventory for Language Learning (SILL).

Chapter 3 discusses the methods for the current study. It begins with a description of the participants of the study and the development of the research instrument addressed. It explains the data collection method, followed by, at the end of the chapter, a respective summary of the demographic information, as well as the procedures used for instruction, assessment, and data analysis. Chapter 4 presents the results from the current study. The Statistical Package for the Social Sciences (SPSS) was used to analyze data regarding the specific research questions, and the chapter concludes with a summary of the results. Chapter 5 discusses the main findings achieved and conducts an analysis over its natural pedagogical implications. From the presented

conclusion, some recommendations were produced, whose fundamental purpose is to contribute to future investigations which will occasionally be developed around this same theme.

Chapter 2

Literature Review

Introduction

Among studies related to the history of learning styles research, many definitions have been offered to explain learning styles and their components. In addition to these definitions, numerous tests, questionnaires, and inventories have also been developed to measure a wide range of style-related constructs (Dunn, Dunn, & Price, 1975; Gregorc, 1982; Kolb, 1985).

In the same way, evidence produced by second-language acquisition theories not only shows the regularities, such as production of error types and how grammatical properties are internalized, but also shows that individuals approach learning a L2 differently. Kinsella (1995) argues that “because a learning style involves perception, cognition, conceptualization, affect, and behavior, it is understandable that various learning style models exist” (p. 171). Of course L2 acquisition is not limited to English, and there are studies that look at other languages such as German (Ellis, 1989) and Spanish (Cohen, 2001).

The purpose of this study was to examine the relationship between learning styles and second language acquisition and identify the nature of perceptual learning style preferences in order to better understand the relationship that exists between a student’s preferred foreign language learning style and his or her strategy selection. The VARK Questionnaire Scoring

Chart and the Strategy Inventory for Language Learning (SILL) were used to identify how students learn and process information in their own special styles and strategies.

Second Language Acquisition in Higher Education

Most faculties in higher education initially adopt a teaching style that merges the ways they prefer to learn. In Cassidy (2004), we can see that educators are called to acknowledge and understand that students learn in different ways and are pressed to diversify instructional techniques used in the classroom. Normally, some faculties approach what they saw as effective for their own learning in their higher education programs. As a result, it is noticeable that many of them in higher education are unfamiliar with learning style models and their potential to inform and enhance the learning processes in the classroom.

Claxton and Murrell (1987) observed that knowledge of learning styles can help educators “become more sensitive to the differences students bring to the classroom. It can also serve as a guide to the design of learning experiences that match or mismatch students’ styles, depending on whether the purpose of the experience is instrumental or developmental” (p. 78). Kuh, Kinzie, Schuh, and Whitt (2005) claimed that “interest in creating the conditions that enhance student learning and supporting students in achieving their educational goals is at an all-time high” (p. 3).

In their review of current practices, Norris and Pfeiffer (2003) pointed out the need for college foreign language departments “to address the critical relationship between setting valuable learning standards, developing curriculum and instruction that enables students to attain these standards, and engaging in assessment that illuminates and fosters student learning” (p. 573). The implications for education in a whole are significant when faculties tend to reach only

some of the students in a given course if they assume that all students learn the same way or that one teaching approach will connect with all students.

Since the goal of second language acquisition programs is to determine and develop the language proficiency levels of students under the new foreign language, a particular pedagogical approach or curriculum design will be necessary to support the students in languages taught. The most important consideration is that the learning process has to be appropriate to the aims of program effectiveness (Upcraft & Schuh, 2002). Use of a variety of teaching and learning approaches has the potential to enhance the learning and performance for a wider range of adult students in a course and to expand the learning approaches with which adult students are comfortable and capable of learning.

More recently, Troyan (2012) argued for the necessity of developing a science of education for foreign language. In his view, developing an approach to undergraduate language education involves making a sustained commitment to a systematic, iterative process of setting goals and objectives; designing and testing innovative pedagogical approaches and assignments; assessing learning outcomes and using the findings to inform, and if warranted redesign, educational programs and practices. So, faculties who are consciously aware of their students' learning styles as well as their own are in a position to make more informed choices in course material, design, and learning processes to broaden the opportunities for effective learning in their courses.

Troyan (2012) shows the priority that has to be directed to one university's approach to internationalizing the curriculum and revision process of institutions. This also engages faculty in the exploration and use of a range of evaluation and assessment measures that can yield more

information on how students are performing. Plus, it has to be engaged not only on the proficiency objectives of the foreign language requirement, but also on the more specific goals and objectives of each individual program. Because the premise is that adult students learn in different ways, faculties in higher education would have the responsibility of expanding their repertoire of activities, in order to achieve more effective learning. Chickering and Gamson (1987) emphasized that educators should “respect students diverse talents and ways of learning” (p. 5), and definitely the application of learning styles theories can assist educators to design more effective instruction and place students in learning situations that are appropriate for them (Keefe, 1979).

Learners' Motivation and Success in Second Language Learning

Motivation is an inner state and usually is measured through two-folded aspects: the degree of desire and the degree of effort exerted to a task. Keller (1983) defines motivation as "the magnitude and direction of behavior" (p. 389); Johnson (1979) sees motivation as "tendency to expend effort to achieve goals" (p. 283); Schunk (1990) refers to motivation as "the process whereby goal-directed behavior is instigated and sustained" (p. 3). Similarly, Schmidt et al. (1996) focus on the importance of magnitude of desire; thus, motivation is explained as something that either exists or does not exist, depending on its intensity.

Motivational studies, dating to the 1950s, indicate that a motivated learner will likely perform better on their learning tasks (Gardner & Lambert, 1972) and actively participate in learning tasks (Oxford & Shearin, 1994). Research studies have determined that students demonstrate statistically higher test scores, fewer discipline problems, and improved attitudes towards learning when they are taught through a method that appeals to their own learning styles (Dunn & Griggs, 1988; Kirby, 1979).

Hansen-Strain (1989) conducted a study looking at the effects of matching language teachers and students in terms of their learning style. He collected data from 884 ESL students and 26 teachers in writing classes between 1981 and 1988. The results indicate that when second language learners were matched with their teacher, considering their main domains, they received higher grades in their writing courses.

The motivation construct has many aspects including psychological, social, and cultural factors. It involves "a goal, effortful behavior, a desire to attain the goal, and favorable attitudes toward the activity in question" (Gardner, 1985, p. 50). As economic and educational globalization takes place, students are expected to take responsibility for their own learning. New information and changing technology call for students to become lifelong learners. It is essential that individuals engage in learning in the classroom and beyond the educational systems (Aljojo, Adams, Alkhouli, Fitch, & Saifuddin, 2009; Avis, Fisher, & Thompson, 2010; Hall, 2005; Hall & Moseley, 2005; Jarvis, 2004; Kodrzycki, 2003).

Another important motivation construct is often discussed when explaining success with learning tasks (Deci & Ryan, 1985). For them, motivation is classified as intrinsic and extrinsic. The intrinsic comes from the learning task itself. So, when learning tasks are found to be interesting and learners can fulfill a sense of achievement, they become intrinsically motivated in learning (Deci & Ryan, 1985, 2000). Extrinsic motivation means the pleasure or the learning force is from external rewards. Learners complete learning tasks because of the rewards from teachers, parents, or friends. To enjoy the pleasure of rewards, learners will continue to learn. Once the reward disappears, the learning dynamic may decrease.

In addition to any other factor, motivation is influenced by the context, people involved, specific circumstances, and tasks (Pintrich & Schunk, 1996). Certainly, when we consider all

that, it is possible to observe that different types of motivation have their role in influencing learners' desire for learning a second or foreign language. Such examination is very important to educators when encouraging students to a second language in a foreign language setting. So, if the intention is that learners commit their time to learning tasks, it is essential to determine their needs in regard to a specific context and circumstance.

Teachers' Understanding of Foreign Students

For Orozco, Orozco & Todorova (2008), the human journey is punctuated by fundamental turning points – transitions that promise both risk and opportunity. With proper social supports and guidance, these transitions can lead to greater mastery, potential and self realization. When poorly managed, however, such transitions can be debilitating and derailing. When arriving in the United States, many adult immigrants from different cultural and educational backgrounds find themselves in a difficult position. The necessity of learning a second language becomes a priority in order to survive in a new society, especially in economic, social and academic contexts. During the process of acquiring the target language, some gain success while others do not. Being successful or a failure is a consequence of the complex interaction of factors related to the second language learning process, the environment, and the nature of the individual learner (Orozco, Orozco & Todorova, 2008).

Blassingame (2000) found that educators who teach in multicultural classrooms need to have respect for and embrace the diverse backgrounds of colleagues as well as students to promote a healthy learning environment. Now, researchers are looking at student learning styles to see the influences they have and how they can be influenced by culture and previous learning styles (Burke & Dunn, 2003).

The constantly changing world requires that educators make the transition from a teaching paradigm to a learning paradigm. The learning paradigm challenges educators to maximize learning in the classroom and empower students with skills necessary to become lifelong learners (Barr & Tagg, 1995; Chickering & Gamson, 1999; Fear, *et al.*, 2003; Renzulli & Dai, 2001). Souza (2003) considered the primary goal of education to be helping students develop the ability for continuous learning. He stated that “today it is necessary to learn how to learn. It is no longer acceptable to concentrate education in just one period of our lives. To exercise citizenship in any aspect, it is necessary to keep learning our whole lives” (p. 94). Instructors must become more knowledgeable about the cultural differences existing among the learners they serve. With an unpredictable learner population in most settings, perhaps instructional providers can no longer make overarching judgments about the demographics of their learners before having the opportunity to interact with them (Lea & Goodfellow, 2003).

Perceptual Learning Styles Preferences

Among various types of learning styles, three major categories are strongly relevant to the field of foreign language learning (Reid, 1995): sensory or perceptual, cognitive, and affective/temperament. A sensory or perceptual learning style concerns the physical environment in which we learn and involves the use of our senses to perceive data. Cognitive styles relate to thinking, problem-solving abilities, and the ability to organize information. Affective learning/temperament learning styles take students’ emotions, values, and feelings into consideration. Reid (1995) focused on perceptual (visual, auditory, tactile, and kinesthetic) and sociological (individual and group) learning style preferences and described these types of learners. He perceives learning styles as internally based characteristics, often not perceived or used consciously, that are the basis for the intake and understanding of new information.

James and Galbraith (1985) define the perceptual modality as “the means through which information is extracted from the environment by the senses” (p. 20). Learning styles became prevalent to serve and identify individual differences in learning. As a result, there is a large body of published research on learning styles (Akella, 2010; Biggs, 2001; Cassidy, 2004; Cassidy & Eachus, 2000). These researches have contributed to educators investigating the matter of “what are characteristic ways one approaches learning tasks” (p. 34). Sternberg and Zhang (2001) added that when educators consider the learning styles of students, they demonstrate understanding of the cultural and individual diversity present in the classroom, and at the same time improve both instruction and assessment.

Keefe (1987) argues that the perceptual modality preferences are contained within the cognitive domain of learning style, stating that “perceptual response is both cognitive and affective in the sense that preferred response is a biased initial reaction to information. “We prefer to get our information in ways that are pleasing to us” (p. 17).

Research by O’Brien (1991) into the learning style preferences of over 6,000 students claims that the visual learning style is the major preference for a majority of learners. Although we can observe that in this research there is a suggested preference for visual learning among students, in the same way we can observe there is a reported propensity for auditory teaching among instructors. Research by Hodges (1982) into the learning styles of secondary students found that approximately 90 percent of classroom instruction is presented in an auditory manner. According to him “teachers talk to their students, ask questions, and discuss facts. However, only 20 to 30 percent of any large group could remember as much as 75 percent of what was presented through discussions” (p. 30-31).

O'Brien (1989) demonstrates the same. He states that while approximately 80 percent of the instruction at the secondary level is in lecture format, only 10 percent of the students show auditory learning as their strongest learning channel. Keefe (1979) asserted that cognitive factors are "internal to the information processing system and require careful training for any adaptive change" (p. 138). The affective factors are "preferential in nature and respond to both training and matching strategies" (p. 138). The psychological factors are "rooted in learner reactions to the environment and are responsive to instructional matching" (p. 138). A well known and accepted definition of learning styles comes from the work of Keefe (1979) in which he defined learning styles as the "characteristic cognitive, affective, and psychological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (p. 4).

Dunn and Griggs (1988) support the view that learning styles are internal, stating that "learning style is a biologically and developmentally imposed set of characteristics that make the same teaching method wonderful for some and terrible for others" (p. 3). Rassool and Rawaf (2008) emphasized that understanding students' learning style preferences can enhance learning. They go on to say that this understanding is especially important for those students who are underperforming in their studies. Keefe (1979) indicated that a "student's learning style provides the road map for personalized education and for training and/or matching strategies" (p. 138). He suggests that learning styles connect different areas of learning, describing them as "a construct that links perceptual response tendencies, cognitive control skills and study and instructional preferences" (p. 30).

Individual Learner Differences

Individuals within cultures vary in ways that are as dramatic as the variations across cultures, and one can map similar personality variations across different cultures. This suggests that personality is in part a reflection of the natural variability within human nature and cuts across cultures. Individual differences in learning and how individuals learn are a common focus explored by learning styles theories. Thus, researchers use different approaches to identify the ways that individuals learn (Felder & Spurlin, 2005; Kolb, 1984; Sternberg & Grigorenko, 2001).

