

## Revisiting the Conceptual Ambiguity of Learning Styles

Asghar Salimi<sup>1</sup>, Babak Huseynpur<sup>2\*</sup>

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1. PhD, Department of English, University of Maragheh, Maragheh, Iran.

2. PhD Candidate, Department of English, Islamic Azad University of Sarab, Sarab, Iran.

\* Corresponding Author's Email: [babak.elsan@gmail.com](mailto:babak.elsan@gmail.com)

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**Abstract** – Learning style is a construct which has various and even controversy conceptualizations and definitions proposed by scholars and researchers in educational fields. These varying and diverse definitions and conceptualizations have caused a lot of ambiguity in the literature. In the present study, the authors reviewed the most widely-discussed conceptualizations and definitions of the learning styles in general education as well as in L2 and, discussed some of the shortcomings of the learning styles literature. Ultimately, a comprehensive definition which involves various dimensions of the learning styles is proposed.

**Keywords:** learning styles, cognitive styles, learning strategies, motivational styles, L2

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### I. INTRODUCTION

In the field of educational psychology in general and language learning (ESL and EFL) in particular, the study of learning styles has suffered from several crucial problems such as “ambiguity in conceptualization and definition” (Huseynpur, Moghaddam, & Rezaie, 2015) and the way it is measured. The problems are not only confined to controversial situation in defining, conceptualizing, categorizing, and measuring learning style, but also to the research findings pertaining to it. That’s why, as Vaseghi, Ramezani and Gholami (2012) mentioned “each researcher begins his or her work by indicating the conceptual dilemma and methodological problem surrounding this concept and almost all indicate that little agreement exists about what learning styles mean or how to adequately measure it” (p. 441). Cassidy (2004) argues that “to some extent, this can be considered a natural consequence of extensive empirical investigation and is to be expected with any continually developing concept which proves useful in gaining understanding of such a crucial and prevailing endeavour as learning”(p. 420). In the present study, the authors aim to review widely-discussed theoretical and empirical literature of the learning styles, and ultimately propose a solution for the contradictory conceptualization and other problematic issues in this regard.

### II. LITERATURE REVIEW

#### A. Definition of Learning Styles

One of the main concerns among scholars in the field is the definition and conceptualization of the learning styles; that is, to the authors’ idea, the key reason being the root of the other problems. How can scholars agree upon categorizing, measuring, and

interpreting the findings if there are different definitions and conceptualizations of a set of variables? How can findings of various studies of learning styles be compared when the tools for measuring have come out of various and sometimes contradictory conceptualizations? Therefore, the first action one should take in the learning styles research is to investigate the existing definitions of the concept in the literature and then adopting the most suitable one among them or propose a new comprehensive definition which best describes the notion.

According to Reid (1995, p. viii), learning styles refer to “an individual’s natural, habitual, and preferred way(s) of absorbing, processing, and retaining new information and skills” (Reid, 1995, p. viii). We should notice that in Reid’s definition the terms ‘habitual’ implies the flexibility of the styles. In other words, habits may be subject to change depending on the situation or practice on the passage of time, because habits are changeable by means of repetition. This contradicts Keefe’s (1979) idea asserting that learning styles are relatively fixed and unchangeable.

Felder and Henriques (1995) define learning styles as “the ways in which an individual characteristically acquires, retains, and retrieves information” (p. 21). Keefe (1979) asserts that learning styles are “cognitive, affective, and physiological traits that are relatively stable indicators of how learners perceive, interact with, and respond to the learning environment” (p.4). Although these definitions “vary in terms of scope and depth” (Tabanlioğlu, 2003), they all imply the multidimensional characteristic of the learning styles.

Learning styles have been studied in different dimensions and have been related to other notions by different scholars. Some of the widely recognized dimensions or related concepts to learning styles include: perceptual/sensory learning styles, cognitive learning styles, personality traits, learning strategies.

## B. Cognitive Styles

Cognitive styles “are usually defined as an individual’s preferred and habitual modes of perceiving, remembering, organizing, processing, and representing information” (Dörnyei, 2005, p. 124). They are another aspect that has been subject of dispute among style researchers. Despite the fact that “the theoretical basis of cognitive styles is more solid than that of the learning styles, even cognitive styles have been subject to a lot of criticism” (Dörnyei, 2005, p. 126). Dörnyei (2005) criticizes that the notion of cognitive styles in the past was not a theoretical concept; it rather depended on the instruments utilized for measuring it. And because most researchers developed their own instruments, this led to the conceptualizations based on their own instruments; and as a result, these overlapping concepts that could not converge adequately, caused confusing overall picture of the notion (p. 126). While some scholars totally differentiate cognitive styles from learning styles, some others assert that they are one of the dimensions of the learning styles.

