Comparing strategy use of dyslectic and non-dyslectic Greek EFL learners: The effect of gender, educational level, self-perceived proficiency, and motivation

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Abstract

Previous studies have shown that the role of learning strategies (LS) is pivotal in foreign language learning. Nevertheless, many other factors affect the use of LS. More specifically, gender, educational level/age, language proficiency, along with motivation influence the use of LS. Our knowledge about the use of LS by dyslectic learner is limited and it rather focuses on the role of motivation of this group. The purpose of the present study is to extend our knowledge on underexamined factors (i.e. gender, educational level, self-perceived proficiency and motivation) that may drive the use of LS of (non-)dyslectic foreign language learners. To this end, 129 EFL (9-15 years old) were tested (55 dyslectic learners and 74 non-dyslectic learners). LS were tested by means of a questionnaire (translated and adapted Greek version of the SILL; cf. Oxford, 1990). The results revealed that a medium strategy use was found in all learners, regardless of their group. Nevertheless, non-dyslectic learners used significantly more and more efficient strategies than dyslectic learners. Gender and educational level did not seem to affect LS use. By contrast, self-rated proficiency and motivation affect the successful use of LS. The findings are also discussed in light of implications for classroom practices.

Keywords: learning strategies; dyslexia; educational level; self-rated proficiency; motivation

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1. Introduction

Language learning is a complex process facilitated and enhanced by the combined use of Language Learning Strategies (LLS) in various learning situations. Research on LLS is of paramount importance in Foreign Language (FL) learning. LLS entail specific actions, conscious behaviors, steps or techniques that learners use to store and retrieve information (Dörnyei, 2005; Oxford, 2011), to gain knowledge (Rubin, 1975) or to achieve a learning or communicative goal (Cohen et al., 1996; Chamot, 2005; Griffiths, 2007; Gavriilidou & Petrogiannis, 2016a; Gavriilidou et al., 2017; Gavriilidou & Mitits, 2020). According to Chamot (2005, p. 14) "Strategic learners have metacognitive knowledge about their own thinking and learning approaches, a good understanding of what a task entails, and the ability to orchestrate the strategies that best meet both the task demands and their own learning strengths". More specifically, previous studies have shown that more successful language learners are aware of the strategies they use (Kaylani, 1996; Lan & Oxford, 2003; Magogwe & Oliver, 2007) and they can choose the most appropriate strategy or a set of strategies for each task demonstrating "metacognitive task knowledge" (Chamot & El-Dinary, 1999; Oxford et al., 2004), while less successful learners don't know how to effectively select the appropriate strategy (Green & Oxford, 1995). Despite prolific research on LLS employed by typical population in order to raise learners' awareness in strategy use and on specific (mainly decoding) strategies used by dyslexic adults (Kirby et al., 2008), almost no attention has been paid to the overall strategic profile of dyslectic people and whether this differentiates from typical population. It is important that learners with dyslexia are also trained in strategy use, so that they can be able to apply the widest range of strategies for facilitating foreign language learning, given that one of the objectives of the EU's language policy is that every European citizen should master two other languages in addition to their mother tongue. However, profiling should precede training.

Developmental Dyslexia, on the other hand, is the most common specific learning difficulty. Individuals with dyslexia, despite their normal intelligence, face difficulties with phonological decoding and awareness, acquisition of vocabulary and complex syntax, along with problems in reading and writing (Fletcher et al., 2007). Their poor cognitive abilities may also lead to their deprived linguistic abilities and language skills. Some researchers have also linked this deficit to language processing difficulty which persists in dyslexia; in other words, weakness in decoding, encoding, phonological awareness, syntax, word storage and retrieval arise from processing difficulties (Mody, 2003). Even though, some of their discrepancies may decrease with age and experience, most individuals continue to experience significant reading and writing-related problems throughout their adult lives. These problems are transferred to any other language the individual learns. According to Arries (1999), the abilities and skills that dyslectic learners are weak in their first language (L1) are those which are also required in FL learning. In a similar vein, Skehan (1991) claimed that learners who develop slower within their L1, such as dyslectic learners, will have problems when learning a FL.

Furthermore, motivation is a very important component of language learning (Dörnyei, 2005). Dyslectic learners often feel demotivated due to the difficulties they encounter during the learning process (Kormos & Kontra, 2008). They also feel anxiety and such affective factors have a negative impact on their self-confidence (Sparks & Ganschow, 1991; Crombie, 1999). Nevertheless, some studies note that dyslectic learners also exhibit motivation; however, their motivation differs from that of their non-dyslectic peers.