Dunn, Beaudry, and Klavas (1989) indicated that students with multiple learning styles tend to gain more and obtain higher scores compared to those who rely solely on one style. Likewise, Dunn, Griggs, Olson, Beasley, and Gorman (1995) noted that students who were taught by an approach compatible with their learning styles did better than those whose learning styles were not matched to teaching approaches. For Alkhatnai (2011) in regard to the desire for change, many of the learners express dissatisfaction with the traditional format of classes and indicate a desire to change to a different format. “Some of them emphasized that this new format of classroom offered them something that was different from what they had been used to” (p. 160).

Curry (1983) argues that the field of individual differences in regard to learning styles was abandoned prematurely and researchers became more interested in sociological differences. As a result of this shift in interest, the field was left “fragmented and incomplete, without clear unity or established connection with any of the central concerns of education” (p. 2). Skehan (1989) believes that this aptitude is consistently linked with the current interest of keeping under investigation areas of second language acquisition. Saville-Troike (2006) suggests the

assumption that there is a talent which is specific to language learning has been widely held for many years.

Felder (1995) said that “the way in which an individual characteristically acquires, retains, and retrieves information are collectively termed the individuals’ learning styles”. So, each individual is different from the other and these individual differences, according to Dörnyei (2005) are enduring personal characteristics that are assumed to apply to everybody and on which people differ by degree.

Knowledge of individual learning styles will assist students to see themselves as learners, and become more engaged in the learning process, and improve their effectiveness as learners. Students’ awareness of their learning style preferences can lead to improving student’s performance and learning outcomes (Claxton & Murrell, 1987; Pritchard, 2005; Rassool & Rawaf, 2007). Kolb (2005) focused on the individual process of learning. He reinforced that the “learning process is not identical for all human beings” (p. 62). Plus, he asserted that “learning is the major determinant of human development and that how individuals learn shapes the course of their personal development” (p. 4). While students understand more about their own preferences for learning, according to Claxton & Murrell (1987), they are also learning how to learn, which is “an empowering experience that students need if they are to be successful lifelong learners” (p. iv). In this concern, Bostrom and Lassen (2006) stressed that “being able to recognize and evaluates one’s learning style is a key means of reflecting on one’s own thinking processes” (p. 186).

Learning Strategies and Second Language Acquisition

During the 1950s and 1960s, researchers proposed that learning an L2 was a particular talent, or group of talents, independent of performance on general intelligence tests and called

this language learning aptitude (Carroll, 1981). Initial interest in students' use of learning strategies existed in the mid-1970s and early 1980s (Allwright, 1984).

According to Rubin (1975), the concept of learning strategies has gained notoriety because the use of these strategies is a distinguishing feature of successful language learners. Oxford (1990) defines learning strategies as “specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations” (p.8). For her, a strategy is understood as a set of actions that L2 learners perform in order to facilitate their language learning (Oxford, 1996). This is different from traditional approaches to strategies, in which strategic performances of individual L2 learners used to be considered isolated from the context in which they were situated. Definitely, even when exposed to the same teaching methods and learning environment, certain learners are more successful than others at learning a second language (Rubin, 1975).

Based on her research, Oxford (1990a) divides strategies into two major classes: direct strategies, which directly involve the target language. Plus, there are specific ways that involve use of language, sub-divided into memory, cognitive and compensation strategies; and indirect strategies, which "do not directly involve the subject matter itself, but are essential to language learning nonetheless" (Oxford 1990b, p. 71). Further they were divided into metacognitive, affective, and social strategies. All of these categories, however, attempt to identify what successful learners do so that these strategies can be taught to less successful learners. Several different studies have shown that L2 learners apply personal techniques to enhance using or learning the target language, and to achieve communicative competence (Oxford,1990; O'Malley *et al.*,1985; Rubin,1981; Macaro, 2001 and Goh, 2002).

Rivera-Mills & Plonsky (2007) state that “another variable closely related to the appropriate or inappropriate use of learning strategies is learning styles” (p. 540). For them, the connection between styles and strategies has been well researched. In addition, one important aspect of the connection between styles and strategies is that strategies do not function independently of styles (Cohen, 1998), so that the connection between students' styles and consequential strategy preferences must be taken into account when planning strategies training (Bull & Ma, 2001).

According to Anderson (2005), L2 learning strategies are ‘the conscious actions that learners take to improve their language learning’ (p. 757). Hence, appropriate learning strategies are highly related to successful language achievement. If learners know how to use learning strategies appropriately, they can benefit greatly.

Because of that, perhaps the most commonly used inventory of L2 learning strategies is the Strategy Inventory for Language Learning (SILL), which measures the self-reported frequency of certain strategies (Oxford 1996). So, since language learning outcomes and academic performance are mediated through the learners’ application of the learning strategies, some studies – and that is the case of this one - seek to explore language learning strategy use in ESL contexts.

Learning Styles Instruments and Second Language Acquisition

Since currently we observe Language Acquisition as one of the main courses in Education programs, it allows teachers the opportunity to explicitly study and learn several hypotheses and theories related to second language acquisition. Part of the students’ learning process stems from a personal habitual way of learning, and another part is influenced by the actual learning context students are confronted with (Slaats, Lodewijks, & Van Der Sanden, 1999). So, learning style falls into the categories where there are differences across individual

humans but there are groupings of humans who have common or similar learning style characteristics. In a recent study, Drew & Ottewill (2002) suggested that careful consideration be given to learning style and related factors that may contribute to successful language learning. They emphasized that more can be done to maximize student achievement, such as providing students with opportunities for exploring the learning process.

Activities related to learning styles have become a well-established part of language pedagogy; the development of literature in this area is significant and a variety of data have emerged, especially in specific topics such as cultural issues, instrumentation, gender and pedagogy linked to learning styles. Over the last two decades the area of learning styles has emerged strongly concerning perceptual learning styles. As an example there is a seminal paper published by Reid (1987) using the Perceptual Learning Styles Preference questionnaire or PLSP (Reid, 1984), after which a significant branch of research using the instrument followed (Bailey et al., 2000; Dirksen, 1988; Hyland, 1993; Isemonger and Sheppard, 2003; Peacock, 2001; Rossi-Le, 1995; Stebbins, 1995; Sy, 1991). He designed the PLSP Questionnaire to describe various perceptual learning style preferences, and identify ESL/EFL learners' perceptual-style-preferences. Reid (1987) examined four perceptual (auditory, visual, tactile learner, and kinesthetic) and two social (group and individual) learning style preferences, highlighting that each category provided information as to how individuals prefer to learn.

Increase learning styles knowledge activities has been recognized in recent years as an important strategy for dealing with unknown words, especially for involving the use of a variety of linguistic and nonlinguistic tools to help the learner when the learner does not know all the tools (Ehrman, 1995). That is, learning styles can generally be thought of as a broader concept that includes cognitive as well as affective and physiological style.

Students have different perceptual learning styles for processing information (Kinsella, 1995), so the individual learning style plays an important role in second language and foreign language learning (Carrell and Prince, 1996; Ehrman, 1995; Gardner et al., 1997). Furthermore, research by Nassaji (2004, 2006) indicated a significant link between learners' depth of vocabulary knowledge and the use of lexical inference strategy. This finding supports the idea, for instance, that lexical inference depends heavily on the richness of the learners' semantic and conceptual system (Fukkink et al., 2001).

Over the past twenty years, the proposition that students learn and study in different ways has emerged as a prominent pedagogical issue, and numerous learning styles researchers have offered descriptive typologies that range from relatively fixed student natural dispositions to modifiable preferences for learning and studying. As examples, three of these well-known and widely available learning style instruments were introduced by David Kolb, Richard Felder & Linda Silverman, and Rita & Kenneth Dunn. Each one of them has the specific purpose of identifying the qualities of student learners and helping them in exploring their potential.

Kolb Experiential Learning Theory

Kolb Experiential Learning Theory (Kolb, 1984) is a experiential model which defines learning as “the process whereby knowledge is created through the transformation of experience” (p. 26). Learning is a holistic set of processes that are continuous, with a lesser emphasis on outcomes. Learning style is the “generalized differences in learning orientation based on the degree to which people emphasize the four modes of the learning process” (p. 76). The Kolb Learning Style Inventory (LSI) is a commercially available questionnaire with twelve items where respondents rank-order four sentence endings that correspond to the four learning modes

(Hawk & Shah, 2007). Kolb (1984) suggests numerous classroom approaches that faculty can use to accommodate the diverse learning modes of their students indicated by the Kolb LSI.

Felder–Silverman Learning/Teaching Style Model

The Felder–Silverman Learning/Teaching Style Model (1988), originating in the engineering sciences, defines learning style as “the characteristic strengths and preferences in the ways individuals take in and process information” (p.674). It asserts that individuals have preferences along five bipolar continua: the Active-Reflective, the Sensing-Intuitive, the Verbal-Visual, the Sequential-Global, and the Intuitive-Deductive; The Index of Learning Styles (ILS) provides metrics for all but the Intuitive-Deductive dimension, with scores showing the strength of an individual’s preference for the indicated continuum (Hawk & Shah, 2007). Individual students have relative preferences along each of the four but can learn to function in the other direction. Felder and Silverman (1988) discuss a number of teaching approaches useful to match the learning preferences that emerge from the use of the ILS.

Dunn and Dunn Learning Style Model

In the Dunn and Dunn Learning Style Model, preferences are measured by the Productivity Environmental Preference Survey or PEPS (Dunn & Dunn, 1975, 1989). Dunn (1990) defines learning style as “the way in which individuals begin to concentrate on, process, internalize, and retain new and difficult information” (p. 353). Dunn and Dunn suggest that there are learning style stimuli and several elements within each stimulus - Environmental (sound, light, temperature, and room design), Emotional (motivation, persistence, responsibility, and structure), Sociological (learning alone, in a pair, with peers, with a teacher, and mixed) (Hawk & Shah, 2007). It is a commercially available questionnaire that offers a set of 100 questions

covering all five stimuli and their respective elements. Dunn & Dunn (1989) also present research that shows enhanced student performance in courses when faculty match learning activities to student learning style preferences as determined by the PEPS questionnaire.

Theorists of Learning Styles and Second Language Acquisition

Rod Ellis

In *Second Language Acquisition*, Ellis (1997) succeeds in creating basic overview of issues in SLA research. The overall goal of his discussion is to simplify the understanding of complex ideas associated with language. Ellis emphasizes that learners possess communication strategies that can help them make effective use of their L2 knowledge.

Ellis (1997) further describes the behaviorist learning theory and the mentalist theory of language learning as a link to the concept of Interlanguage and Individual differences in L2 acquisition, and defends a kind of over-simplification of the complex field of SLA research. His theory in second language acquisition emphasizes that, due to the complex nature of language acquisition, it is impossible to develop a single theory that adequately addresses all that is contained within SLA research. Therefore, there is still a need for multiple perspectives in second language acquisition.

Ellis (1989) takes O'Keefe's (1979) definition for learning style relating to cognitive, affective, and physiological behaviors as the basis for his study on two adult learners of German. He noted that the differences in student results were related to the fact that the teaching approach and environmental factors did not suit the learning style of one of the participants. This resulted in less than favorable results in the final achievement of that student.

Joy Reid

Reid (1987) has taken a first step in providing a global view of the learning style preferences of diverse linguistic groups. However, as she explains, future investigations that replicate and expand upon her research are needed. The relationship of education to perceptual learning style dominance is sketchy in Reid's earlier studies, in which she reports that graduate students had a greater preference for visual learning than undergraduates (Reid, 1987).

In her approach, Dr. Reid explores the educational background and academic experiences of the students in their native countries. According to her, based on these experiences combined with the learning environment and educational level of the students in the United States, influences on perceptual preferences could be inferred. The perceptual learning styles which arise from this modality, and which have been the focus of research, are visual, auditory, kinesthetic, and tactile (Reid, 1987; Stebbins, 1995).

The fact that cultural background often influences a student's preferred learning style was one finding of Reid's study. In her studies she found, for instance, that Korean students were significantly more visually-oriented than Japanese and American students; plus, those students from Arabic and Chinese language groups were also strong visual learners. According to her, Japanese students were the least auditory of all the groups, and were significantly less auditory than Arabic and Chinese speakers. For Reid, most of the groups chose kinesthetic learning as a major learning style preference, and every language background, including English, selected group work as a negative or minor preference. However, despite the low preference rating given to group learning, none of the language groups chose individual learning as a major learning style preference either. Another interesting finding from her study was that Arabic, Chinese and

Korean students exhibited multiple learning style preferences while Japanese learners did not select any major learning style preferences.

Reid (1987) touches on one important issue in her considerations of the English proficiency levels and the length of time that students had spent in the United States. For her, those students who were more proficient showed learning style preferences more closely related to native speakers of English as did those students who had lived in the United States the longest. Reid, therefore, suggests that learning style preferences can be modified.

In general terms, Reid (1998) argues that if researchers are to improve the reliability and validity of their studies, they must follow several guidelines before deciding which instrument to use with their subjects. These guidelines include determining whether the instrument has been normed with the target population, and whether the validity and reliability has been replicated with a similar population.