Curry (1983) assumes three-layer system for learning styles by using the analogy of the peeling of onions. According to Curry (1983), the first and the most internal layer is “personality trait” which involves the way an individual accesses and integrates information. This core layer is relatively the most stable dimension of the cognitive styles. The second

layer which is “information-processing” style refers to how individuals process information. This layer tends to be stable; however, it may be changed by instructional methods. The third layer, the outermost of them, is “social interaction” which is influenced by an individual’s interaction with learning environment as well as their peers. The third layer is the least stable layer compared to the previous ones because it is directly exposed to outside environment.

### C. Differences between Learning Styles and Strategies

Another problem in the field of learning styles is mistaking them with learning strategies by some researchers (Sternberg & Grigorenko, 2001, p. 3; Tabanlıoğlu, 2003). According to Scarcella and Oxford (1992), learning strategies are defined as “specific actions, behaviors, steps, or techniques- such as seeking out conversation partners, or giving oneself encouragement to tackle a difficult language task- used by students to enhance their own learning” (p. 63).

Reid (1998) distinguishes learning styles from learning strategies. She defines learning styles as “*internally* based characteristics, often not perceived or consciously used by learners, for the intake and comprehension of new information” (p.ix), on the other hand, she defines learning strategies as “*external* skills often used consciously by students to improve their learning” (p. ix). We can conclude that according to Reid (1998), learning styles are almost subconscious way of in-taking the information and are difficult to change while learning strategies are used consciously so they can change in the passage of time. Dörnyei (2005) remarks that the two concept of styles and strategies are “thematically related since they both denote specific ways learners go about carrying out learning tasks (p. 122). Oxford (2003) asserts that learning styles (i.e., the general approaches to learning a language) and learning strategies (the specific behaviours or thoughts learners use to enhance their language learning) are two key variables impacting language learning. Sternberg and Grigorenko (2001) differentiates strategies and styles by stressing the difference between the level of consciousness existing in the application of styles and strategies; they conclude that “strategy is used for task- or context-dependent situations, whereas style implies a higher degree of stability falling midway between ability and strategy” (p. 3).

### D. Learning Styles and Personality

Another source of controversy is the relation between learning styles and personality; because “some well-known psychological constructs are sometimes referred to as learning styles and sometimes as personality dimensions” (Dörnyei, 2005). Oxford (2003) mentioned that personality type dimension of styles is another important aspect in L2 education. According to her, personality based styles “consists of four strands: extroverted vs. introverted; intuitive-random vs. sensing-sequential; thinking vs. feeling; and closure-oriented/judging vs. open/perceiving” (Oxford, 2003). Ehrman (1996), in fact, has labelled certain learning styles as “personality-based learning styles,” since they are personality dimensions which have correlation with some cognitive styles (Ehrman, 1996).

## E. Learning Styles Dimensions

Keefe's (1979) definition considers three dimensions to learning styles: cognitive, affective, and physiological behaviour. Some scholars have informed and measured the perceptual (sensory) learning styles (Reid, 1987, 1995; Oxford and Anderson, 1995). Dunn, Beaudry, and Klavas (1989) argue that learning styles consists of variables including "individual responses to sound, light, temperature, design, perception, intake, chronobiological highs and lows, mobility needs, and persistence ...; whereas sociological preferences, motivation, responsibility (conformity) and need for structure..." (p. 56). Ehrman and Oxford (1990, as cited in Demirkol, 2009) remark the existence of at least twenty varying dimensions in learning styles.

The conclusion which Dörnyei (2005) makes of the controversial situation of learning styles is truly expressing the difficulty of defining, conceptualizing, and measuring learning styles:

I believe that the above outline of various style issues conveys well the general impression one gains when dealing with learning styles, namely that they are elusive, 'halfway' products: They refer to preferences, but these can be of varying degree; they are related to learning strategies but are somewhat different from them as they fall midway between innate abilities and strategies; they appear to be situation-independent but they are not entirely free of situational influences; and some style dimensions are also listed as major components of personality. Indeed, learning styles appear to have very soft boundaries, making the category rather open-ended, regardless of which perspective we approach it from. Ehrman et al.'s (2003) summary of the use of the term is, regrettably, valid: 'the literature on learning styles uses the terms learning style, cognitive style, personality type, sensory preference, modality, and others rather loosely and often interchangeably' (p. 314). (Dörnyei, 2005, p. 123)

## F. Researching Learning Styles in ESL/EFL

As just mentioned, the literature of language learning styles research not only has a lot in common with, but also has its roots in learning styles which are conceptualized and developed in general educational psychology. Although some of the instruments utilized in L2 have been adopted from general psychology, for instance, Kolb's (1984) Learning Style Inventory and Dunn, Dun, and Price's (1991) Productivity Environmental Preference Survey, this fact has not prevented second language scholars and researchers from adapting the tools to ESL/EFL field and developing second-language-specific instruments such as Reid's (1987) Perceptual Learning Style Questionnaire. Reid (1995) asserts that there are three major dimensions of learning styles which are well-known and related to the field of L2 learning: perceptual learning styles, cognitive learning styles and affective/temperamental learning style (Reid, 1995).