Apart from motivation, teaching is also important. Many studies have noted that the way in which FL is commonly taught is problematic (Kormos et al., 2009), since language teachers are not trained properly in how to teach FL to learners with learning disorders (Smith, 2008; Kormos et al., 2009). In the study of Kormos and colleagues (2009), negative teacher behavior along with inappropriate teaching methods hamper learners'

self-esteem, provoke anxiety and cause negative attitudes to language learning and, thus, they hinder motivation. By contrast, positive teacher attitudes and appropriate teaching methods (e.g. multi-sensory methods) and the promotion of LLS boost FL learning and dyslectic learners' motivation (Kormos & Kontra, 2008; Kormos et al., 2009). Tralli and colleagues (1996) suggest that learners with learning difficulties have to be trained to learning strategies and this training should have an increasing difficulty, starting from the simplest strategies and moving to the most complex ones.

Thus, the purpose of the present paper is to extend the restricted literature on LLS use by dyslectic learners by comparing LLS use of dyslectic and non-dyslectic learners aged 9-15 years old that attend Greek schools and investigate the effect of gender, educational level, self-perceived proficiency and motivation with respect to their strategy use.

2.   Literature review

2.1 Dyslexia and discrepancies in first and foreign language

Developmental Dyslexia is a specific learning difficulty with a neurobiological origin. Many difficulties are linked to dyslexia and have an impact on L1 acquisition the acquisition of L1 and FL learning. All these discrepancies are not expected considering the chronological age of the individual and their intelligence, socioeconomic status and education (Ramus, 2003). Some of the issues are associated with decoding and encoding abilities; more specifically, word recognition and spelling are negatively affected. The aforementioned deficits emerge from a deficit in the phonological ability (Fletcher et al., 2007). Continuing this line of reasoning, difficulties are often detected in reading comprehension and in reduced reading experience that may hamper growth of vocabulary and background knowledge (Lyon et al., 2003). Dyslexia may also have a negative impact on writing skills (Berninger et al., 2008). Apart from vocabulary acquisition, syntax is also affected; hence, both comprehension and production of complex structures are demanding for dyslectic individuals (Crombie, 1997).

Along with linguistic problems, issues are detected in cognitive abilities, such as working memory, executive functions (Helland & Asbjørnsen, 2000; Swanson, 2000; Smith-Spark et al., 2003) and attention (Roodenrys et al., 2001). These abilities seem to be of paramount importance for vocabulary growth (Baddeley et al., 1998) and for an overall successful learning process (Jeffries & Everatt, 2004).

Similar, or even more serious, problems are detected in FL learning (Crombie, 1997). A factor that is of decisive importance is the language transparency (Ziegler & Goswami, 2005; Kormos & Smith, 2012). Thus, languages, in which graphemes and phonemes correspond almost one-to-one to each other (e.g., Italian, Spanish), are less demanding for the dyslectic learners (Csizér et al., 2010). English is a non-transparent language, as there are 26 graphemes but 44 phonemes meaning that one grapheme may correspond to different phonemes (Linan-Thompson, 2014). This absence of transparency leads to difficulties in both reading and writing in terms of accuracy and fluency. In addition, due to their poor cognitive abilities dyslexic learners struggle with remembering words and information of the text while reading, which hampers language comprehension and vocabulary acquisition (Service, 1992; Hulstijn, 1997; Jeffries & Everatt, 2004). Some studies have reported that learners with dyslexia read words erroneously (Sarkadi, 2008). For instance, they may read "water" as "weather" or "waiter". This discrepancy often leads to a wrong mapping and subsequently storage of the written word with its oral representation in the mental lexicon resulting in deviant vocabulary acquisition.

Apart from the problematic acquisition of vocabulary, syntax is also demanding (Kormos & Smith, 2012). Previous studies have shown that FL learners with dyslexia have also difficulties with syntax (i.e. complex structures, such as negations and passive voice; see Kormos & Mikó, 2010, Kormos & Smith, 2012). Due to these problems their writing skills are also affected. They also face issues with spelling and punctuation (Ndlovu & Geva, 2008) and they have difficulties with planning an appropriate text structure (Kormos & Smith, 2012). Therefore, their poor linguistic and cognitive abilities together with their deviant reading and writing skills result

in low self-esteem in both L1 and FL learning (Riddick et al., 1999) and subsequently have an impact on their motivation and their learning strategies (Csizér et al., 2010).

2.2 Language learning strategy use

The use of LLS in typical population is affected by various factors, such as gender (Ehrman & Oxford, 1989; Oxford & Nyikos, 1989; Nyikos, 1990; Green & Oxford, 1995; Kaylani, 1996; Mochizuki, 1999; Lan & Oxford, 2003; Lee, 2003), educational level of the learner (Oxford & Nyikos, 1989), proficiency (O'Malley & Chamo, 1990; Green & Oxford, 1995; Chamot & El-Dinar, 1999; Anderson, 2005) and motivation (Oxford & Nyikos, 1989; MacIntyre & Noels, 1996; Wharton, 2000; Mitits & Gavriilidou, 2014).