Anthony Gregorc

Gregorc (1979) defines learning style as distinctive and observable behaviors that provide clues about the mediation abilities of individuals and how their minds relate to the world and, therefore, how they learn. In the late 1960's research studies investigating how individuals learn, produced very different assumptions (Curry, 1983; Dunn & Dunn, 1978; Gardner, 1983; Gregorc, 1985; Kolb, 1976; & Ramirez & Castenads, 1974). Gregorc (1985) agreed and also suggested that students and teachers clash when teachers fail to present new material through the student's learning style preference. He identified different types of student learners as preferring orderly, analytic material and those who preferred broad, global ideas. So, he further indicated students could be categorized as concrete/sequential, concrete/random, abstract/sequential, or abstract/random learners, and should be aware of their

individual modes of learning. Gregorc (1985) is among those who concurred with the theory of multiple methods of learning. In fact, the issue of learning styles has also been addressed as a consideration of “possible factors that lead to college success” (Clark-Thayer, 1987, p.163). Since then, numerous tests, questionnaires, and inventories have also been developed to measure a wide range of style-related constructs. Gregorc’s Mind Styles, which graphs people’s relative strength on abstract-concrete and sequential-random axes, is an example related to the information processing level.

Gregorc (1979) postulated that individuals learn in a combination of dualities, divided the learning process into quadrants—concrete-sequential, concrete random, abstract-sequential and abstract random. Emerging from the diversity of cognitive learning models, his idea is a shared perspective that learning styles represent distinctive and fairly consistent modes of responding to and processing information (Gregorc, 1979; Keefe, 1987; Witkin, 1977). In addition, learning styles have been shown to vary from one individual to another and to carry the markings of heredity, environment and past experience (Gregorc, 1979; Dorsey & Pierson, 1984; Kolb, 1984).

A number of researchers have investigated a variety of complex cognitive profiles (Gregorc, 1984), so learning styles can be formed by both nature and nurture factors (Gregorc, 1979; Kinsella, 1995). Following this idea, Gregorc (1979) indicates that "style appears to be both nature/nurture in its roots" (p. 234). Learning patterns of adapting to environments are formed by generic coding systems and environment and culture.

Gregorc’s Style Delineator (GSD) recognizes the primacy of two processes in learning. These processes, called mediation abilities, are bipolar and recognize the importance of perception. According to him, most people have a stronger predisposition to one, two, or

possibly three, but not all four of them, thus differing in some ways. Gregorc recognizes that concrete sequential learners tend to be hands-on, while abstract sequential learners are more visual, and abstract random learners prefer multisensory tasks. Gregorc's Style Delineator is commercially available and asks the respondent to rank order ten sets of four words that correspond to the four poles of the two mind qualities. Students and faculty can self-administer, self-score, and self-interpret the GSD.

Rebecca L. Oxford

In her research, Oxford (1995) supports her arguments describing the results of style surveys she has undertaken with language teachers and learners. She has noted that between 50-80 percent of the people in any group express a major style preference for visual learning. Oxford (1993) examined the influence of learning styles on students' Japanese language achievement and the most prevalent learning styles in this study were visual and a combination comprised of visual and auditory preferences. In this research, she argues that this is understandable due to the nature of the instruction. In terms of achievement, she found that students who preferred visual learning had higher Japanese test scores.

Oxford (1993) supports the view of styles change and states that although learners may have initial style preferences, these preferences can alter over time. Oxford and Lavine (1992) go further, suggesting that style conflicts may affect students' performances and their chances of success. Furthermore, "learners whose style preference is conspicuously different from the teacher's may be plagued by anxiety and respond negatively to the teacher, the classroom, and the subject matter"(p. 38).

Madeline E. Ehrman

Ehrman (1996) states that most of the learners she has encountered indicate that visual learning styles are their strongest preference, with kinesthetic second, and auditory third. She supports this view, arguing that “learning styles are often linked with personality and therefore difficult to change” (p. 163). Oxford, Ehrman and Lavine (1991) argue that “teachers tend to mirror their own learning preferences in the teaching approaches they bring to the language classroom, unless they are overridden by the way they themselves were taught” (p. 10). They suggest that “pedagogical skirmishes” are often a result of differences in the perceptual preferences of teachers and their students.

Ehrman (1986) argues that the best approach for learning styles researchers is to combine a number of different assessment tools to gather information about the subjects. The best information is that which comes from multiple sources. Each source sets up hypotheses that you can use the other sources to test. If all sources seem consistent, your hypothesis is supported. According to her, if there is contradiction among the data sources, a researcher will need to come to conclusions carefully. Doing that, she tries out different interventions to see which work and which do not. She emphasizes that the good side of contradictory data that can otherwise be so frustrating is that “they give us the opportunity to make new discoveries about our student and about our conceptual frameworks” (p. 199).

Learning Styles and Learning Strategies Related to Research Questions

Learning styles and learning strategies affect the way students learn and the way students respond to a learning experience. Dunn and Dunn (2005) advocated that students’ achievement and motivation increase when teachers take into consideration the variety of skills that are present in the classroom. While many of the studies into learning styles and learning strategies

focus on individual differences, there is a great deal of research which has examined how preferences are shared by specific groups. Three of the variables which have been examined in these studies are gender, age and cultural background.

Gender

Students are expected to develop the “ability to adapt and respond effectively to different learning stimuli and environments” (De Vita, 2001, p. 172), and also to assess their weakness and strengths, plan their personal development and monitor progress. The main point in regard of learning styles research is that each learner tends to learn in a different way. Even so, we cannot consider these different approaches as a reflection of ability or intelligence, but a way of combining preferences and cognitive tendencies.

Andreou, Andreou & Vlachos (2008) developed a study with 452 undergraduate students (146 males and 306 females) at a medium-sized university in central Greece, whose native language was Greek, and none of their parents spoke another language at home. In their study, females performed better than males in both syntax and semantics, confirming earlier studies which found a female advantage for verbal skills (Gordon & Lee, 1986; Stumpf, 1995). According to them, “the study supports the idea that learning styles may be important factors for teachers to take into account when designing and delivering their programs and providing guidance for students” (p. 672). Plus, this is especially true in a higher education system where all students “are being required to (a) take the initiative in learning, (b) move away from an overreliance on lecturers, (c) accept an active student-centered approach to learning as opposed to passive, and (d) understand that they should learn not just for the purposes of assessment but for their own intellectual growth, pleasure, and fulfillment” (p. 672).

The findings of learning researches show us that gender is a significant variable in using strategies to learn a second language (Oxford, 2002), and apparently the most frequent analysis of individual differences in learning researches is gender. Plus, in Oxford & Nyikos (1989) we can see that one result common to many studies is that women possess a greater propensity to use learning strategies than men. Lin (2011), in his study, recruited 117 participants (74 males and 43 females) who took Freshman English courses and examined whether there were significant differences in language performances of males and females in terms of comprehension and vocabulary learning. For him, the results provided potentially useful data for better understanding both genders' second language acquisition in a learning environment context in terms of attentive activities, for example. Batters (1986) shows us that females spend more time than males in strategy activities. According to him, attentive activities included "listening to the teacher, to the tape, to other classmates, observing and reading" (p. 78). Furthermore, in regard to categories of compensation and affective strategies, Goh and Foong (1997) found that there were significant differences between males and females.

Age

Students' awareness of their learning style preferences can lead to improving student performance and learning outcomes (Braio, *et al.*, 1997; Burke & Dunn, 2002; Claxton & Murrell, 1987; Claxton & Ralston, 1978; Dunn & Dunn, 2008; Dunn, 2009; Pritchard, 2005; Sims & Sims, 1995). When students understand more about their own preferences for learning, they are also learning how to learn, which is "an empowering experience that students need if they are to be successful lifelong learners" (Claxton & Murrell, 1987, p. iv).

Just like gender, age has an influence on learning styles. Several studies have examined the impact of age on students' learning styles. Kinsella (1995) states that domains develop and

become more integrated with age. In her point of view, children are more tactile and kinesthetic in the primary grades. However, they demonstrate that visual preferences are their main domain at the second grade. In terms of auditory preferences, they acquire them at the end of elementary school. In another study, Keefe (1987) states that when students are mature, their perceptual preferences change from kinesthetic to visual and auditory.

In Simon (2010) we observe that a first important topic in the study of SLA in children is the effect of the age at which the acquisition process starts. It is recognized that the early acquisition of a second language has an impact on the psychological/emotional state of the speaker. In the learning strategies field “researches have shown that people who start learning a second or third language at an early age suffer less from foreign language anxiety than older learners” (p. 947). His findings provide a strong argument for adapting instruction methods to the age of the learners. Guion, Flege, Liu, & Yeni-Komshian (2000) investigated the age effect on speech rate and sentence duration - the equivalent to speech rate. They worked with a sample of 240 immigrants in Canada who spoke either Korean or Italian as their first language, and the results from the study demonstrated a strong relationship between the variable age and achievement of a specific language acquisition.

Cultural Background

According to Kirby (1979), learning style emerged as a common term during the 1970s, as researchers began to look for ways to combine course presentation and materials to match the specific needs of different learners. For these researchers, learning style became an umbrella term which encompassed cognitive style. Jones (1998) argues that the main difference between the two terms is that cognitive style is a bipolar dimension, whereas learning style models encompass a wider range of variables. These variables are discussed by Galloway and Labarca

(1990) when they say that learning style is a composite of environmental and perceptual preferences, which influence our physical and sensing needs; in terms of cognitive variables, they argue that these determine how we approach, conceptualize, and structure our world; and in regard to social preferences, they state that these preferences arise from cognitive, personality, and affective factors and shape our behavioral tendencies in learning situations (p. 113).

An important statement that Nelson (1995) provides in regard to learning styles studies is that individuals learn differently, whereas culture refers to what is shared by a group of individuals. In his explanation, he clarifies this idea by pointing out that culture is not only shared but learned through one processes of socialization in which family, friends and schools have a fundamental role.

According to Young (1987), “the teaching of English to speakers of other languages, like any teaching, does not occur in a socio-cultural vacuum” (p. 15). For him, the environment in which a learner grows, including the expectations of the community’s members, establishes his culture in the learning field. Hence, learning styles research may definitely help students to find out a way to improve their achievement levels, especially considering their cultural backgrounds.

Based on these statements, and based on statements of Politzerof & McGroarty (1985), we could imply that if different types of learners are defined by cultural background, in the same way they are predisposed to use different types of strategies. As we see in Richard (1994), when language learners encounter language learning tasks such as reading or writing, they can apply the several different strategies to complete the tasks. So, it becomes indispensable that researches properly investigate the effects of cultural background in determining strategy preferences, since language learners will be successful in the tasks due to use of an appropriate language learning strategy (Oxford, 1990) .

The VARK Questionnaire

As a result of numerous universal observations about learning, researchers in education have proposed and evaluated many theories and instruments intended to help either the teacher or the learner become aware of learning preferences so that the instructional environment can be tailored to learner needs. One of the more popular instruments of this type is the VARK, developed by Neil Fleming (2001), a sensory model that is an extension of the earlier neuro-linguistic model (Eicher, 1987), whose acronym stands for Visual (V), Aural (A), Read/Write (R), and Kinesthetic (K). Fleming (2001) defines learning style as “an individual’s characteristics and preferred ways of gathering, organizing, and thinking about information. VARK is in the category of instructional preference because it deals with perceptual modes, and it is focused on the different ways that we ‘take in’ and ‘give out’ information” (p. 1).

Its popularity comes from its face validity, its simplicity, its ease of use, and the wealth of learning materials that have been designed to accompany it. Most users have very practical reasons for using it. Many want to increase awareness and conversation about learner differences as a precursor to encouraging teachers to use more varied instructional methods. Some want to help students become aware of their own preferences so that those students can better plan their own learning strategies to take advantage of their strengths. The VARK Questionnaire provides metrics in each of the four perceptual modes, with individuals having preferences for anywhere from one to all four. Individual students have relative preferences along each of the four perceptual modes but can learn to function in the other modes (Fleming, 2001).

VARK focuses on the sensory modality dimension of learning, which is the way that information is taken in and processed by a learner: visual, aural, read/write, or kinesthetic. Visual learners prefer graphical and symbolic information; Aural learners prefer lectures, tutorials and discussion; Read/write learners prefer printed information, and Kinesthetic learners prefer

experience and practice using multiple perceptual modes including sight, sound, and touch (Fleming & Mills, 1992). The VARK questionnaire offers sixteen statements that describe a situation and asks the respondent to pick one or more of three or four actions that the respondent would take. Each action corresponds with a VARK Learning Style preference. The total of all four scores ranges from 13 to 48, with individuals having a preference for one, two, three, or all four of the learning channels.

Leite, Svinicki and Shi (2010) examined the dimensionality of VARK, and conducted multi-trait and multi-method confirmatory factor analysis (MTMM-CFA) to validate its internal structure. Their analysis produced reliability estimates of .85, .82, .84, and .77 for the visual, aural, read/write, and kinesthetic subscales of VARK and validated its use as a diagnostic tool (Leite, Svinicki, & Shi, 2010).

The VARK instrument has become a popular learning style instrument because it is based on real-life situations that users easily relate to and because it is easy to use (Leite, Svinicki, & Shi, 2010). Additionally, VARK has been used in various ways to explore student preferences for course delivery mode, assessment method, and course effectiveness.

The Strategy Inventory for Language Learning (SILL)

The Strategy Inventory for Language Learning (SILL), a self-report survey of strategies for second language (L2) learning, was first published in 1986. It was created on behalf of the Army Research Institute for the Behavioral and Social Sciences, known as ARI, and the Defense Language Institute Foreign Language Center, or DLI (Oxford, 1986). The questionnaire was designed by Oxford (1986) and, basically, gives information about how learners enhance the acquisition of knowledge regarding a foreign language. This questionnaire currently used all

over the world provides information linked to learning techniques from analysis and evaluation of its questions and answers.