**Cognitive language learning styles.** Like in general psychology, cognitive styles have drawn lots of ESL and EFL researchers and scholars' attention. A considerable number

of instruments assessing the learning styles include totally or partially cognitive styles of the language learners.

**L2 Studies and field dependence-independence.** Field Dependence vs. Field Independence, which was developed by Herman Witkin over thirty years ago, is the initial effort to investigate learning styles in L2 studies (Dörnyei, 2005, p. 136). In this kind of research the students are divided into two categories: field dependent and field independent. “Field-dependent individuals are described as more reliant on external referents” (Coffield, Moseley, Hall, and Ecclestone, 2004, p. 39) and on the surrounding field, “which in practical terms means that they cannot see inconspicuous things right in front of their nose” (Dörnyei, 2005, p. 136). Whereas, according to Coffield *et al.* (2004), field independent people “are uninfluenced by the surrounding field (the frame)” (p. 137). Dörnyei (2005) elaborate that, field independent individuals are independent of the impact of the whole surrounding environment when they look at the parts and therefore they can notice details that field dependent people cannot see (p. 136).

Skehan (1998) summarized the widely recognized opinion concerning relation of L2 and FD vs. FI:

In sum, the FI individual benefits from the way he or she processes information but is seen to avoid situations in which language is actually going to be used for communication. FD individuals, while comfortable and sensitive in communication situations, are not seen to be effective information processors, and so, although provided with more information to work with, will exploit it less. From this one can infer that FI individuals should do better on non-communicative, more cerebral tests, while FD individuals should excel in more communicative situations, when what is assessed is language use rather than language-like use. Clearly, this is a comprehensible and attractive ‘package,’ whose lures have engaged the attentions of many researchers. (pp. 238–239)

Ellis (2008) remarks that the Group Embedded Figures Test (GEFT), which was developed by Witkin and his associates, is the most frequently used instrument to measure FD/FI in SLA research (p. 661). GEFT has received some serious criticism from scholars. For example, Griffiths and Sheen (1992) argued that GEFT is a test of “ability” rather than “style”. (p.141). Willing (1987) mentioned that another problem with the GEFT is that it may be culturally biased, discriminating certain groups against other groups. Some other scholars claim that GEFT is an aptitude test (Griffiths & Sheen, 1992; Chapelle & Green, 1992). Another problem regarding GEFT is that it only measures FI (Ellis, 2008, p. 665). Therefore it was taken for granted that if a person is not FI, so he or she would be FD! The abovementioned problems of GEFT prove this instrument inefficient to researching FD/FI. Besides problems of GEFT as an instrument, merely investigating only one component of learning styles doesn’t seem promising.

**Perceptual language learning styles.** Another term used for this aspect is sensory preferences, because it is related to the perceiving the information by means of our senses. In other words, perceptual learning styles include the way we perceive information using our senses through physical contact with learning environment. This frequently-referred

dimension of learning styles is categorized as ‘visual’, ‘auditory’, ‘kinesthetic’ and ‘tactile’ types. Kinesthetic and tactile types are often grouped as a single variable under the “haptic” style category (Sprenger, 2008). Sprenger (2008) claims that “input, output, and patterning all rely on our senses and the connections that are made to learning are via visual, auditory, or kinesthetic channels” (p. 30).

**Visual learners.** As the name suggests, visual learning style refers to learning through seeing. According to Oxford (1993), fifty per cent to eighty per cent of learners in any class would express that they are mostly visual learners. Overall, Dörnyei (2005) asserts that:

Visual learners like visual stimulation such as films and videos, and if some large chunk of information is presented orally (e.g., in a lecture) their understanding is considerably enhanced by a handout and various visual aids, such as overhead transparencies, as well as by taking extensive notes. (p. 140)

**Auditory learner.** This style represents the learners who prefer to use their listening ability in order to perceive the information. Sprenger (2008) claims that since the auditory and speech areas are located closely to one another in the brain, this kind of learners like listening to others as well as speaking to other people (Sprenger, 2008). They like and prefer listening to lectures or conversations and having interaction with others in role plays and discussions (Oxford, 2001).

**Kinesthetic/Tactile learners.** These learners are movement-oriented (Huseynpur *et al.*, 2015) and it is difficult to keep kinesthetic learners sitting on a chair for a long time because they prefer to be active physically, and they enjoy working with tangible objects, collages, and flashcard (Oxford, 2001). Although Reid (1987) differentiates tactile and kinesthetic styles as two separate styles, some other scholars (e.g. Dörnyei, 2005; Sprenger, 2008) group them as one category because some research results have proved that tactile style is strongly correlated to kinesthetic style. According to Sprenger (2008) kinesthetic learners are of three types: hands on learners, whole body learners, and doodlers. Hands on learners learn through manipulating objects; whole body learners intake information by becoming bodily involved in learning; doodlers learn through drawing something while listening to information simultaneously.