Furthermore, previous research on LLS (Oxford et al., 1989; Chang, 1990; Green, 1991; Oxford & Burry-Stock, 1995; Gavriilidou et al., 2020) reported medium frequencies of use for the majority of strategy categories used by typical population. Up to date there is no data regarding on frequency of LLS use of learners with dyslexia nor on how various variables affect strategy use in this population.

2.3 Factors affecting LLS use

Gender - There is a vast majority of research on LLS and gender with diverse results. Although most of the studies indicated that females use more strategies than males (Green & Oxford, 1995; Mitits, 2014), some studies reported the opposite finding (Wharton, 2000; Tercanlioglu, 2004), while other researchers did not find gender differences in the use of LLS (Griffiths, 2003; Psaltou-Joycey, 2008; Gavriilidou & Papanis, 2010). Interestingly, El-Dib (2004) noted that gender differences are not found in the quantity but in the quality of LLS use. In other words, both females and males use LLS, but the type of the strategies they use differs. Continuing this line of reasoning, in one of her studies Mitits (2014) found that females used more cognitive, compensation, metacognitive, affective and social categories than males, while, no gender differences were attested in the use of memory strategies. Moreover, Vrettou (2009, 2011) documented that females outperformed males in the use of different strategies (i.e. cognitive, metacognitive, affective and social) suggesting that these differences are due to the biological, affective and social maturity of girls. The different findings regarding gender may result from the interaction of various factors, such as age and educational level.

Educational level/age - Educational level, related to learner's age, is an important factor, which is involved in the use of LLS. Previous studies in typically developing FL learners have shown that educational level and age affect the use of strategies (Gavriilidou & Petrogiannis, 2016a, 2017). Gavriilidou & Petrogiannis (2016a) found that compared with learners attending secondary schools in Greece, learners of elementary schools demonstrated higher mean scores in all six types of language learning strategy. In the same vein, other researchers reported statistically significant differences, in favor of the younger learners, in all LLS categories, apart from compensation strategies (Psaltou-Joycey & Sougari, 2010). Another important remark is that older and more advanced learners use more sophisticated strategies (Bialystok, 1981; Ellis, 1997; Peacock & Ho, 2003; Gavriilidou & Psaltou-Joycey, 2009). Previous studies indicated that upper elementary learners used more affective, compensation (Gunning, 2011) and social strategies (Magogwe & Oliver, 2007). The findings of Gavriilidou (2004) suggested that bilingual elementary school learners use metacognitive and cognitive strategies, while the use of socio-affective strategies decreases with age. The outcomes of Gavriilidou & Petrogiannis (2017) indicated that upper elementary and junior secondary learners use more metacognitive strategies while they rarely use cognitive strategies. By contrast, in a study of Mitits and colleagues (2016) junior secondary learners seemed to use more affective strategies, followed by metacognitive ones. These seemingly contradictory findings can be explained if we consider age in relation to other variables, such as language proficiency level (Psaltou-Joycey, 2010; Gavriilidou & Petrogiannis, 2016a).

Language proficiency level - Language proficiency level seems to correlate with the use of strategies. Various methods have been used to measure language proficiency in the FL; for instance, some studies use the

self-rating method (Oxford & Nyikos, 1989; Wharton, 2000), while others use the course level/years of learning a language (Green & Oxford, 1995; Griffiths, 2003) or the time spent in the country where the FL is spoken (Purdie & Oliver, 1999). In addition, some studies use placement tests (Mullins, 1992; Chou, 2002) or standardized proficiency and achievement tests (Green & Oxford, 1995; Griffiths, 2003). Research has shown that language proficiency positively correlates with the variety and number of strategies used (Green & Oxford, 1995; Chamot & El-Dinary, 1999; Wharton, 2000). Wharton's study (2000) investigated the relationship between strategy use and self-rated proficiency of bilingual university learners. The results suggested that highly proficient learners used strategies more frequently. Moreover, other studies have shown that more proficient learners use more successful strategies (Psaltou-Joycey, 2010). According to Gavriilidou and Papanis (2010), language proficiency positively affects the use of metacognitive strategies.