The SILL presents different uses for individuals and groups. Among them it is possible for students to assess their own use of L2 strategies and to determine whether the strategies they are using are the most appropriate for their own language learning goals and requirements. Instructors, whom studies show to be generally unaware of their students' learning strategies, can use the SILL to heighten their awareness of learning strategies of students. In addition, instructors can use SILL results to assess the appropriateness of their students' strategies, by individual or by class. (Oxford, 1986).

For Oxford (1986) “unlike many other surveys of learning strategies, the SILL was developed from a comprehensive, systematic taxonomy of L2 learning strategies. The taxonomy itself was created as a result of an extensive research review of general and L2 learning strategies” (p. 03). Accordingly, we can see over her studies “although many learning strategy instruments have either no assessment of overall reliability or have a low assessed reliability, the SILL has a reliability of .95 for the whole survey using Cronbach's coefficient alpha. Furthermore, analysis of the test-retest reliability of the SILL is underway” (p. 38). Going beyond its initial purpose, the SILL has other uses for students, teachers, counselors, curriculum designers, language program administrators, researchers, and others who are interested in how people learn languages.

Chapter 3

Methods

Introduction

This chapter reinforces the purpose and the research question for the study. In addition, it defines the design and describes the participants of the study; also, it presents how the data collection method was developed, including demographic information. It specifies the VARK questionnaire and the Strategy Inventory for Language Learning, and their validity and reliability. Plus, it illustrates the data analysis used in the study.

Purpose of the Study

The purpose of this study was to examine the relationship between learning styles and second language acquisition. This is clearly an area which needs investigation, and addresses questions concerning the evolution, modification, and/or expansion of learning styles, and the relationship of such changes to cultural adjustment (Reid, 1987). An additional purpose of this study was to identify the nature of perceptual learning style preferences as well as students' strategies selection, in order to better understand the relationship that exists between second language students' learning styles and preferred learning strategies based on gender, age and cultural background. The VARK Questionnaire Scoring Chart and the Strategy Inventory for Language Learning (SILL) were used to identify how students learn and process information using their own special styles and strategies.

Research Questions

This study addressed the following research questions:

1. What are the preferred learning styles of second language students in an English acquisition environment, based on gender, age and cultural background?
2. What are the preferred learning strategies of second language students in an English acquisition environment, based on gender, age and cultural background?
3. What is the relationship between second language students' learning styles and preferred learning strategies?

Design of the Study

The design of this study fits the category of descriptive research since it gathered information from participants through a survey. Based on the objectives of the study, a descriptive non-experimental research method was used to collect data from several sources. In a cross-sectional approach, data were collected at one point in time (Creswell, 2003). A cross-sectional approach was used to gather the data of 101 international students attending English as a Second Language programs at two Southern universities and one for profit company teaching ESOL also in the Southern part of the United States. In this study, the data were collected through demographic and self-reported questionnaires. Participants answered questions from a demographic questionnaire developed by the researcher, including questions in regard to gender, age, country of origin, first (native) language, level of education, years of study of English, period of time living in United States, and program enrollment. In addition, the VARK Questionnaire Scoring Chart and the Strategy Inventory for Language Learning (SILL) were used to identify how students learn and process information in their own special styles and strategies.

Participants

Participants were recruited from international students attending The English as a Second Language Program at two Southern universities and one for profit company teaching ESOL also in the Southern part of the United States. A pool of 101 participants participated in the study. They were attending intermediate or advanced level of English as a Second Language courses. Furthermore, they were considered to be ideal for this study since they were expected to be sufficiently proficient in English to complete a survey that required them to pay attention to both form and meaning without struggling excessively with the language, unlike students at the beginners' level.

Data Collection

The participants consisted of 101 international students attending English as a Second Language Program at two Southern universities and one for profit company teaching ESOL also in the Southern part of the United States. The data collection followed the guidelines provided by the Institutional Review Board (IRB) at Auburn University, whose permission is attached (Appendix 3). The data were collected in the classroom, where the researcher visited and presented the study to students. In this occasion, each student received an envelope containing an information letter, and after reading it, they decided to participate in this study and the surveys were administered.

The students answered eight questions from the demographic questionnaire, and after that, they completed the VARK Questionnaire and the Strategy Inventory for Language Learning (SILL). The VARK consists of 16 questions and offers statements that describe a situation and asks the respondent to pick one or more actions that the respondent would take. Each action corresponds with a VARK Learning Style preference; the Strategy Inventory for Language

Learning (SILL) consists of 18 questions and gives information about how learners enhance the acquisition of knowledge regarding a foreign language. These instruments are not timed and usually take fifteen minutes to complete. After students completed the VARK and the SILL, the instruments were delivered to the researcher to score their individual results. In order to analyze the data, the anonymous surveys were coded from 1 to 101 (total number of participants).

Instrumentation

A comprehensive instrument enhances the teacher's ability to prescribe instructional alternatives and the student's for significant academic improvement (Campbell et al. 1996). To accurately identify students' learning styles and strategies, researchers must have a reliable and valid instrument for identifying their competences. The survey used in this study had three parts. Part one consisted of demographic questions; part two was the VARK Questionnaire Scoring Chart, and part three was the Strategy Inventory for Language Learning (SILL).

VARK focuses on the sensory modality dimension of learning, which is the way that information is taken in and processed by a learner: visual, aural, read/write, or kinesthetic. The VARK Questionnaire provides metrics in each of the four perceptual modes, with individuals having preferences for anywhere from one to all four. Individual students have relative preferences along each of the four perceptual modes but can learn to function in the other modes (Fleming, 2001).

This instrument was selected because it is concise and quick (Murphy *et al.*, 2004). The VARK questionnaire offers sixteen statements that describe a situation and asks the respondent to pick one or more of three or four actions that the respondent would take. Each action corresponds to a VARK Learning Style preference; so, this questionnaire was scored to represent their learning preferences.

In this study, the total VARK score was computed by adding all responses of students on the 16 questions of the test. Preferences were ranked by calculating the total number of each response (Visual, Aural, Read/write, and Kinesthetic). Each category was equally weighed and the most frequent preference was defined as the dominant preference.

The SILL Questionnaire was designed by Oxford (1986) and gives information about how learners enhance the acquisition of knowledge regarding a foreign language. According to her “the taxonomy itself was created as a result of an extensive research review of general and L2 learning strategies” (Oxford, 1986, p. 03).

This questionnaire currently is used worldwide, providing information linked to learning techniques, from analysis and evaluation of its questions and answers. It presents different uses for a different individuals and groups. Students can employ the SILL to assess their own use of L2 strategies and to determine whether the strategies they are using are the most appropriate for their own language learning goals and requirements.

The SILL originally contained a 50-item five-point likert-scale, which in this study was adapted to an 18-item five-point likert-scale, ranging from 'never' to 'always'. It is used to assess a broad range of L2 learning strategies, measuring the frequency with which a student uses memory, cognitive, compensation, under direct class, and metacognitive, affective and social language learning strategies, under indirect class (Fahim & Noormohammadi, 2014).

Validity and Reliability of VARK and SILL

The validity of VARK is discussed by Fleming (2001) when he presents research that supports the use of the instrument in identifying learning preferences of students. The results presented indicate higher student performance involving students' learning styles identified by the VARK instrument. According Zapalska & Dabb (2002), we could determine its validity in

two ways – the first, is whether the power of the instrument is to discriminate meaningful groups of differences in learning style preferences; the second is whether teaching a student with techniques that match his or her learning style improves achievement and satisfaction with learning.

Leite, Svinicki & Shi (2010) state that arguments about the validity of the scores of a learning styles instrument should be supported by multiple sources of evidence, and that an extensive collection of validity information for the scores of a learning style instrument would require several studies with both qualitative and quantitative analyses. They conducted multi-trait multi-method confirmatory factor analysis (MTMM-CFA) to validate its internal structure, and their analysis produced reliability estimates of .85, .82, .84, and .77 for the visual, aural, read/write, and kinesthetic subscales of VARK and validated its use as a diagnostic tool (Leite, Svinicki, & Shi, 2010).

In Oxford (1995) we observe that, in regard to questions of validity and reliability of the Strategy Inventory for Language Learning (SILL), research strongly supports the notion that frequent use of language learning strategies is connected to L2 achievement. According to Oxford and Burry-Stock (1995) “although many learning strategy instruments have either no assessment of overall reliability or have a low assessed reliability, the SILL has a reliability of .95; furthermore, analysis of the test-retest reliability of the SILL is underway” (p. 38). The internal consistency of SILL ranges from .89 to .98 in various studies, and to them, "the reliability of the SILL is very acceptable" (p. 6). Something very similar is found by Hong-Nam and Leavell (2006), who state that several studies by researchers have all revealed reliability indices higher than 0.90 for the SILL.

Data Analysis

A total of 101 students (57 females and 44 males) returned their questionnaires. Participants were recruited from international students attending The English as a Second Language Program at two Southern universities and one for profit company teaching ESOL also in the Southern part of the United States. They answered questions from a demographic questionnaire developed by the researcher. In addition, the VARK Questionnaire Scoring Chart and the Strategy Inventory for Language Learning (SILL) were used to identify how students learn and process information in their own special styles and strategies. The questionnaires were compiled and the data from the questionnaires were input by the researcher. The Statistical Package for the Social Sciences (SPSS), was used to analyze collected data, and the analysis methods were conducted through a descriptive analysis according to the research questions. For properly developing this analysis, all items' frequencies were checked; means and standard deviations of all items and the reliabilities scales were also calculated. Then, the descriptive analysis was conducted to examine demographic variables and to answer research questions.

Chi-square analysis was used to assess participants' variables such as gender, age, country of origin, first (native) language, level of education, years of study of English, period of time living in United States, and program enrollment, related to domains established by the VARK Questionnaire Scoring Chart. The independent sample t-test and Factorial ANOVA were used to examine the differences of strategy use among students to identify the relationship between variables most significantly correlated with learning styles and learning strategies preferences identified by the Strategy Inventory for Language Learning (SILL).

Summary

In this chapter, the purpose and research questions for the study are presented. In addition, it also describes the design of the study and the participants, as well as explaining the

data collection method; the description of the demographic information sheet, the VARK and the SILL are presented, including a discussion of the validity and reliability of these instruments.

The data analysis presented in this study is based on descriptive statistics used to describe the participants' variables. To assess them, a Chi-square analysis was used. Then, the independent sample t-test and Factorial ANOVA were used to examine the differences of strategy use among students to identify the relationship between variables most significantly correlated with learning styles and learning strategies preferences identified by the Strategy Inventory for Language Learning (SILL).

Chapter 4

Findings

Introduction

This chapter reaffirms all study which is stated in the purpose and in the research questions of this dissertation. The demographic profile of the participants is also included, as well as the results of the chi-square analyses used to investigate the relationship between students' learning styles, learning strategies, age, gender and background. All data collected were handled following the guidelines from the Institutional Review Board at Auburn University (see Appendix 3). In addition, the results and findings for each research questions were presented along with descriptive and inferential analyses in tables. This chapter concludes with a summary of the results. The Statistical Program for Social Science (SPSS) software was used to analyze the data.

Purpose of the Study

The purpose of this study was to examine the relationship between learning styles and second language acquisition. This is clearly an area which needs investigation, and addresses questions concerning the evolution, modification, and/or expansion of learning styles, and the relationship of such changes to cultural adjustment (Reid, 1987). An additional purpose of this study was to identify the nature of perceptual learning style preferences as well as students'

strategies selection, in order to better understand the relationship that exists between second language students' learning styles and preferred learning strategies based on gender, age and cultural background. The VARK Questionnaire Scoring Chart and the Strategy Inventory for Language Learning (SILL) were used to identify how students learn and process information using their own special styles and strategies.

Research Questions

This study addressed the following research questions:

1. What are the preferred learning styles of second language students in an English acquisition environment, based on gender, age and cultural background?
2. What are the preferred learning strategies of second language students in an English acquisition environment, based on gender, age and cultural background?
3. What is the relationship between second language students' learning styles and preferred learning strategies?

Participant Source

Participants were recruited from international students attending The English as a Second Language Program at two Southern universities and one for profit company teaching ESOL also in the Southern part of the United States. A pool of 101 participants participated in the study. They were attending intermediate or advanced level of English as a Second Language courses. Furthermore, they were considered to be ideal for this study since they were expected to be sufficiently proficient in English to complete a survey that required them to pay attention to both form and meaning without struggling excessively with the language, unlike students at the beginners' level.

Participants by Age

Participants ranged from 19 to 47 years of age with a mean age of 26.1 (SD = 6.68). The mean and standard deviation by age are provided in Table 1.

Table 1

Mean and Standard Deviation by Age (N=101)

	Minimum	Maximum	Mean	Std. Deviation
Student Age	19	47	26.1	6.68

Table 2

Distribution and Percentage of Participants by Age (N=101)

<i>Age</i>	<i>N</i>	<i>%</i>
19	11	10.89%
20	4	3.96%
21	13	12.87%
22	7	6.93%
23	9	8.91%
24	9	8.91%
25	5	4.95%
26	8	7.92%
27	4	3.96%
28	5	4.95%
29	3	2.97%
30	4	3.96%
31	3	2.97%
33	1	0.99%
34	2	1.98%
35	3	2.97%
36	2	1.98%
37	1	0.99%
38	1	0.99%
42	1	0.99%
44	1	0.99%
45	2	1.98%
46	1	0.99%
47	1	0.99%

Participants by Gender

Out of the 101 students, there were 57 female (53.43%) and 44 males (43.56%).