## G. Assessing Language Learning Styles

In the field of second and foreign language, teachers and researchers have used a number of published instruments available for measuring language learners’ styles. As mentioned before, some of these models and instruments have been developed by educational psychologists namely: Riding’s (1991a, 1991b, 1998a, and 1998b) model of cognitive style and his Cognitive Styles Analysis (CSA) and Kolb’s (1976, 1985, and 1999) Learning Style Inventory (LSI) (cited in Cofield *et al.*, 2004). But there are some other instruments which have been developed by EFL/ESL scholars or for the purpose of investigating specifically language learners’ learning styles for instance: Reid’s (1987, 1995) Learning Style model and her Perceptual Learning Style Preference Questionnaire.

**Reid's Perceptual Learning Style Preference Questionnaire.** The earliest and the most widely used instrument in L2 field is Reid's (1987, 1995) Perceptual Learning Style Preference Questionnaire (Vaseghi *et al.*, 2012; Dörnyei, 2005; DeCapua & Wintergerst, 2005). This instrument was originally developed and validated by Reid for investigating second language learners in the United States. Reid (1987) studied perceptual learning style preferences amongst non-native speakers of English who studied in the United States as well as native English speakers representing 98 countries, 29 major fields of study, and 52 language backgrounds. Her survey, which was originally created in 1984, consisted of 30 statements for six learning style preferences: visual, auditory, kinesthetic and tactile learning styles (which are perceptual learning styles), and group learning and individual learning (social learning styles). It uses 5 point Likert scale items which ranged from 'strongly agree' to 'strongly disagree'. Reid in an email to Alkhatnai (2011) asserts that although the students in her study in 1987 answered the survey on a 1-5 scale (strongly disagree to strongly agree), she was recommended by her statistics mentor to rescale to 0-4 for ease of doing the statistical analysis (p. 241).

Reid (1987) showed that ESL students' perceptual preferences differed significantly depending on their different cultural background. For instance, students from Asia were often highly visual, with Koreans being the most visual of the other Asian students, Hispanic students (Spanish speakers of different countries) were frequently auditory, and Japanese were very non-auditory. According to her ESL learners preferred kinesthetic and tactile learning styles and indicated a negative preference for group learning style.

**Learning Style Indicator.** Although some researchers have reported a significant reliability of Reid's (1987) Perceptual Learning Style Preference Questionnaire (PLSPQ), for instance, in Cheng's (as cited in Li, 2012) pilot study the reliability of Chinese PLSPQ was 0.81 using Cronbach's alpha, Wintergerst, DeCapua, and Itzen (2001) reported on a series of validation studies of the PLSPQ that involved confirmatory factor analysis and subsequent interviews including direct and open-ended questions. The researchers found that some items in the questionnaire were not clearly measuring the learning styles that they intended to measure, and the outcomes of the PLSPQ and the following oral interviews contradicted each other on several points. Finally they found out that the internal consistency reliability raises when they omitted 6 items and grouped the remaining items under three scales: (1) Group Activity Orientation (a learner's preference of learning best when he or she works in a pair or in a group), (2) Individual Activity Orientation, which refers to a student's preference to learn on his or her own, and (3) Project Orientation, incorporating tactile, visual, and kinesthetic items. The outcome of this study was the creation of the 'Learning Style Indicator (LSI)' (Wintergerst and DeCapua, 1999).

Later, Wintergerst, DeCapua, and Verna (2003) conducted a research "on three groups of language learners: Russian EFL students, Russian ESL students and Asian (specifically Chinese, Korean, and Japanese) ESL students to determine their learning style preferences" (p. 441) and to test LSI. According to the findings of the Wintergerst *et al.*'s (2003) study, "these students learn English under three modalities: Project Orientation, Group Activity Orientation, and Individual Activity Orientation" (p. 441). Moreover, these three

groups of language learners obviously preferred group activities more than individual work, with the Russian EFL and Asian ESL students favouring group work and project work. Wintergerst *et al.*'s (2003) claim that "this instrument holds promise as a viable assessment tool for determining selected learning styles of ESL/EFL students and has sound implications for classroom teachers" (p. 441). They provided more evidence in the line with supporting the reliability and validity of this instrument.

DeCapua and Wintergerst (2005) conducted a replicate study subsequent to the previous ones in order for "obtaining consistent information within and across populations and to improve the accuracy of the instrument used" (2005, p. 4). Although as a result of doing factor analysis on the questionnaires, three statements (#5, #8, and #14), were found problematic, the remaining 20 statements fell within the three main categories and the study totally provided further support for reliability and validity of LSI (DeCapua & Wintergerst, 2005). However, the findings of the study raised various concerns with the items incorporating non-context-based nature of the statements of the questionnaire. The informants, who were students in a TESOL master's programme, remarked that they would have made different responses depending on the different learning context. DeCapua and Wintergerst suggested that "quantitative research or statistical findings alone are insufficient to ascertain the effectiveness and usefulness of a learning styles instrument, particularly in the case of non-native speakers" (2005, p. 11); therefore, "a triangular approach utilizing a questionnaire, oral interviews, and participant observations presents a fuller picture with regard to the comprehensibility of the LSI" (p. 12).