Motivation - As put by Gardner and Masgoret (2003, p. 128), "the motivated individual expends effort, is persistent and attentive to the task at hand, has goals, desires, and aspirations, enjoys the activity, experiences reinforcement from success and disappointment from failure, makes attributions concerning success and/or failure, is aroused, and makes use of strategies to aid in achieving goals. That is, the motivated individual exhibits many behaviors, feelings, cognitions, etc. that the individual who is unmotivated does not". Motivation can be either intrinsic (related to inner motives) or extrinsic (related to others' motives) and integrative (learners' positive attitudes or beliefs about the language and the culture) or instrumental (school or career achievement) (Gardner, 2000). According to Gardner (2000), integrative motivation is important for successful language learning. In the same vein, Ellis (1997) suggested that integrative motivation is more important in formal learning than instrumental motivation. From the above we understand that motivation is an important factor for FL learning and previous studies have shown that motivation correlated with the use of LLS; thus, highly motivated learners exhibit a variety of strategies more often than less motivated learners (Wharton, 2000; Dörnyei, 2005; Sarafianou & Gavriilidou, 2015; Gavriilidou et al., 2020). In a study of Schmidt and Watanabe (2001) highly motivated learners used more cognitive and metacognitive strategies than less motivated learners. Mitits (2014) indicated that more motivated learners employed more strategies with the sole exception of compensation strategies, which were equally used regardless of the learners' level of motivation. In addition, motivation affects the frequency of LLS use; hence, more motivated learners used more frequently LLS (Vrettou, 2009). Mitits et al. (2020) found that multilinguals attending mainstream schools have different motivational orientations than minority school learners, however, both groups were equally motivated and demonstrated mainly instrumental motivation. In a series of studies (Hong-Nam, 2006; Hong-Nam & Leavell, 2007) monolingual and bilingual FL learners of English the results exhibited that both groups had instrumental motivation for learning English. However, the bilinguals found formal learning more important. In a study of Purdie and Oliver (1999) self-efficacy beliefs or learner attitudes have a significant relation to the use of strategies. Moreover, learners with integrative motivation used more cognitive and metacognitive strategies.

2.4 LLS and motivation in Dyslexia

Apart from typical populations, LLS have been found to be positively associated with academic achievement for learners with learning difficulties (Tralli et al., 1996; Ruban et al., 2003; Trainin & Swanson, 2005; Kirby et al., 2008; Chevalier et al., 2015). Research on strategies used by learners with learning difficulties is scarce and most of the studies examine university learners and not young learners with dyslexia. Their findings suggest that learners with learning difficulties do not employ efficient strategies in order to learn a FL and they must be trained explicitly in the use of successful strategies (Tralli et al., 1996). Since their cognitive skills are deviant, dyslectic learners do not use cognitive strategies. With age and teaching, they learn to use metacognitive strategies and thus they, sometimes, exhibit a comparable performance to their peers (Ruban et al., 2003; Trainin & Swanson, 2005; Kirby et al., 2008; Chevalier et al., 2015).

Many studies have depicted that dyslectic learners often feel deprived and lose their motivation to learn a FL (Kormos & Kontra, 2008), feel anxiety (Sparks & Ganschow, 1991), and have low self-esteem (Crombie, 1999). Previous studies have indicated that both dyslectic and non-dyslectic learners are motivated, albeit in a different

way (Sparks et al., 2008). Thus, most of the dyslectic learners show more extrinsic motivation, in other words they have external instrumental goals (i.e. to pass the exams, to get better jobs), while their non-dyslectic peers demonstrate more intrinsic motivation, which is affected by internal affective factors (Williams & Burden, 1997; Csizér et al., 2010). Moreover, dyslectic learners tend to lose their intrinsic motivation (i.e. factors regarding interest, value, locus of control, attitudes, and other affective factors) due to the difficulties they experience in FL learning (Williams & Burden, 1997; Csizér et al., 2010). According to Csizér and colleagues (2010) intrinsic interest emerges when these learners learn a transparent language. Nonetheless, the same study depicts that all learners, both dyslectic and non-dyslectic, have reported that they prefer to learn English, because it is a lingua franca. From the above, we understand that learning English as a FL is necessary.

Strategies and motivation in FL learners with dyslexia are under-investigated and the existing research investigates mostly dyslexic adults and not younger learners. In addition, to date, the research is also scarce regarding factors such as gender, educational level, motivation and self-perceived proficiency of dyslectic learners.

2.5 Aims and hypotheses

The present study aims to address gaps in previous literature on LLSs by:

➢ comparing overall and by category LLS use of dyslectic and non-dyslectic Greek-speaking learners, aged 9-15 years old, who learn English as a foreign language,

➢ investigating the effect of gender, educational level, self-perceived proficiency and motivation to overall strategy use by dyslectic and non-dyslectic learners and

➢ investigating the effect of gender, educational level, self-perceived proficiency and motivation to separate strategy category use by dyslectic and non-dyslectic learners.