Participants in this study were reasonably well distributed by gender (see Table 3).

Table 3

Distribution and Percentage of Participants by Gender (N=101)

Gender	<i>N</i>	%
Female	57	53.43%
Male	44	43.56%

Participants by Nationality

The participants by nationality consisted of 60.39% Asian; 16.83% Arab/Middle Eastern; 3.96% African; 2.98% European; and 15.84% from Brazil, Mexico and Panama. Most of the participants of this study were born in Asia. Distribution and percentage of participants by nationality are presented in Table 4.

Table 4

Distribution and Percentage of Participants by Nationality (N=101)

Nationality	<i>N</i>	%
Asia	61	60.39%
China	26	25.74%
South Korea	21	20.79%
Vietnam	5	4.95%
Bangladesh	3	2.97%
Japan	2	1.98%
Thailand	2	1.98%
India	2	1.98%
Middle East	17	16.83%
Saudi Arabia	10	9.90%
Turkey	5	4.95%
Jordan	2	1.98%

Africa	4	3.96%
Congo	2	1.98%
Nigeria	1	0.99%
Ivory Coast	1	0.99%
Europe	3	2.98%
Spain	2	0.99%
Switzerland	1	0.99%
America	16	15.84%
Brasil	14	13.86%
Panama	1	0.99%
Mexico	1	0.99%

13.86% of the participants were high school graduates; 58.41% were undergraduate students, and 27.72% were graduate students. In this study, participants who had an undergraduate degree were the majority. In terms of years of study of English, participants who studied English less than 5 years consisted of 30.69%, as well as those who studied between 5 and 10 years. Those participants who studied English more than 10 years consisted of 38.61%. Participants in this study were nearly equally distributed. Distribution and percentage of participants by level of education and years of study of English are presented in Table 5.

Table 5

Distribution and Percentage of Participants by Highest Education Level and Years of Study of English (N=101)

	<i>N</i>	<i>%</i>
Highest Education Level		
High School	14	13.86%
Undergraduate	59	58.41%
Graduate	28	27.72%
Years of Study of English		
Less than 5 years	31	30.69%
5 – 10 years	31	30.69%
More than 10 years	39	38.61%

Participants by Learning Styles Domains

The VARK survey results identify students as unimodal (using only one of the four modes) or multimodal (bimodal, trimodal or quadmodal) in their learning preferences (James, D'Amore & Thomas, 2011). Zapalska and Dabb (2002) state that it is not expected that any single learning preference or mode will be dominant or that people are only uni-modal. "Some students will be bimodal if only two learning styles are preferred; students with three preferred learning styles will be trimodal" (p. 86). In addition, they emphasize there is the possibility of students presenting differences in their scores that indicate they are quadmodal in their learning preferences. No student is restricted to only one of the four modes. They may exhibit a strong preference for one particular mode and at the same time they may have a relative weakness or strength in some other modes (Zapalska & Dabb, 2002).

Fleming (1995) modified the previous VAK theory, by dividing the visual mode into images (true visual) and text/print (read/write) modes (Clark, 2000).

Unimodal

There are differences in learning approaches for the four VARK Learning Styles. V denotes visual preference, and visual learners prefer maps, diagrams, brochures, highlighters, different colors, pictures, word pictures, and different spatial arrangements (Hawk & Shah, 2007). Plus, they prefer to learn by seeing information presented as flow charts or enhanced with graphics. The results indicated that out of 101 participants, 7 were visual learners. It was almost the double of the number of read/write and kinesthetic learners together (see Table 6).

A denotes aural preference, and aural learners like to explain new ideas to others, discuss topics with other students and their teachers, use a tape recorder, attend lectures and discussion groups, and use stories and jokes (Hawk & Shah, 2007). Aural learners may love hearing others

and themselves speak. As Table 6 exhibits, out of 101 participants, 12 were aural learners. This result shows that aural learners were more than all other unimodal preferences together.

R denotes read/write preference, and read/write learners prefer lists, essays, reports, textbooks, definitions, printed handouts, readings, manuals, web pages, and taking notes (Hawk & Shah, 2007). The data revealed that 2 students were read/write learners (see Table 6).

K denotes kinesthetic preference, and kinesthetic learners like field trips, doing things to understand them, laboratories, hands-on approaches, using their senses, and collections of samples (Hawk & Shah, 2007). Kinesthetic learners learn best by doing things involving many senses. As identified in Table 6, 2 participants were kinesthetic learners.

Multimodal/Bimodal

The results indicated that out of 101 participants, 78 were multimodal learners; among them, 26 were bimodal learners. In terms of bimodal learners, the results indicated that 7 were visual/aural learners; 2 were visual/read learners; 3 were visual/kinesthetic learners; 3 were aural/read learners; 11 were aural kinesthetic learners, and none of them were read/kinesthetic learners. Aural/kinesthetic learners were almost four times the number of visual/kinesthetic and aural/read learners; plus, aural/kinesthetic learners were almost six times the number of visual/read learners (see Table 6).

Multimodal/Trimodal

As Table 6 exhibits, out of 101 participants, 25 were trimodal learners; among them, 3 were visual/aural/read learners; 5 were visual/read/kinesthetic learners; 9 were visual/aural/kinesthetic learners, and 8 were aural/read/kinesthetic learners.

Visual/aural/kinesthetic learners and aural/read/kinesthetic learners were twice the number of visual/aural/read learners and visual/read/kinesthetic learners.

Multimodal/Quadmodal

The data revealed that 27 students were quadmodal learners, demonstrating preference for all four domains (visual, aural, read/write and kinesthetic). Quadmodal learners were more than each other group of domains surveyed - unimodal, bimodal or trimodal learners (see Table 6).

Table 6

Distribution and Percentage of Participants by Learning Styles Domains (N=101)

Learning Style Domain	<i>n</i>	%
Unimodal	23	22.77%
Visual	7	6.93%
Aural	12	11.88%
Read/Write	2	1.98%
Kinesthetic	2	1.98%
Multimodal	78	77.22%
Bimodal	26	25.74%
Visual/Aural	7	6.93%
Visual/Read	2	1.98%
Visual/Kinesthetic	3	2.97%
Aural/Read	3	2.97%
Aural/Kinesthetic	11	10.89%
Read/Kinesthetic	-	0.0%
Trimodal	25	24.75%
Vis/Aur/Read	3	2.97%
Vis/Read/Kinest	5	4.95%
Vis/Aur/Kinest	9	8.91%
Aur/Read/Kinest	8	7.92%
Quadmodal (Vis/Aur/Read/Kinest)	27	26.73%

Data Analysis

Research Question 1

1. What are the preferred learning styles of second language students in an English acquisition environment, based on gender, age and cultural background?

Learning Styles by Gender

Table 7 represents the distribution and percentage of participants by learning styles domains and gender. The results indicated that the majority of the students demonstrated a preference for multimodal domains. More female than male students demonstrated preferences for visual, read/write, visual/aural, aural/read, visual/aural/read, visual/aural/kinesthetic, and quadmodal (visual/aural/read/kinesthetic) domains. Among the females, visual learners (10.71%) were three times the number of read/write learners (3.57%); visual/aural (12.5%) were almost four times the number of aural/read learners (3.57%); visual/aural/kinesthetic learners (10.71%) were three times the number of visual/aural/read (3.57%), and quadmodal (28.07%) were more than unimodal (23.21%), bimodal (26.79%) or trimodal learners (23.21%).

The results in Table 7 also demonstrate that more male than female students indicated preferences for aural, visual/kinesthetic, aural/kinesthetic, and visual/read/kinesthetic learning styles domains. Among the male learners, aural (17.78%) were four times the number of other unimodal (visual, read/write, and kinesthetic) learners together (4.44%); aural/kinesthetic (13.33%) were twice the number of visual/kinesthetic learners (6.67); visual/read/kinesthetic learners (8.89) were more than four times the number of the visual/aural/read (2.22%); and trimodal (26.67%) were more than unimodal (22.22%), bimodal (24.44%) or quadmodal learners (24.44%).

Table 7

Distribution and Percentage of Participants by Learning Styles Domains and Gender (N=101)

Learning Style Domain	Female		Male	
	<i>n</i>	%	<i>n</i>	%
Unimodal	13	23.21%	10	22.22%
Visual	6	10.71%	1	2.22%
Aural	4	7.14%	8	17.78%
Read/Write	2	3.57%	-	-
Kinesthetic	1	1.79%	1	2.22%
Multimodal	44	78.07%	34	75.55%
Bimodal	15	26.79%	11	24.44%
Visual/Aural	7	12.50%	-	-
Visual/Read	1	1.79%	1	2.22%
Visual/Kinesthetic	-	-	3	6.67%
Aural/Read	2	3.57%	1	2.22%
Aural/Kinesthetic	5	8.93%	6	13.33%
Read/Kinesthetic	-	-	-	-
Trimodal	13	23.21%	12	26.67%
Vis/Aur/Read	2	3.57%	1	2.22%
Vis/Read/Kinest	1	1.79%	4	8.89%
Vis/Aur/Kinest	6	10.71%	3	6.67%
Aur/Read/Kinest	4	7.14%	4	8.89%
Quadmodal (Vis/Aur/Read/Kinest)	16	28.07%	11	24.44%

Results by Learning Styles

Visual

A chi-square test was conducted to assess the relationship between the independent variable participants' gender and the dependent variable students' score on visual domain (unimodal or multimodal) as measured by the VARK questionnaire. Results indicated no statistical significance for visual learning styles domains and gender, $X^2(1) = 1.121, p = .288$ (see Table 8).

Aural

A chi-square analysis was performed to assess the relationship between the independent variable participants' gender and the dependent variable students' score on aural domain (unimodal or multimodal) as measured by the VARK questionnaire. Results indicated no statistical significance for aural learning styles domains and gender, $X^2 (1) = .005, p = .943$ (see Table 8).

Read/Write

A chi-square analysis was completed to assess the relationship between the independent variable participants' gender and the dependent variable students' score on read/write domain (unimodal or multimodal) as measured by the VARK questionnaire. Results indicated no statistical significance for read/write learning styles domains and gender, $X^2 (1) = .007, p = .929$ (see Table 8).

Kinesthetic

A chi-square analysis was completed to assess the relationship between the independent variable participants' gender and the dependent variable students' score on kinesthetic domain (unimodal or multimodal) as measured by the VARK questionnaire. Results indicated no statistical significance for kinesthetic learning styles domains and gender, $X^2 (1) = 2.189, p = .139$ (see Table 8).

Table 8

Chi-square Analysis of Participants' Learning Styles Domains and Gender (N=101)

Learning Styles	χ^2	Df	p
Visual	1.121	1	.288
Aural	.005	1	.943
Read/Write	.007	1	.929
Kinesthetic	2.189	1	.139

Learning Styles by Age

Table 9 displays the distribution and percentage of participants by learning styles domains and age. Within the 18 - 29 year old age group, results indicated that aural learners (15.38%) were six times the number of kinesthetic learners (2.56%); aural/kinesthetic (11.15%) were almost four times the number of visual/kinesthetic learners (2.56%), and quadmodal (visual/aural/read/kinesthetic) learners (30.76%) were more than all trimodal learners together (24.34%).

The results in Table 9 indicate that within the 30 - 39 year old age group, visual learners (23.52%) were the only unimodal learners; visual/aural (11.76%) were twice the number of visual/kinesthetic learners (5.88%), and quadmodal (visual/aural/read/kinesthetic) learners (17.64%) were the same number as all trimodal learners together (17.64%). Table 10 also illustrates that, within 40 - 47 years old age group, trimodal learners were the same number as unimodal and bimodal learners together (33.33%), and no one was identified as quadmodal (visual/aural/read/kinesthetic) learner.

Table 9

Distribution and Percentage of Participants by Learning Styles Domains and Age (N=101)

Age	Unimodal Domains					
	Visual	Aural	Read/Write	Kinesthetic		
18-29 <i>n</i> =78	3 (3.84%)	12 (15.38%)	1 (1.28%)	2 (2.56%)		
30-39 <i>n</i> =17	4 (23.52%)	-	-	-		
40-47 <i>n</i> =6	-	-	1 (16.66%)	-		
Age	Bimodal Domains					
	Vis/Aural	Vis/Read	Vis/Kinest	Aural/Read	Aural/Kin	Read/Kinest
18-29 <i>n</i> =78	5 (6.41%)	-	2 (2.56%)	1 (1.28%)	9 (11.15%)	-
30-39 <i>n</i> =17	2 (11.76%)	2 (11.76%)	1 (5.88%)	-	2 (11.76%)	-
40-47 <i>n</i> =6	-	-	-	2 (33.33%)	-	-
Age	Trimodal and Quadmodal Domains					
	Vis/Aur/Read	Vis/Read/Kin	Vis/Aur/Kin	Aural/Read/Kin	Vis/Aur/Read/Kin	
18-29 <i>n</i> =78	2 (2.56%)	3 (3.84%)	7 (8.97%)	7 (8.97%)	24 (30.76%)	
30-39 <i>n</i> =17	-	2 (11.76%)	1 (5.88%)	-	3 (17.64%)	
40-47 <i>n</i> =6	1 (16.66%)	-	1 (16.66%)	1 (16.66%)	-	
<i>N</i> =101						

Results by Learning Styles

Visual

A chi-square test was conducted to assess the relationship between the independent variable participants' age group and the dependent variable students' score on visual domain (unimodal or multimodal) as measured by the VARK questionnaire. Chi-square results indicated statistical significance for visual learning styles domains and student's age group, $X^2 (2) = 7.385$, $p < .05$ (see Table 10). There is a relationship between students' age group and their preferences for visual domains. In the 18 -29 age group, 58.949% of students demonstrated preference for visual domains. In the 18 -29 age group, 58.949% of students demonstrated preference for visual domain; In regard to 30 -39 year old students, 88.2% of them demonstrated preference for

visual domain, and 33.32% of 40-47 year old students demonstrated the same preference - see Table 9.