**VARK Learning Style Model.** Fleming's model, also known as VARK Learning Style, has been developed by Fleming (2001) based on perceptual dimension of learning styles and is one of the most popular instruments for measuring learning styles. VARK, as an acronym, stands for Visual, Aural, Read/write and Kinesthetic modalities of taking in and putting out the information (Fleming & Baume, 2006). According to Fleming and Baume (2006), users of the VARK complete the questionnaire online or on paper. They are allowed to have more than one answer to a question. Finally they get a profile of four scores, one for each modality. The questionnaire, in its new version, contains only 16 questions, in order to prevent respondents' (students') boredom and fatigue.

Fleming (2001) states that visual learners learn best by maps, charts, graphs, diagrams, pictures, highlighters, and different colours. Aural learners learn best by listening to information such as lectures, discussing the topics with peers and teachers, and explaining new ideas to others. They are good at retrieving things that they have heard or been told. Read/write learners prefer to take in information in the form of words incorporating essays, textbooks, readings, and taking notes. Kinesthetic learners learn best by using their hands and doing physical activities such as field trips, laboratories, and hand-on approaches. It is worth noting that Kinesthetic style in Fleming's model includes Reid's both Kinesthetic and hand-on learner. According to Fleming (2001) there are some other learners who prefer more than one preference rather than a single one. These learners are called multimodal learners.

Like other learning style theories and instruments, VARK, has also been criticized for its validity. Fleming and Baume (2006) assert that:

Dr Marilla Svinicki, Professor and Area Chair, Department of Educational Psychology (Area: Learning, Cognition and Instruction) at the University of Texas at Austin, tested VARK, and wrote:

'We found that [VARK] was hard to validate statistically, including with several modifications we tried and several statistical strategies such as multidimensional scaling. We just couldn't get a good fit with the data'.

This does not mean that the instrument itself is not valid or desirable, but it shouldn't be used in research; that is not its strength. Its strength lies in its educational value for helping people think about their learning in multiple ways and giving them options they might not have considered'. (p. 3)

**Dunn & Dunn Learning Styles Model.** Dunn and Dunn (1999) define learning style as "the way each person begins to concentrate on, process, internalize, and retain new and difficult academic information" (p. 11). Dunn (2003) claims that according to the Dunn and Dunn model, "learning style is divided into 5 major strands called *stimuli*. The stimulus strands are: a) environmental, b) emotional, c) sociological, d) psychological, and e) physiological elements that significantly influence how many individuals learn" (Dunn, 2003, p. 2). Coffield *et al.* (2004) describe this model's strands, which incorporate 21 elements, as follows:

The *environmental* strand incorporates individuals' preferences for the elements of sound, light, temperature, and furniture or seating design. The *emotional* strand focuses on students' levels of motivation, persistence, responsibility, and need for structure. The *sociological* strand addresses students' preference for learning alone, in pairs, with peers, as part of a team, with either authoritative or collegial instructors, or in varied approaches (as opposed to in patterns). The *physiological* strand examines perceptual strengths (visual, auditory, kinaesthetic or tactile), time-of-day energy levels, and the need for intake (food and drink) and mobility while learning. Finally, the *psychological* strand incorporates the information-processing elements of global versus analytic and impulsive versus reflective behaviours, but it is not measured in earlier versions of the model. (p. 21)

Coffield *et al.* (2004) list Dunn and Dunn's produced self-report instruments and remark how they differ from each other:

- The Dunn and Dunn Learning Styles Questionnaire (LSQ) (1979)
- The Dunn, Dunn and Price Learning Styles Inventory (LSI) (1992, 1996)
- The Dunn, Dunn and Price Productivity Environmental Preference Survey (PEPS) (1996)
- The Building Excellence Survey (BES) (2002)
- Our Wonderful Learning Styles (OWLS) 2002.

The LSI was refined from the first Learning Styles Questionnaire (LSQ) through factor analysis of individual items. The PEPS is an adult version of the LSI that omits

items in relation to motivation based on the need for parental or teacher approval. The BES adds items for analytic/global and impulsive/reflective processing and items that differentiate between verbal kinaesthetic and tactile kinaesthetic preferences, visual text and picture preferences. The LSI is designed for school students in US grades 3–12 (ages 9–18). It comprises 104 self-report items, with a 3-point *Likert scale* (true, uncertain, false) for students in grades 3–4 and a 5-point scale (strongly disagree, disagree, uncertain, agree, strongly agree) for students in grades 5–12. The PEPS has a Flesch-Kincaid readability level of 9–9.5 years and a 5-point Likert scale identical to that in the LSI". (p. 23)

Alkhatnai (2011) asserts that the Dunn and Dunn Modal and its instruments are used in American schools extensively and have received much attention in the literature of learning style. Nonetheless, "there have been some concerns over the Dunn and Dunn instrument's validity and reliability". Among the most obvious concerns is that "they deal with preferences as relatively fixed and constitutionally based. This may lead to labeling and generalization when using this model" (Alkhatnai, 2011, p. 52).