Consistently with the literature on LLS use by people with and without dyslexia (Tralli et al., 1996; Ruban et al., 2003; Trainin & Swanson, 2005; Kirby et al., 2008, Chevalier et al., 2015; Gavriilidou & Petrogiannis, 2016a; Gavriilidou et al., 2020; Mitits et al., 2020;) we expected medium strategy use by the non-dyslectic sample and low use of LLS by learners with dyslexia comparing to learners without dyslexia and a statistically significant overall strategy use by the control group.

Based on previous literature we also expected girls to outperform boys (Green & Oxford, 1995; Vrettou, 2009, 2011; Mitits, 2014), junior secondary learners to use more and more advanced strategies, such as metacognitive strategies (Bialystok, 1981; Ellis, 1997; Peacock & Ho, 2003; Gavriilidou & Psaltou-Joycey, 2009), learners reporting higher proficiency to demonstrate better scores than their peers who reported a lower proficiency (Oxford & Nyikos, 1989; Wharton, 2000; Gavriilidou et al., 2020) and finally the more motivated learners to outperform the less motivated ones (Ellis, 1997; Gardner, 2000; Csizér et al., 2010).

3. Material and methods

3.1 Participants

The sample consisted of 129 subjects aged 9-15 years old (M=12,21, SD=+/-1.74). Participants were divided into two groups, the Experimental Group (E.G.), which consisted of 55 dyslectic learners and the Control Group (C.G.) which consisted of 74 non-dyslectic learners. All the dyslectic participants were officially diagnosed with dyslexia and it was confirmed that participants had low word reading ability in spite of typical mental ability. Both Control and Experimental Groups are sub-samples of a larger project which were selected through stratified sampling in the frame of Thales Project (MIS 379335) (Karousou et al., 2017). The two groups were matched on age, geographical origin (which could potentially reflect different socio-economical

characteristics) and their gender and included 32 boys and 23 girls in the Experimental Group and 37 boys and 37 girls in the Control Group.

Written informed consent was obtained beforehand from parents/ guardians/ legally authorized representatives of minors included in the study (cf. also the section, *Compliance with Ethical Standards*).

3.2 Instrumentation and procedure

The main instrument used in the study was the translated and culturally adapted Greek version of the SILL (Oxford, 1990) which was validated for Greek school typical population (Petrogiannis & Gavriilidou, 2015) in the frame of Thales Project (MIS 379335). Karousou et al. (2017) discuss in detail the conditions under which SILL achieved the intended objectives of reliability and validity for the Greek setting.

This 5-point Likert-type scale instrument asks learners to report the frequency with which they use certain language learning strategies. The instrument had three parts. Part A consisted of 29 items designed to capture the learners' strategy use for FL learning. The items are organized under six factors:

➢ memory strategies (remembering and retrieving vocabulary), i.e. how learners remember and retain language (4 items),

➢ cognitive strategies (comprehending and producing text), which indicate how learners process information more deeply while learning (6 items),

➢ compensation strategies (compensating for the lack of knowledge), reflecting how learners make up the limited language to achieve successful language use (4 items).

➢ metacognitive strategies (manipulating learning processes), i.e. how they manage their own learning (7 items),

➢ affective strategies (regulating affective state), i.e. how learners adjust their affective status in the learning process (3 items),

➢ social strategies (learning with others) which refer to how learners learn language through social interaction (6 items).

Part B and C included questions concerning demographic information, learner's perceived proficiency level in relation to their classmates (5-point scale, from low to very good), their motivation to learn Greek in terms of the perceived importance of the language (3-point, not so important to very important) and their reasons for learning the language (16 items and an open question). Learners' motivation and self-perceived proficiency were calculated based on the participants' respective answers in parts C and B.

To check the reliability of the instrument and its sub-scales a Cronbach's Alpha coefficient was calculated. Cronbach's Alpha coefficient for the overall instrument was .78 suggesting a good degree of internal consistency. The value of the Alpha coefficient a) for memory strategies was .56; b) for cognitive strategies was .71; c) for compensation strategies .43; d) for metacognitive strategies .83; for affective strategies .52; and for social strategies .70. Respondents received instructions to fill in the 29-item SILL and the background questionnaire in their classrooms after permission granted by the central and local educational authorities. Non-dyslectic learners filled in the questionnaire during class hour in a self- report format. For dyslexic participants, individual sessions were organized, and for them the questionnaire was read aloud in order to accommodate their reading difficulties.

3.3 Statistics

Kolmogorov-Smirnov normality test indicated a normal distribution for all the variables taken into

consideration. While, four two-way Analyses of Variance (ANOVA) were conducted to check the effect of group (dyslectic vs. non-dyslectic) and a) gender, b) educational level, c) self-perceived proficiency, and d) motivation on overall strategy use. Four multivariate analyses of variance (MANOVA) were conducted to check the effect of group (dyslectic vs. non-dyslectic) and a) gender, b) educational level, c) self-perceived proficiency, and d) motivation on different types of strategies (memory, metacognitive, cognitive, affective, social). Bonferroni post hoc multiple comparison tests were conducted in the ANOVAs and MANOVAs to check "Within-variable" differences when needed. All analyses were run in SPSS (version 25.0).