Aural

A chi-square analysis was performed to assess the relationship between the independent variable participants' age group and the dependent variable students' score on aural domain (unimodal or multimodal) as measured by the VARK questionnaire. Chi-square results yielded statistical significance for aural domains and age group, $X^2 (2) = 12.850, p = .001$ (see Table 10). There is a relationship between students' age group and their preferences for aural domains. In the 18 -29 age group, 85.9% of students demonstrated preference for aural domains; In the same way, 47.05% of 30 -39 year old students demonstrated preference for aural domains, and 83.3% of 40-47 year old students demonstrated the same preference - see Table 9.

Read/Write

A chi-square analysis was completed to assess the relationship between the independent variable participants' age group and the dependent variable students' score on read/write domain (unimodal or multimodal) as measured by the VARK questionnaire. No statistical significance was found for read/write learning styles domains and age, $X^2 (2) = 3.238, p = .198$ (see Table 10).

Kinesthetic

A chi-square analysis was completed to assess the relationship between the independent variable participants' age group and the dependent variable students' score on kinesthetic domain (unimodal or multimodal) as measured by the VARK questionnaire. No statistical significance was found for kinesthetic learning styles domains and age, $X^2 (2) = 4.291, p = .117$ (see Table 10).

Table 10

Chi-square Analysis of Participants' Learning Styles Domains and Age (N=101)

Learning Styles	χ^2	Df	<i>p</i>
Visual	7.385	2	.025*
Aural	12.850	2	.001*
Read/Write	3.238	2	.198
Kinesthetic	4.291	2	.117

* $p < .05$

Learning Styles by Background

Table 11 displays the distribution and percentage of participants by learning styles domains and background. Within the Asian group, results indicated that aural learners (16.39%) were more than twice the number of visual learners (6.55%); aural/kinesthetic (9.83%) were six times the number of visual/read learners (1.64%), and quadmodal (visual/aural/read/kinesthetic) learners (27.87%) were more than all trimodal learners together (26.21%).

The results in Table 11 indicated that within the Middle Eastern group, visual and kinesthetic learners (5.88%) were the only unimodal learners; aural/kinesthetic (17.65%) were three times the number of visual/aural learners (5.88%), and again quadmodal (visual/aural/read/kinesthetic) learners (35.30%) were more than the number of all trimodal learners together (29.4%). Table 11 also illustrated that within the African group, unimodal learners were the same number as multimodal learners (50%), whereas within the European group no one was identified as unimodal or trimodal, only bimodal (visual/kinesthetic – 66.66%) or quadmodal (visual/aural/read/kinesthetic – 33.33%) learners. In terms of the American group, table 11 demonstrated that read/write learners were the same number as visual and aural learners together (12.5%); visual/aural (12.5%) were twice the number of aural/kinesthetic learners (6.25%), and quadmodal (visual/aural/read/kinesthetic) learners (18.75%) were more than each of the trimodal learners.

Table 11

Distribution and Percentage of Participants by Learning Styles Domains and Background
(N=101)

Background	Unimodal Domains					
	Visual	Aural	Read/Write	Kinesthetic		
Asia <i>n</i> =61	4 (6.55%)	10 (16.39%)	-	-		
Middle East <i>n</i> =17	1 (5.88%)	-	-	1 (5.88%)		
Africa <i>n</i> =4	-	1 (25%)	-	1 (25%)		
Europe <i>n</i> = 3	-	-	-	-		
America <i>n</i> = 16	1 (6.25%)	1 (6.25%)	2 (12.5%)	-		
Background	Bimodal Domains					
	Vis/Aural	Vis/Read	Vis/Kinest	Aural/Read	Aural/Kin	Read/Kinest
Asia <i>n</i> =61	4 (6.55%)	1 (1.64%)	-	3 (4.91%)	6 (9.83%)	-
Middle East <i>n</i> =17	1 (5.88%)	-	-	-	3 (17.65%)	-
Africa <i>n</i> =4	-	-	-	-	1 (25%)	-
Europe <i>n</i> =3	-	-	2 (66.66%)	-	-	-
America <i>n</i> = 16	2 (12.5%)	1 (6.25%)	1 (6.25%)	-	1 (6.25%)	-
Backgr	Trimodal and Quadmodal Domains					
	Vis/Aur/Read	Vis/Read/Kin	Vis/Aur/Kin	Aural/Read/Kin	Vis/Aur/Read/Kin	
Asia <i>n</i> =61	2 (3.28%)	4 (6.55%)	7 (11.47%)	3 (4.91%)	17 (27.87%)	
Middle East <i>n</i> =17	1 (5.88%)	2 (11.76%)	-	2 (11.76%)	6 (35.30%)	
Africa <i>n</i> =4	-	-	-	1 (25%)	-	
Europe <i>n</i> =3	-	-	-	-	1 (33.33%)	
America <i>n</i> =16	-	-	2 (12.5%)	2 (12.5%)	3 (18.75%)	
<i>N</i> =101						

Results by Learning Styles

Visual

A chi-square test was conducted to assess the relationship between the independent variable participants' background and the dependent variable students' score on visual domain (unimodal or multimodal) as measured by the VARK questionnaire. Chi-square results indicated no statistical significance was found for visual learning styles domains and student's background, $X^2(4) = 8.543, p = .073$ (see Table 12).

Aural

A chi-square analysis was performed to assess the relationship between the independent variable participants' background and the dependent variable students' score on aural domain (unimodal or multimodal) as measured by the VARK questionnaire. Chi-square results yielded no statistical significance was found for aural domains and background, $X^2(4) = 6.360, p = .175$ (see Table 12).

Read/Write

A chi-square analysis was completed to assess the relationship between the independent variable participants' background and the dependent variable students' score on read/write domain (unimodal or multimodal) as measured by the VARK questionnaire. Results indicated no statistical significance was found for read/write learning styles domains and background, $X^2(4) = 2.941, p = .567$ (see Table 12).

Kinesthetic

A chi-square analysis was completed to assess the relationship between the independent variable participants' background and the dependent variable students' score on kinesthetic domain (unimodal or multimodal) as measured by the VARK questionnaire. Chi-square results

yielded no statistical significance was found for kinesthetic domain and background, $X^2 (4) = 5.476, p = .241$ (see Table 12).

Table 12

Chi-square Analysis of Participants' Learning Styles Domains and Background (N=101)

Learning Styles	χ^2	Df	p
Visual	8.543	4	.073
Aural	6.360	4	.175
Read/Write	2.941	4	.567
Kinesthetic	5.476	4	.241

Research Question 2

2. What are the preferred learning strategies of second language students in an English acquisition environment, based on gender, age and cultural background?

SPSS software was used to perform the independent sample t-test to examine the differences of strategy use among students. According to Oxford and Burry-Stock (1995), a mean score of all participants in the range of 3.5 to 4.4 (always or almost always used) and 4.5 to 5.0 (usually used) on a SILL item was considered to reflect high use of that strategy; 2.4 to 3.4 (sometimes used) medium use, and 1.0 to 1.4 (never or almost never used) and 1.5 to 2.4 (usually not used) low use. As shown in Table 13, overall, there was no a significant difference of strategy use between students more than 25 years old (M=3.54) and less than 25 years (M=3.64). It is important to emphasize that only two age groups were analyzed (instead three groups, as studied in Research Question 1) since we were using independent t-test, so two variable would fit properly.

Table 13

Summary of Variation in Language Learning Strategy by Age (N=101)

Strategies	<25 (n=53)		≥25 (n=48)		<i>t</i>	<i>p</i>
	Mean	Stand Dev	Mean	Stand Dev		
Memory	3.23	.683	3.12	.591	.848	.398
Cognitive	3.50	.515	3.46	.669	.362	.718
Compensation	3.66	.945	3.69	.849	-.157	.875
Metacognitive	3.70	.563	3.71	.800	-.100	.920
Affective	3.72	.852	3.50	1.04	1.18	.237
Social	4.01	.778	3.71	.927	1.75	.083
Overall	3.64	.444	3.54	.544	.939	.350

Table 14 indicates that there was a significant difference of strategy use among students from Asia, Middle East, Africa, Europe and America. Memory strategy was significantly different among students. African (M=4.08) and American (M=3.32) students had a significantly greater memory strategy use than Asian (M=3.13), Middle Eastern (M=3.05) and European students (M=2.99), $t(101)=2.65$, $p=.037<.05$. There was no significant difference of other specific learning strategies in relation to background, although the results in regard to cognitive strategy are very close to a statistical significance, $t(101)=2.27$, $p=.066 >.05$.

Among these strategies, social (M=4.01) and metacognitive (M=3.76) strategies were the most often used strategies for all group of students. The means of overall strategy for all groups (M_{Asian}=3.52; M_{Middle Eastern}=3.66, M_{African}=3.77, M_{European}=3.72, M_{American}=3.71) also showed that participants in this study always or almost always used language learning strategies in their English language learning process.

Table 14

Summary of Variation in Language Learning Strategy by Background (N=101)

Strategies	Asia (n= 61)		Middle East (n=17)		Africa (n=4)		Europe (n=3)		America (n=16)		<i>t</i>	<i>p</i>
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Memory	3.13	.616	3.05	.592	4.08	.500	2.99	.884	3.32	.644	2.65	.037*
Cognitive	3.38	.549	3.48	.718	3.41	.879	3.60	.386	3.87	.444	2.27	.066
Compensation	3.64	.918	3.76	.920	3.62	1.37	3.83	.763	3.71	.773	.087	.986
Metacognitive	3.63	.713	3.97	.681	4.08	.320	3.44	.696	3.68	.576	1.27	.286
Affective	3.50	.851	3.97	1.03	3.50	.912	4.00	.500	3.65	1.23	.964	.431
Social	3.84	.798	3.73	.953	4.00	.408	4.50	.500	4.00	1.11	.622	.648
Overall	3.52	.461	3.66	.526	3.77	.527	3.72	.276	3.71	.601	.783	.539

* $p < .05$

Results indicated no significant difference was found for the use of six strategy categories between female students and male students in this study.

Research Question 3

3. What is the relationship between second language students' learning styles and preferred learning strategies?

SPSS software was used to perform the independent sample t-test to examine if there was any statistically significant relationship among students' learning styles (in unimodal or multimodal domains), overall learning strategy, affective strategy, cognitive strategy, compensation strategy, memory strategy, metacognitive strategy, and social strategy. According to results illustrated in Table 15, there was a positive correlation between aural learning style and metacognitive strategy use ($p=.035$), as well as aural learning style and affective strategy use

($p=.023$). There was no significant difference for other specific learning strategies in relation to learning styles domains.

Table 15

Summary of Variation among Learning Styles Domains and Language Learning Strategies (N=101)

Strategies	Visual		Aural		Read/Write		Kinesthetic	
	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
Memory	-.36	.712	-.58	.562	.18	.856	-.36	.717
Cognitive	1.09	.275	-.98	.331	.79	.426	1.22	.225
Compensation	1.18	.240	-.31	.753	.51	.605	1.45	.150
Metacognitive	.29	.771	2.19	.035*	.46	.641	.83	.406
Affective	-1.21	.226	2.37	.023*	-.92	.354	.06	.950
Social	-.41	.680	.59	.555	-.30	.763	.87	.386
Overall	.23	.816	.67	.506	-.13	.889	.86	.387

* $p<.05$

Summary

The data collected were handled following the guidelines from the Institutional Review Board at Auburn University. Chi-square results indicated a significant relationship between students' age group and their preferences for visual domains. Chi-square results also yielded statistical significance between students' age group and their preferences for aural domains.

Memory strategy was significantly different among students; and the independent sample t-test results indicated that there was a statistically significant relationship among students' learning styles (in unimodal or multimodal domains) and learning strategies. Chapter 5 will present the summary, conclusions, implications and recommendations for future research.

Chapter 5

Summary, Conclusions, Implications and Recommendations

Introduction

The study reported here was designed to investigate learning style and learning strategies differences among English as a second language students studying in a second language acquisition environment. Chapter 1 discussed the statement of the problem, purpose and significance of the study, research questions and limitations of the study; in chapter 2, a review of literature was provided. In the body of the study, an approach to second language acquisition in higher education was made, followed by discussions involving learners' motivation and success in second language learning. Then, an analysis about perceptual learning styles preferences and individual learner differences was developed in order to focus learning strategies and second language acquisition. Finally, important issues were discussed involving learning styles and learning strategies instruments, as well as all the main points related to the research questions. Chapter 3 presented the participants, the data collection method, a summary of the demographic information sheet, and described both the VARK Questionnaire and the Strategy Inventory for Language Learning (SILL). The validity and reliability of the instruments was discussed, followed by a explanation about the data analysis used in the study. Chapter 4 showed the demographic profile of the participants, the results of the chi-square, the independent sample

t-test and factorial ANova analysis. Chapter 5 brings together the results of this study, and includes the summary, conclusions, implications and recommendations for future research.