**Style Analysis Survey and Learning Style Survey.** The Style Analysis Survey (SAS), which was devised by Rebecca Oxford (1993), is a questionnaire with 110 items categorized under 5 parts. The first part measures the perceptual preferences of the learners and the remaining 4 parts are personality style dimensions: extraversion vs. introversion, intuitive vs. concrete/sequential, closure-oriented vs. open, global vs. analytic. In the SAS respondents answer the items on 4-point rating scales that are: 'never', 'sometimes', 'very often' and 'always'. The fact that makes this instrument important for L2 field is that the deviser of the tool, Rebecca Oxford, is an L2 expert and SAS has been used with L2 learners primarily; however, the items are not specific to ESL/EFL. In fact the items of SAS are "non-subject-specific" (Dörnyei, 2005). Later, Cohen, Oxford, and Chi (as cited in Dörnyei & Taguchi, 2010) improved the SAS and devised a new instrument called: Learning Style Survey (LSS). Learning Style Survey contains the same number of the items as SAS does (i.e. 110 items), but the categories are increased from 5 in SAS to 11 in LSS. Cohen and Weaver (2006) explain these 11 styles accompanied with names:

**Visual Vera** – Learns better by reading, seeing, observing; has difficulty with purely auditory instruction (i.e., straight lecture); tends to take copious notes; generally prefers solitary learning.

**Auditory Alex** – Loves to talk and listen; follows oral instructions easily; can have difficulty with the written word; prefers to have background noise when studying; enjoys group work.

**Handson Hal** (Kinesthetic and tactile) – Loves manipulative activities involving movement (games, making models); good gross and fine motor skills; tends to fidget and play with hands and hair; likes frequent breaks.

**Analytic Anne** – Likes to think and analyze; prefers contrastive analysis and discrimination exercises; not necessarily sensitive to social/affective factors (tends to

avoid social and emotional subtleties); often focuses on grammar rules and generalizations.

**Global Gary** – Likes to guess and consider possibilities; tends to avoid analysis; can converse without knowing all the words; sensitive to socio-emotional content.

**Extraverted Ellie** – Energized by the outside world; is active, interaction-oriented and outgoing; has broad interests; tends to reflect later (motto: “Live it, then understand it”).

**Introverted Iris** – Energized by the inner world; prefers concentration; focuses on thoughts and concepts; has fewer interests, but deep ones; likes to be reflective (motto: “Understand it, then live it”).

**Intuitive Irene** – Likes finding the big picture; looks for possibilities; would rather follow hunches and go by feel than be constrained by guidelines.

**Sequential Sam** – Likes to work in a step-by-step manner; follows directions carefully; tends to be linear and sensory-oriented.

**Closure-oriented Claudia** – Loves to make lists and follow them; wants immediate closure and control; has a low tolerance for ambiguity; often jumps to conclusions by wanting to know answers right away; tends to be hardworking and decisive; prefers to plan and manage; sees deadlines as helpful.

**Open-oriented Oliver** – Thinks learning should be fun; can make work into play; may make lists, but doesn't check off each item; tends to be flexible, spontaneous and open to change; has a high tolerance for ambiguity; sees deadlines as artificial and arbitrary.

**Impulsive Izzy** – Processes material at a high speed with low accuracy; often takes risks and guesses.

**Reflective Ralph** – Processes material at a low speed with high accuracy; avoids risks and guessing.

**Field-Independent Ian** – Able to handle the language parts as well as the whole without being distracted.

**Field-Dependent Daichi** – Needs context in order to focus and understand something; takes each language part one at a time.

**Concrete Connie** – Focuses on the here and now; does just what is asked for on a language task, no more, no less.

**Abstract Abby** – Enjoys formal model building and abstract terms; prefers linguistic analysis of languages; focuses on the future; random access (ask for 5 examples, gives 4 or 6 instead). (pp. 27-28)

Cohen and Oxford (as cited in Dörnyei & Taguchi, 2010) devised another version of the LSS simplified for using for young learners with only 51 items grouped in four categories: (1) How I use my physical senses (perceptual/sensory preferences), (2) how I

expose myself to learning situations (extroverted vs. introverted), (3) how I approach tasks (closure-oriented vs. open-oriented), and (4) how I receive information (global vs. particular) (Dörnyei , 2005; Cohen & Weaver, 2006).