For the ease of the analysis and in consonance with Oxford (1990), the five original ratings were collapsed into three categories, with a mean score over 3.5 on all the SILL items indicating "high use of a given strategy, 2.5-3.4 indicating "medium use" and below 2.4 indicating "low use" of a strategy. To calculate the cut-off of each category, the median, i.e. the number that was exactly in the middle of the data, at the same distance from the highest and lowest value in the dataset was calculated according to the formula: (highest point in Likert scale − lowest point in Likert scale)/the number of the levels used. We also confirmed that the cut-off points of 2.5 and 3.5 are very close to the empirical first and third quartiles of the data for each LLS respectively.

4. Results

4.1 Comparison of LLS use according to group

Table 1 displays data form the analyses that follow. As seen in Table 1, the control group uses significantly more overall strategies than the experimental group and make a significantly higher use of all types of strategies except for compensation strategies. The mean frequency of overall use of both groups reflects a' medium use' of strategies, while the control group manifests 'high use' only for metacognitive strategies and a 'medium use' for all the other types of strategies. On the other hand, the experimental group manifests medium use for all types of strategies except for cognitive strategies which fall within the range of 'low use'. The higher mean for the control group is found in metacognitive strategies, and for the experimental one in compensation strategies.

Table 1

Means (SDs) according to group

Language Learning Strategies (LLS)	Group	
	Experimental Group Mean (SD)	Control Group Mean (SD)
Memory	2.81 (.72)	3.18 (.77)*
Cognitive	2.46 (.65)	3.11 (.69)***
Compensation	2.98 (.90)	3.24 (.94)
Metacognitive	2.92 (.94)	3.56 (.73)***
Affective	2.82 (.81)	3.35 (.91)**
Social	2.58 (.87)	3.19 (.85)***
TOTAL	2.77 (.48)	3.27 (.59)***

Note. *p<.01, **p<.005, and ***p<.001.

4.2 The effect of gender, educational level, self-perceived proficiency, and motivation to overall strategy use by dyslectic and non-dyslectic learners

The first two-way ANOVA, with "gender" and "group" as independent variables and "overall strategy use" as dependent showed no statistically significant interaction effect between "gender" and "group" on "overall strategy use" (F (1, 129) = .305, p = .582, η^2 =.002) nor a main effect of "gender" (F (1, 129) = 1.879, p = .173, η^2 = .015). A statistically significant main effect of "group" was found (F (1, 129) = 25.826, p < .001, η^2 = .171), with non-dyslectic learners demonstrating higher scores than their dyslectic peers.

The second two-way ANOVA, with "educational level" and "group" as independent variables and "overall strategy use" as dependent showed no statistically significant interaction effect between educational level and group on overall strategy use (F (5, 129) = .772, p = .572, η^2 = .032) nor a main effect of educational level (F (5, 129) = 1.063, p = .385, η^2 =.043). A statistically significant main effect of group was found (F (1, 129) = 25.464, p < .001, η^2 = .179), with non-dyslectic learners demonstrating higher scores that their dyslectic peers.

The third two-way ANOVA, with "self-rated proficiency" and "group" as independent variables and "overall strategy use" as dependent showed no statistically significant interaction effect between "self-rated proficiency" and "group" on "overall strategy use" (F (4, 127) = .173, p = .952, η^2 = .006). A statistically significant main effect of "proficiency" (F (4, 127) = 5.251, p < .005, η^2 = .152) was found. Post hoc analyses Bonferroni showed statistically significant differences between learners with high (p = .012) and very high (p < .001) self-perceived proficiency compared with those with low proficiency. Finally, a statistically significant main effect of "group" was found (F (1, 127) = 5.492, p = .021, η^2 = .045), with non-dyslectic learners demonstrating higher scores than their dyslectic peers.

The results of the fourth two-way ANOVA, with "motivation" and "group" as independent variables and "overall strategy use" as dependent showed no statistically significant interaction effect between "motivation" and group on "overall strategy use" (F (2, 129) = 2.053, p = .133, η^2 =.032). A main effect of "motivation" (F (2, 129) = 9.863, p < .001, η^2 = .138) was found. Post hoc analyses Bonferroni showed statistically significant differences between very highly and less-motivated learners (p = .002) and between highly and less motivated learners (p = .003). Furthermore, a statistically significant main effect of "group" was found (F (1, 129) = 6.023, p = .016, η^2 = .047), with non-dyslectic learners demonstrating higher scores than their dyslectic peers.