Purpose of the Study

The purpose of this study was to examine the relationship between learning styles and second language acquisition. This is clearly an area which needs investigation, and addresses questions concerning the evolution, modification, and/or expansion of learning styles, and the relationship of such changes to cultural adjustment (Reid, 1987). An additional purpose of this study was to identify the nature of perceptual learning style preferences as well as students' strategies selection, in order to better understand the relationship that exists between second language students' learning styles and preferred learning strategies based on gender, age and cultural background. The VARK Questionnaire Scoring Chart and the Strategy Inventory for Language Learning (SILL) were used to identify how students learn and process information using their own special styles and strategies.

Summary

Participants were recruited from international students attending The English as a Second Language Program at two Southern universities and one for profit company teaching ESOL also in the Southern part of the United States. A pool of 101 participants participated in the study. They were attending intermediate or advanced level of English as a Second Language courses. Furthermore, they were considered to be ideal for this study since they were expected to be sufficiently proficient in English to complete a survey that required them to pay attention to both form and meaning without struggling excessively with the language, unlike students at the beginners' level. From the total of 101 participants, 61 participants were from Asia (60.3%), 17 participants were from Middle East (16.8%), 16 participants were from America (15.8%), 04

participants were from Africa (3.9%), and 3 participants were from Europe (2.9%). There were 57 females (53.4%) and 44 males (43.5%). Participants in this study were nearly equally distributed by gender. Participants ranged from 19 to 47 years of age with mean age of 26.1 (SD = 6.68). The participants who were below the age of 25 (18-24) was 52.47% and those more than 25 was 47.52%. So, the majority of participants in this study were between 18-29 years of age.

The students' scores on the learning styles domains indicated that visual learners were almost the double of the number of read/write and kinesthetic learners together; aural learners were more than all other unimodal preferences together; aural/kinesthetic learners were almost four times the number of visual/kinesthetic and aural/read learners; plus, aural/kinesthetic learners were almost six times the number of visual/read learners; visual/aural/kinesthetic learners and aural/read/kinesthetic learners were twice the number of visual/aural/read learners and visual/read/kinesthetic learners; finally, the data revealed that quadmodal learners, demonstrating preference for all four domains (visual, aural, read/write and kinesthetic), were more than each other group of domains surveyed - unimodal, bimodal or trimodal learners (see Table 6).

A chi-square test was conducted to assess the relationship between the independent variable participants' gender and the dependent variable students' score on learning styles domains (visual, aural, read/write or kinesthetic - unimodal or multimodal) as measured by the VARK questionnaire. Results indicated no statistical significance for learning styles domains and gender.

A chi-square test was conducted to assess the relationship between the independent variable participants' age group and the dependent variable students' score on learning styles domains (visual, aural, read/write or kinesthetic - unimodal or multimodal) as measured by the

VARK questionnaire. Chi-square results indicated statistical significance for visual learning styles domains and student's age group. Also, Chi-square results yielded significant relationship between aural domains and participant's age group.

A chi-square test was conducted to assess the relationship between the independent variable participants' background and the dependent variable students' score on learning styles domains (visual, aural, read/write or kinesthetic - unimodal or multimodal) as measured by the VARK questionnaire. Chi-square results indicated no statistical significance for learning styles domains and student's background.

A Factorial ANOVA was conducted to examine the use of strategies among students. There was a significant difference of strategy use among students from Asia, Middle East, Africa, Europe and America. Memory strategy was significantly different among students. There was no significant difference of other specific learning strategies in relation to national origin, although the result in regard to cognitive strategy is very close to having statistical significance. Among all strategies, social and metacognitive strategies were the most often used strategies for all group of students. Plus, the means of overall strategy for all groups also showed that participants in this study always or almost always used language learning strategies in their English language learning process.

An independent sample t-test analysis was conducted to examine if there was any statistically significant relationship among students' learning styles (in unimodal or multimodal domains), overall learning strategy, affective strategy, cognitive strategy, compensation strategy, memory strategy, metacognitive strategy, and social strategy. The results illustrated that there was a positive correlation between aural learning style and metacognitive strategy use, as well as

between aural learning style and affective strategy use. There was no significant difference of other specific learning strategies in relation to learning styles domains.

Conclusions

The findings of this study indicated that the majority of students attending the English as a Second Language Program in all three ESL departments – Auburn University, Auburn University at Montgomery, and Auburn Global (a private company) – demonstrated to be multimodal (77.2%) in their learning styles preferences, whereas only 22.8% of students demonstrated to be unimodal in their learning styles preferences. Among those who were multimodal, 25.7% of students demonstrated to be bimodal; 24.7% of students demonstrated to be trimodal, and 26.7% of students demonstrated to be quadmodal (see table 6). This finding is in line with Zapalska and Dabb (2002) studies, in which they state that it is not expected that any single learning preference or mode will be dominant or that people are only unimodal. “Some students will be bimodal if only two learning styles are preferred; students with three preferred learning styles will be trimodal” (p. 86). In addition, they emphasize there is the possibility of students to present differences in their scores that indicates they are quadmodal in their learning preferences. No student is restricted to only one of the four modes. They may exhibit a strong preference for one particular mode and at the same time they may have a relative weakness or strength in some other modes (Zapalska & Dabb, 2002).

The conclusions by research questions are presented below:

1. What are the preferred learning styles of second language students in an English acquisition environment, based on gender, age and cultural background?

The findings of this study indicated that there is a relationship between visual learning styles domains and student’s age group (18-29 year old age group; 30-39 year old age group, and

40-47 years old age group). Similarly, findings indicated that there is a relationship between students' age group and their preferences for aural domains (see table 10). This finding is in agreement with the findings of Burke & Dunn, 2002; Claxton & Murrell, 1987; Claxton & Ralston, 1978; Dunn & Dunn, 2008; Dunn, 2009; Pritchard, 2005. Students' awareness of their learning style preferences can lead to improving student performance and learning outcomes. When students understand more about their own preferences for learning, they are also learning how to learn, which is "an empowering experience that students need if they are to be successful lifelong learners" (Claxton & Murrell, 1987, p. iv).

Kinsella (1995) states that domains develop and become more integrated with age. In her point of view, children are more tactile and kinesthetic in the primary grades. However, they demonstrate that visual preferences are their main domain at the second grade. Auditory preferences seem to develop by the end of elementary school. In another study, Keefe (1987) states that, when students are mature, their perceptual preferences change from kinesthetic to visual and auditory.

2. What are the preferred learning strategies of second language students in an English acquisition environment, based on gender, age and cultural background?

Findings from this study indicate that there was a significant difference of strategy use among students from Asia, Middle East, Africa, Europe and America. Memory strategy was a significant difference among students, such that African and American students had a significantly greater memory strategy use than Asian, Middle Eastern and European students. There was no significant difference of other specific learning strategies in relation to background, although the results in regard to cognitive strategy are very close to having statistical significance. Among these strategies, social and metacognitive strategies were the

most often used strategies for all groups of students. Results also showed that participants in this study always or almost always used language learning strategies in their English language learning process (see table 14).

These findings were consistent with the findings from other studies. Based on statements of Politzerof & McGroarty (1985), we could imply that if different types of learners are defined by cultural background, in the same way they are predisposed to use different types of strategies. As we see in Richard (1994), when language learners encounter language learning tasks such as reading or writing, they can apply several different strategies to complete the tasks. So, it becomes indispensable that researchers properly investigate the effects of cultural background in determining strategy preferences since language learners will be successful in the tasks due to use of an appropriate language learning strategy (Oxford, 1990). As Hosseini (2007) states, “the majority of EFL classes are mostly run through a hybrid of grammar translation method and audio-lingual methods, entails translation, repetition, memorization, recitation, and reproduction” (p. 2). Domakani, Roohani and Akbari (2007) state that memory strategies are mainly in keeping with instructional systems which are typically didactic and emphasize rote memorization. It is possible that EFL teachers may be encouraging their students, perhaps implicitly, to use memory-related strategies more than affective or social strategies in the classroom.

3. What is the relationship between second language students’ learning styles and preferred learning strategies?

The findings indicated that there was a positive correlation between aural learning style and metacognitive strategy’s use, as well as aural learning style and affective strategy’s use (see table 15). There was no significant difference of other specific learning strategies in relation to learning styles domains. These findings are supported by Dörnyei (2006) when he states that “an

activity becomes strategic when it is particularly appropriate for the individual learner, in contrast to general learning activities which a student may find less helpful” (p. 58). For him, learners engage in strategic learning if they exert purposeful effort to select and then pursue learning procedures that they believe will increase their individual learning effectiveness. Following this point of view and based on what Oxford (1990b) stated, we can say that all categories explored in this study attempt to identify what successful learners do so that these strategies can be taught to less successful learners.

Rivera-Mills & Plonsky (2007) state that “another variable closely related to the appropriate or inappropriate use of learning strategies is learning styles” (p. 540). For them, the connection between styles and strategies has been well researched. In addition, one important aspect of the connection between styles and strategies is that strategies do not function independently of styles (Cohen, 1998), so that the connection between students' styles and consequential strategy preferences must be taken into account when planning strategies training (Bull & Ma, 2001).

Implications

Definitely, an important implication of this research is linked to issues that interfere directly with the process of acquiring a second language, as well as to the analysis of the relationship involving perceptual learning styles and learning strategies. Findings of this study may help to better understand both perceptual learning style preferences and learning strategies of ESL students while in a second language acquisition environment.

For Orozco, Orozco & Todorova (2008), the human journey is punctuated by fundamental turning points – transitions that promise both risk and opportunity. With proper social supports and guidance, these transitions can lead to greater mastery, potential and self

realization. When poorly managed, however, such transitions can be debilitating and derailing. According indicated by findings, age and different backgrounds influence ESL students in their plan to develop language learning. Consequently, based on their characteristics of language and culture, different styles and strategies are determined over the language learning process, so these students will approach learning situations in a variety of ways.

Claxton and Murrell (1987) observed that knowledge of learning styles can help educators “become more sensitive to the differences students bring to the classroom. It can also serve as a guide to the design of learning experiences that match or mismatch students’ styles, depending on whether the purpose of the experience is instrumental or developmental” (p. 78). These findings may also offer new ideas in regard to the implementation of learning styles and learning strategies theories in ESL departments of colleges, universities and commercial ESL providers. The same way, they may help ESL faculties to design instructions with the aim of facilitating the acquisition of English as a second language, within a modern and technically adequate vision. For sure, to better and deeply understand the entire relevance, influence and relationship among learning styles and learning strategies in a second language acquisition environment, further research is strongly needed.

Witte and Witte (2012) emphasized that students demonstrate a “preference for a given learning style, and instructors who acknowledge these varying strengths and abilities will be able to structure successful learning experiences for their students” (p. 336). Therefore, since the goal of second language acquisition programs is to determine and develop the language proficiency levels of students in the new foreign language, a particular pedagogical approach or curriculum design will be necessary to support the students in languages taught. The most important consideration is that the learning process has to be appropriate to the aims of program

effectiveness (Upcraft & Schuh, 2002). Use of a variety of teaching and learning approaches has the potential to enhance the learning and performance for a wider range of adult students in a course and to expand the learning approaches with which adult students are comfortable and capable of learning.

Finally, most faculties in higher education initially adopt a teaching style that merges the ways they prefer to learn. In Cassidy (2004), we can see that educators are called to acknowledge and understand that students learn in different ways and are pressed to diversify instructional techniques used in the classroom. So, the environment in which second language learners are involved needs to be analyzed as a whole. Age and background are important, but it is also necessary to know the amount of years of study of a second language by the learner, as well as how long he is living in the target language country. Similarly, the understanding by the faculties of learning styles and learning strategies related to students is fundamental for an adequate view of all the variables that surround them. At this point it is necessary for the faculties to leave their comfort zone and become familiar with the whole process of acquiring a new language, a process that may be different from that which the faculties themselves used to adopt or prefer.

Recommendations for Future Research

Based on the results of the present study, the following are recommendations for future research:

- 1- Extend this study by investigating the learning styles and learning strategies of ESL students from other English as a second language programs, such as churches, foreign factories or call center companies;
- 2- Replicate this study by performing an analysis of the learning styles and learning strategies of Asian, Middle Eastern, African, European and American students attending ESL programs to identify possible changes in their preferences;

- 3- Replicate this study and explore in even more depth the ESL students' learning styles and strategies preferences based on gender, age and cultural background;
- 4- Replicate this study and explore in even more depth the relationship between learning styles and learning strategies of ESL students attending an English acquisition environment;
- 5- Replicate this study and use ESL students' highest educational level and years of study of English as variables to be calculated. These variables were included in this study; however, they were not used to present statistical results;
- 6- Investigate the learning strategies of ESL students who demonstrated their preference for being unimodal or multimodal learning styles learners. Since the majority of students in this study indicated that they were multimodal, it would be helpful to focus on this specific result;
- 7- Use the data from this study to compare ESL students' learning styles and learning strategies preferences with ESL students of other US universities;
- 8- Extend this study to compare learning styles and learning strategies preferences of ESL students attending an ESL program department with ESL students of a foreign language department within the same university;

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Appendix 1

English Language Learning Survey

Adapted from the VARK (Visual, Aural, Read/Write, Kinesthetic) Questionnaire, version 7.8

(Fleming, 2006), and version 7.0 of the Strategy Inventory for Language Learning (SILL)

(Oxford, 1990).