**The Ehrman & Leaver's synopsis and ectasis construct.** Ehrman and Leaver (2003) developed a new instrument specifically devised to investigate the cognitive style of Language learners. In their construct polarized components of scales are generally categorized either synopsis or ectasis. “Ectasic learners prefer to learn by exerting conscious control over the learning process whereas synoptic learners prefer an unconscious approach or, as Ehrman and Leaver put it, to ‘trust their guts’” (Ellis, 2008). The whole construct is made up of 10 sub-dimensions, which many of those are similar to the ones measured in Cohen et al.’s Learning Style Survey (Dörnyei, 2005, p. 147). Ellis (2008) states that: “such an approach to investigating cognitive style is promising” (p. 666). See Dörnyei (2005) for details on subdimensions of Ehrman and Leaver’s (2003) construct.

Ehrman and Leaver developed a questionnaire called “the Learning Style Questionnaire” by which they measure the distinctions between ten subscales. This instrument contains 30 items using a 9- point semantic differential bipolar scale format.

### III. CONCLUSION

Learning styles have been conceptualized differently by scholars and researchers. Based on these conceptualizations, some of the variables such as cognitive styles and personality traits have been categorized as dimensions of learning styles by some scholars whereas some other researchers consider them as totally independent variables. These different and sometimes contradictory conceptualizations have also been mirrored in measurement tools and research findings as well. Various instruments have been devised to measure the learning styles in L2 field as well as in general education based upon different constructions.

Some studies also have reported that the instrument to measure the styles lack sufficient validity and reliability. For instance, reliability and validity of Reid’s PLSPQ, which is one of the most widely used instruments for measuring learning styles, has been questioned through the study conducted by Wintergerst *et al* (2003).

To eliminate the conceptual ambiguity of the learning styles, the authors of the current paper define learning styles as a wide range of interrelated variables concerned with the ways individuals learn or prefer to learn new information, and variables which affect the learning and cognitive development of the learners’ including various dimensions such as: perceptual, cognitive, personality, motivational, strategic, and environmental learning styles. In this definition, in other words, the term “learning styles” is an umbrella term which includes various subgroups such as perceptual learning styles, cognitive learning styles, personality learning styles, and strategic learning styles (learning strategies) which have been defined and discussed in the literature. Therefore, every researcher who aims to investigate learning styles should initially decide which dimension or dimensions of learning styles (s)he is going to probe, and what instrument (if any) properly measures the intended dimensions.

## REFERENCES

- Alkhatnai, M. (2011). Learning styles of EFL Saudi college-level students in on-line and traditional educational environments. (Doctoral dissertation, Indiana University of Pennsylvania). Retrieved from <http://dspace.iup.edu/bitstream/handle/2069/341/Mubarak%20Alkhatnai.pdf?sequence=1>
- Cassidy, S. (2004). Learning styles: An overview of theories, models, and measures. *Educational Psychology*, 24(4), 419-444.
- Chapelle, C., & Green, P. (1992). Field Independence/Dependence in Second-Language Acquisition Research. *Language Learning*, 42(1), 47-83.
- Cohen, A. D., & Weaver, S. J. (2006). *Styles-and strategies-based instruction: A teachers' guide*. Foreign Language Teaching and Research Press.
- Coffield, F., Moseley, D., Hall, E., & Ecclestone, K. (2004). Learning styles and pedagogy in post-16 learning: A systematic and critical review. Retrieved from: <http://lerenleren.nu/bronnen/Learning%20styles%20by%20Coffield%20e.a.pdf>
- Curry, L. (1983). *An organization of learning styles theory and construct*. Paper present at the annual meeting of the American Educational Research Association, Montreal, Canada. (ERIC Document Reproduction Service No. ED235185)
- DeCapua, A., & Wintergerst, A. C. (2005). Assessing and validating a learning styles instrument. *System*, 33(1), 1-16.
- Demirkol, T. (2009). *An investigation of Turkish preparatory class students listening comprehension problems and perceptual learning styles* (Master's thesis, Bilkent University, Ankara, Turkey). Retrieved from <http://www.thesis.bilkent.edu.tr/0006191.pdf>
- Dörnyei, Z. (2005). *The psychology of the language learner: Individual differences in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum.
- Dörnyei, Z., & Taguchi, T. (2010). *Questionnaires in second language research: Construction, administration, and processing*. Routledge.
- Dunn R (2003). The Dunn and Dunn learning style model and its theoretical cornerstone. In R Dunn and S Griggs (Eds), *Synthesis of the Dunn and Dunn learning styles model research: who, what, when, where and so what – the Dunn and Dunn learning styles model and its theoretical cornerstone*, (pp. 1–6). New York: St John's University.
- Dunn, R., Beaudry, J. S., & Klavas, A. (1989). Survey of Research on Learning Styles. Retrieved from [http://www.ascd.org/ASCD/pdf/journals/ed\\_lead/el\\_198903\\_dunn.pdf](http://www.ascd.org/ASCD/pdf/journals/ed_lead/el_198903_dunn.pdf)
- Dunn, R., & Dunn, K. (1999). *The complete guide to the learning styles in-service system*. Boston: Allyn & Bacon.
- Dunn, R., Dunn, K. & Price, G.E. (1991). *Productivity Environmental Preference Survey*. Price System, Lawrence, KS.