4.3 The effect of gender, educational level, self-perceived proficiency, and motivation to use of each strategy category by dyslectic and non-dyslectic learners

The results of the first MANOVA, with two independent variables, "group" (dyslectic vs. non-dyslectic) and "gender", and five dependent variables, ("memory", "metacognitive", "cognitive", "affective", "social"), indicated no statistically significant interaction effect between "group" and "gender" on the combined dependent variables (F (6, 120) = .354, p = .906, η^2 = .017), nor a main effect of "gender" (F (6, 120) = 1.550, p = .168, η^2 = .072). On the contrary, a statistically significant main effect of "group" was found (F (6, 120) = 5.068, p < .001, η^2 = .202). Post hoc test Bonferroni revealed that non-dyslectic learners had significantly better scores than their dyslectic peers in memory (p = .008), cognitive (p < .001), metacognitive (p < .001), affective (p = .001), and social strategies (p <.001).

The results of the second MANOVA, with two independent variables, "group" (dyslectic vs. non-dyslectic) and "educational level", and five dependent variables, ("memory", "metacognitive", "cognitive", "affective", "social"), indicated no statistically significant interaction effect between "group" and "educational level" on the combined dependent variables (F (5, 129) = 1.001, p = .466, η^2 = .049), nor a main effect of "educational level" (F (5, 129) = .870, p = .668, $\eta2$ = .043). On the contrary, a statistically significant main effect of "group" was found (F (1, 129) = 4.755, p < .001, η^2 = .203). Post hoc test Bonferroni revealed that non-dyslectic learners had significantly better scores than their dyslectic peers in "memory" (p = .011), "cognitive" (p < .001), "metacognitive" (p > .001), "affective" (p = .001), and "social" strategies (p < .001).

The third MANOVA, with two independent variables, "group" (dyslectic vs. non-dyslectic) and "self-rated proficiency", and five dependent variables, ("memory", "metacognitive", "cognitive", "affective", "social"), indicated no statistically significant interaction effect between "group" and "self-rated proficiency" on the combined dependent variables (F (4, 127) = .919, p = .575, η^2 = .046) nor a main effect of "self-rated proficiency" (F (4, 127) = 1.295, p = .160, η^2 = .063) or "group" (F (1, 127) = 1.955, p = .078, η^2 = .095).

Finally, the results of the last MANOVA, with two independent variables, "group" (dyslectic vs.

non-dyslectic) and "motivation", and five dependent variables, ("memory", "metacognitive", "cognitive", "affective", "social"), yielded no statistically significant interaction effect between "group" and "motivation" on the combined dependent variables (F (2, 129) = 1.060, p = .395, η^2 = .051), nor a main effect of "group" (F (1, 129) = 1.967, p = .076, η^2 = .091). On the contrary, a statistically significant main effect of "motivation" was found (F (2, 129) = 2.271, p = .010, η^2 = .103). Post hoc test Bonferroni revealed that very highly motivated learners had significantly better scores than low-motivated peers in "cognitive" (p = .015), "metacognitive" (p = .001), "affective" (p = .007), and "social" strategies (p = .013). Very highly motivated learners had significantly better scores than highly-motivated peers in "metacognitive" (p = .003), "affective" (p = .020) and "social" strategies (p = .045).

5. Discussions

The present study investigated:

➢ the overall and by category LLS use of dyslectic and non-dyslectic Greek-speaking learners, aged 9-15 years old who learn English as foreign language,

➢ the effect of gender, educational level, self-perceived proficiency and motivation to overall strategy use by dyslectic and non-dyslectic learners, and

➢ the effect of gender, educational level, self-perceived proficiency and motivation to separate strategy category use by dyslectic and non-dyslectic learners.

5.1 Comparison of overall and by category LLS use of dyslectic and non-dyslectic Greek-speaking learners

We expected medium strategy use by the non-dyslectic sample and low use of LLS by learners with dyslexia compared to learners without dyslexia. Our findings did not confirm our expectation. A 'medium use' was found for both the experimental and the control group with the control group edging toward high use and the experimental group toward low use. This result aligns with contemporary research which reports 'medium use' of strategies by typical population (Lan & Oxford, 2003; Yang, 2007; Mitits, 2015; Gavriilidou & Petrogiannis, 2016b; Psaltou-Joycey & Gavriilidou, 2017; Gavriilidou et al., 2020; Mitits et al., 2020) and additionally offers for the first time data for LLS use by the dyslectic population that seem to support that dyslectic learners follow the same pattern as the typical ones regarding frequency of strategy use. The current finding has crucial implications for school and classroom practices, since it suggests that there is an urgent need to intensify strategic instruction to both groups and to encourage learners employ strategies to facilitate or further develop their FL. It was also found that the higher mean score for the control group was in metacognitive strategies, and for the experimental one in compensation strategies. We interpret this finding as indicating that, on the one hand, typical population displays a need to manage the learning process, plan, monitor and control their learning, while, on the other hand, the dyslectic learners look for techniques to make up for drawbacks during language learning and thus compensate to overcome deficiencies in the learning process or FL use. The 'high' use of metacognitive strategies by typical population is also often reported in previous research (Green, 1991; Oh, 1992; Mitits, 2015; Gavriilidou & Petrogiannis, 2016b; Gavriilidou et al., 2020) held with samples with different characteristics.