English Language Learning Survey

The following questions ask about your learning styles and learning strategies pertaining to English language acquisition. Answer in terms of how well the statement describes you. Do not answer how you think you should be, or what other people think you should be. Remember there are no right or wrong answers, just answer as accurately as possible. This usually takes about 10 minutes to complete. If you have any questions, let the researcher know immediately.

Part 1 – Learning Styles

Choose the answer which best explains your preference and circle the letter(s) next to it. **Please circle more than one** if a single answer does not match your perception. Leave blank any question that does not apply.

1. You are helping someone who wants to go to your airport, the center of town or railway station. You would:
 - a) go with her.
 - b) tell her the directions.
 - c) write down the directions.
 - d) draw, or show her a map, or give her a map.
2. A website has a video showing how to make a special graph. There is a person speaking, some lists and words describing what to do and some diagrams. You would learn most from:
 - a) seeing the diagrams.
 - b) listening.
 - c) reading the words.
 - d) watching the actions.
3. You are planning a vacation for a group. You want some feedback from them about the plan. You would:
 - a) describe some of the highlights they will experience.
 - b) use a map to show them the places.
 - c) give them a copy of the printed itinerary.
 - d) phone, text or email them.

4. You are going to cook something as a special treat. You would:
- a) cook something you know without the need for instructions.
 - b) ask friends for suggestions.
 - c) look on the Internet or in some cookbooks for ideas from the pictures.
 - d) use a good recipe.
5. A group of tourists want to learn about the parks or wildlife reserves in your area. You would:
- a) talk about, or arrange a talk for them about parks or wildlife reserves.
 - b) show them maps and internet pictures.
 - c) take them to a park or wildlife reserve and walk with them.
 - d) give them a book or pamphlets about the parks or wildlife reserves.
6. You are about to purchase a digital camera or mobile phone. Other than price, what would most influence your decision?
- a) Trying or testing it.
 - b) Reading the details or checking its features online.
 - c) It is a modern design and looks good.
 - d) The salesperson telling me about its features.
7. Remember a time when you learned how to do something new. Avoid choosing a physical skill (eg. riding a bike). You learned best by:
- a) watching a demonstration.
 - b) listening to somebody explaining it and asking questions.
 - c) diagrams, maps, and charts - visual clues.
 - d) written instructions – e.g. a manual or book.
8. You have a problem with your heart. You would prefer that the doctor:
- a) give you a something to read to explain what was wrong.
 - b) use a plastic model to show what was wrong.
 - c) describe what was wrong.
 - d) show you a diagram of what was wrong.
9. You want to learn a new program, skill or game on a computer. You would:
- a) read the written instructions that came with the program.
 - b) talk with people who know about the program.

- c) use the controls or keyboard.
- d) follow the diagrams in the book that came with it.

10. I like websites that have:

- a) things I can click on, shift or try.
- b) interesting design and visual features.
- c) interesting written descriptions, lists and explanations.
- d) audio channels where I can hear music, radio programs or interviews.

11. Other than price, what would most influence your decision to buy a new non-fiction book?

- a) The way it looks is appealing.
- b) Quickly reading parts of it.
- c) A friend talks about it and recommends it.
- d) It has real-life stories, experiences and examples.

12. You are using a book, CD or website to learn how to take photos with your new digital camera. You would like to have:

- a) a chance to ask questions and talk about the camera and its features.
- b) clear written instructions with lists and bullet points about what to do.
- c) diagrams showing the camera and what each part does.
- d) many examples of good and poor photos and how to improve them.

13. Do you prefer a teacher or a presenter who uses:

- a) demonstrations, models or practical sessions.
- b) question and answer, talk, group discussion, or guest speakers.
- c) handouts, books, or readings.
- d) diagrams, charts or graphs.

14. You have finished a competition or test and would like some feedback. You would like to have feedback:

- a) using examples from what you have done.
- b) using a written description of your results.
- c) from somebody who talks it through with you.
- d) using graphs showing what you had achieved.

15. You are going to choose food at a restaurant or cafe. You would:

- a) choose something that you have had there before.
- b) listen to the waiter or ask friends to recommend choices.

- c) choose from the descriptions in the menu.
- d) look at what others are eating or look at pictures of each dish.

16. You have to make an important speech at a conference or special occasion. You would:
- a) make diagrams or get graphs to help explain things.
 - b) write a few key words and practice saying your speech over and over.
 - c) write out your speech and learn from reading it over several times.
 - d) gather many examples and stories to make the talk real and practical.

Part 2—Language Learning Strategy

Please read each statement and check the box that best describes how you feel:
 1= Never or almost never true of me to 5= Always or almost always true of me

	Never or almost never true of me 1	Usually not true of me 2	Somewhat true of me 3	Usually true of me 4	Always or almost always true of me 5
Part A					
1. I use new English words in a sentence so I can remember them.					
2. I remember a new English word by making a mental picture of a situation in which the word might be used.					
3. I review the English lesson often.					
Part B					
4. I say or write new English words several times.					
5. I use the English words I know in different ways.					
6. I watch English language TV shows spoken in English or go to movies spoken in English.					
7. I read for pleasure in English.					
8. I write notes, messages, letters, or reports in English.					
9. I try not to translate word for word.					
Part C					
10. To understand an unfamiliar					

English word, I make guesses.					
11. When I can't think of a word during a conversation in English, I use gestures.					
Part D					
12. I pay attention when someone is speaking English.					
13. I plan my schedule so I will have enough time to study English.					
14. I look for people I can talk to in English.					
Part E					
15. I encourage myself to speak English even when I am afraid of making a mistake.					
16. I talk to someone else about how I feel when I am learning English.					
Part F					
17. If I do not understand something in English, I ask the other person to slow down or say it again.					
18. I practice English with other students.					

Survey adapted from the VARK (Visual, Aural, Read/Write, Kinesthetic) Questionnaire, version 7.8 (Fleming, 2006), and version 7.0 of the Strategy Inventory for Language Learning (SILL) (Oxford, 1990).

Appendix 2
Demographic Information

Demographic Information

Please first answer the following questions about yourself.

1. Gender:

Male

Female

2. Age: _____

3. Country of origin: _____

4. First (Native) Language: _____

5. Highest education level: _____

6. How many years have you been studying English in your life? _____

7. How long have you been living in the US? _____

8. Please indicate the English program you are now enrolled:

Auburn University/ESL (IEP or INTL courses)

Auburn University at Montgomery

Auburn Global

Appendix 3

IRB Approval Letter

IRB Approval Letter

Dear Hugo,

Your protocol entitled "Learning Style Preferences and their Relationship to Second Language Acquisition in Students of English as a Second Language" has been approved by the IRB as "Exempt" under federal regulation 45 CFR 46.101(b)(2).

Official notice:

This e-mail serves as official notice that your protocol has been approved. A formal approval letter will not be sent unless you notify us that you need one. By accepting this approval, you also accept your responsibilities associated with this approval. Details of your responsibilities are attached. Please print and retain.

Information Letter:

Attached is a scan of your new, stamped information letter. You must provide a copy for each participant to keep. Also attached is a scan of your approved protocol.

Expiration – Approval for three year period:

Your protocol will expire on **November 29, 2019**. About three weeks before that time you will need to submit a renewal request.

When you have completed all research activities, have no plans to collect additional data and have destroyed all identifiable information as approved by the IRB, please notify this office via e-mail. A final report is no longer required for Exempt protocols.

If you have any questions, please let us know.

Best wishes for success with your research!

Selena Hathcock

Selena Hathcock
Office of Research Compliance
115 Ramsay Hall
Auburn University, AL 36849
334-844-5966

Appendix 4

Information Letter

The Auburn University Institutional
Review Board has approved this
Document for use from
11/30/2016 to 11/29/2019
Protocol # 16-435 EX 1611



AUBURN UNIVERSITY
COLLEGE OF EDUCATION

EDUCATIONAL FOUNDATION, LEADERSHIP AND TECHNOLOGY

(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP
WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT)

INFORMATION LETTER

Learning style preferences and their relationship to second language acquisition in students of English as a Second Language

You are invited to participate in a research study to investigate learning style preferences and their relationship to second language acquisition in students of English as a Second Language. This study is being conducted by Hugo dos Santos, graduate student of Department of Educational Foundations, Leadership and Technology at Auburn University, under the direction of Dr James E. Witte, a professor of Department of EFLT. You were selected as a possible participant because you are currently enrolled as a student in the ESL program at Auburn University, and you are age 19 or older.

If you decide to participate in this research study, you will be asked to take two anonymous surveys. Your total time commitment will be approximately 15 minutes.

Your participation in this study is completely anonymous and voluntary. There are no foreseeable risks associated to this study. However, if you feel uncomfortable answering any question, you can withdraw from the survey any time. Your decision about whether or not to participate will not jeopardize your future relation with the department of EFLT and Auburn University.

There will be no cost to participation or compensation. Information collected through your participation will or may be used for dissertation, publication or profession presentation.

If you have any questions about this study, please ask it now or contact Hugo dos Santos at htd0002@auburn.edu.

If you have any questions about your rights as a research participant, you may contact Auburn University Office of Human Subject Research or the Institutional Review Board by phone (334) 844 5066, or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.

Hugo dos Santos 11/30/16
Investigator's signature Date

Hugo dos Santos

Print Name

The Auburn University Institutional
Review Board has approved this
Document for use from
11/30/2016 to 11/29/2019
Protocol # 16-435 EX 1611

Appendix 5

Permission Letters

(ESL Departments in AU, AU at Montgomery, and Auburn Global)

August 8, 2016

Auburn University Institutional Review Board
Office of Research Compliance
115 Ramsay Hall Auburn, AL, 36849

Dear Sir or Madam:

This is to inform you that Hugo Tadeu dos Santos, a PhD student in the Department of Educational Foundations, Leadership and Technology in the College of Education at Auburn University, has the permission of the ESL Program to conduct research in our classes for his study, titled "Learning Style Preferences and Their Relationship to Second Language Acquisition in Students of English as a Second Language."

Mr. Hugo dos Santos will provide students with an information letter and a questionnaire, to be distributed in the middle of the 2016 Fall semester. He will provide my office with a copy of the Auburn University IRB-approved, stamped consent document before he recruits participants, and will also provide a copy of his aggregate results.

If there are any questions, please contact my office at (334) 844-2122.

Sincerely,



Daniel Raffalovich, Ph.D.
Director, English as a Second Language Program



September 26, 2016

Auburn University Institutional Review Board
Office of Research Compliance
115 Ramsay Hall
Auburn, Alabama 36849

Dear Sir or Madam:

This letter is to inform you that Hugo dos Santos, a PhD student in the Department of Educational Foundations, Leadership and Technology in the College of Education at Auburn University, has the permission of the Auburn University at Montgomery ESL Program to conduct research in our classes for his study, titled "Learning Style Preferences and Their Relationship to Second Language Acquisition in Students of English as a Second Language."

Mr. Hugo dos Santos will provide students with an information letter and a questionnaire, to be distributed in the middle of the 2nd term of Fall 2016 semester. He will provide my office with a copy of the Auburn University IRB-approved, stamped consent document before he recruits participants, and will also provide a copy of his aggregate results.

If there are any questions, please contact my office at (334) 244-3128.

Sincerely,

Toby J. Killcreas
Associate Director
English as a Second Language Program



September 30, 2016
Auburn University Institutional Review Board
Office of Research Compliance
115 Ramsey Hall
Auburn University
Auburn, AL 36849

Dear Review Board Members:

We support the research of Hugo Tadeu dos Santos, PhD candidate in the College of Education, and give him permission to conduct research with students in our classes for his study titled, "Learning Style Preferences and Their Relationship to Second Language Acquisition in Students of English as a Second Language".

The research conducted by Hugo Tadeu dos Santos will include providing students with an information letter and a survey instrument in our classes during the Fall 2016 semester. Hugo has agreed to provide us with a copy of the Auburn University IRB-approved, stamped consent document before he collects the data, and will also provide us with the final aggregated results.

Please feel free to contact me at 504-912-9124 or at sean.busenlener@auburnglobal.org if you have any questions. We look forward to learning about the results of this research.

Sincerely,

A handwritten signature in black ink, appearing to read 'S. Busenlener', written over a light blue horizontal line.

Sean Busenlener
Assistant Managing Director
Auburn Global

Appendix 6

Permission – Dr. Rebecca Oxford

7/21/2016

Re: Fw: Use of instrument / Authorization - Hugo Dos Santos

Re: Fw: Use of instrument / Authorization

Rebecca Oxford

Thu 7/21/2016 11:37 PM

To: Hugo Dos Santos <htd0002@tigermail.auburn.edu>;

Dear Hugo,

Forgive me for not responding sooner. I am on vacation in the western part of the U.S.

You have my permission to use the SILL. I am sure you will do a good job in your research.

Warm wishes,
Dr. Oxford

*Rebecca L. Oxford, Ph.D.
Teacher, Author, and Evaluator*

On Thu, Jul 21, 2016 at 12:46 PM, Hugo Dos Santos <htd0002@tigermail.auburn.edu> wrote:

Good day, Dr Oxford...

...I imagine I am bothering you with my request, however, my research depend on your authorization.
Do you mind in taking a look in the message below.

I really appreciate that, Doc.

Have an amazing day.

Hugo dos Santos
Adult Education PhD Student
Master in Brazilian Literature
Portuguese Language / Brazilian Culture GTA
Auburn University
Foy hall
(334) 444 0118
htd0002@auburn.edu

"I know quite certainly that I myself have no special talent. Curiosity, obsession and dogged endurance, combined with