- Ehrman, M. E. (1996). *Understanding second language difficulties*. Thousand Oaks, CA: Sage.
- Ehrman, M. E., & Leaver, B. L. (2003). Cognitive styles in the service of language learning. *System, 31*, 391–415.
- Ellis, R. (2008). *The study of second language acquisition* (2nd ed.). Oxford: Oxford University Press.
- Felder, R. M., & Henriques, E. R. (1995). Learning and teaching styles in foreign and second language teaching. *Foreign Language Annals, 28*(1), 21-31.
- Fleming, N.D. (2001). Teaching and learning styles: VARK strategies. Christchurch, New Zealand: N.D. Fleming.
- Fleming, N., & Baume, D. (2006). Learning Styles Again: VARKing up the right tree! *Educational Developments, 7*(4), 4-7.
- Griffiths, R., & Sheen, R. (1992). Disembedded Figures in the Landscape: A Reappraisal of L2 Research on Field Dependence/Independence. *Applied Linguistics, 13*(2), 133-148
- Huseynpur, B., Moghaddam, M. Y., & Rezaie, G. (2015). The relationship of EFL learners' socio-economic status with their learning styles. *International Journal of Educational Investigations, 2*(1), 44-57.
- Keefe, J. W. (1979). Learning style: An overview. In J. W. Keefe (Eds), *Student learning styles: Diagnosing and prescribing programs* (pp.1-17). Reston, VA: National Association of Secondary School Principals.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development* (Vol. 1). Englewood Cliffs, NJ: Prentice-Hall.
- Li, C. (2012). An investigation of Chinese students' learning styles at an English-medium university in Mainland China. *Theory and Practice in Language Studies, 2*(1), 06-13.
- Oxford, R. L. (1993). *Style Analysis Survey (SAS)*. Tuscaloosa: University of Alabama.
- Oxford, R. (2001). Language learning styles and strategies. In M. Celce-Murcia (Eds), *Teaching English as a second or foreign language* (3rd ed., pp. 359-366). Boston: Heinle & Heinle.
- Oxford, R.L. (2003). Language learning styles and strategies: an overview. *Learning Styles & Strategies/Oxford, GALA, 1*–25.
- Oxford, R. L., & Anderson, N. J. (1995). A cross-cultural view of learning styles. *Language teaching, 28*(04), 201-215.
- Reid, J., M., (1987). The Learning Style Preferences of ESL Students. *TESOL Quarterly, 21*(1), 87-111.
- Reid, J.M. (1995). *Learning styles in the ESL/EFL classroom*. Boston: Heinle & Heinle.
- Reid, J. M. (1998). Preface. In J. Reid (Eds), *Understanding learning styles in the second language classroom*. (pp. ix- xiv). USA: Prentice Hall Regents.

- Scarella, R. C., & Oxford, R. L. (1992). *The tapestry of language learning: The individual in the communicative classroom* (p. 63). Boston, MA: Heinle & Heinle.
- Skehan, P. (1998). *A cognitive approach to language learning*. Oxford: Oxford University Press.
- Sprenger, M. (2008). *Differentiation through learning styles and memory*. California: Corwin Press.
- Sternberg, R. J., & Grigorenko, E. L. (2001). A capsule history of theory and research on styles. In R. J. Sternberg & L.-F. Zhang (Eds.), *Perspectives on thinking, learning, and cognitive styles* (pp. 1–21). Mahwah, NJ: Lawrence Erlbaum Associates.
- Tabanlioğlu, S. (2003). *The relationship between learning styles and language learning strategies of pre-intermediate EAP students* (Master's thesis, Middle Est Technical University, Ankara, Turkey). Retrieved from [http://etd.lib.metu.edu.tr/upload/1014034/index.pdf?origin=publication\\_detail](http://etd.lib.metu.edu.tr/upload/1014034/index.pdf?origin=publication_detail)
- Vaseghi, R., Ramezani, A. E., & Gholami, R. (2012). Language Learning Style Preferences: A Theoretical and Empirical Study. *Advances in Asian Social Science*, 2(2), 441-451.
- Willing, K. (1987). *Learning Styles in Adult Migrant Education*. Adelaide: Adult Migrant Education Programme.
- Wintergerst, A., DeCapua, A. (1999). Learning Styles Indicator (LSI). Copyrighted by Wintergerst and DeCapua. Available through Ann Wintergerst, Department of Languages and Literatures, St. John's University, Queens, New York 11439.
- Wintergerst, A. C., DeCapua, A., & Itzen, R. C. (2001). The construct validity of one learning styles instrument. *System*, 29, 385–403.
- Wintergerst, A. C., DeCapua, A., & Verna, M. A. (2003). Conceptualizing learning style modalities for ESL/EFL students. *System*, 31, 85–106.