On the other hand, a statistically significant overall strategy use by the control group was expected. The results of all the analyses carried out in the present study confirmed this hypothesis. Even though strategy use of both the control and the experimental group falls within 'medium range', the control group reported using significantly more overall strategies than the experimental group. The reason for this might be that as dyslectic learners encounter difficulties in FL learning they do not invest in LLS use or even they don't know how to be strategic, possibly because they are not trained by their teachers to do so. Another explanation might be that teachers themselves are not aware of the importance of strategic learning for learners with dyslexia nor trained in strategic instruction. It should be mentioned, though, that the role of teachers is crucial; they need to have constant in-service training and gain expertise, so that they systematically incorporate strategic teaching into the

educational setting, model strategy use in classroom, encourage and monitor the dyslectic learners successfully to adopt LLS, create learning contexts were dyslectics can practice LLS and provide appropriate teaching materials that support all the actions proposed above.

5.2 The effect of gender, educational level, self-perceived proficiency and motivation to overall strategy use by dyslectic and non-dyslectic learners

We expected girls to outperform boys, junior secondary learners to use more strategies, learners reporting higher self-perceived proficiency to demonstrate better scores than their peers who reported a lower proficiency and finally the more motivated learners to outperform the less motivated ones. Findings of this study did not confirm all our hypotheses. The ANOVAs yielded no statistical results for gender and educational level, contradicting previous research which found statistically significant differences for these variables (for gender, see Ehrman & Oxford, 1989; Nyikos, 1990; Oxford & Nyikos, 1995; Peacock & Ho, 2003; and for educational level, see Oxford & Nyikos, 1989; Mitits, 2014; Gavriilidou & Petrogiannis, 2015). However, it is in line with research by Ehrman and Oxford (1990), Griffiths (2003), Psaltou-Joycey (2008), Vandergrift (1997) who also found no statistical differences in language learning strategy use by gender. In a similar fashion our data suggest that gender and educational level do not affect overall strategy use.

On the contrary, ANOVAs yielded statistically significant effects for self-perceived proficiency and motivation. It was found that learners with high and very high self-perceived proficiency outperformed in the total score learners who reported low proficiency independently of the group to which they belonged (dyslectic vs. non-dyslectic). In other words, the higher the learner's self-perceived proficiency, the more learning strategies they reported that they use. This higher self-reported use of strategies was accompanied by higher self-perceived proficiency in a causal bi-directional relation, as we will show in the next paragraph. This finding parallels the work of Oxford and Nyikos (1989) who found a similar pattern and that of Pintrich & De Groot (1990, p. 37) who claimed that "Self-efficacy was positively related to learners' cognitive engagement and performance. Learners who believed they were capable were more likely to report use of cognitive strategies, to be more self-regulating in terms of reporting more use of metacognitive strategies, and to persist more often at difficult or uninteresting academic tasks". This finding is of major importance for classroom instruction since, according to Schunk (1985), improving learners' self-perceived proficiency may result in increased strategy use.

It was also found that the more motivated the learners were (dyslectic or not), the more strategies they reported they use. This finding supports previous research which listed motivation among the factors with the most pervasive impact on the reported strategy use and L2 learning (Bernaus & Gardner, 2008; Oxford & Nyikos, 1989). Highly motivated learners display an active involvement in learning. According to Oxford and Nyikos (1989, p. 295) "Not only does high motivation lead to significant use of language learning strategies […], but high strategy use probably leads to high motivation as well", since successful strategy use raises (actual or self-perceived) proficiency, which in turn increases self-esteem, which finally increases motivation and vice-versa. Seen from this perspective, self-perceived proficiency may be the cause or the result of successful strategy use.

5.3 The effect of gender, educational level, self-perceived proficiency, and motivation to separate strategy category use by dyslectic and non-dyslectic learners

The MANOVAs yielded no statistical results for gender, educational level, and self-perceived proficiency, indicating that these variables do not affect the selection of different strategy categories. Statistically significant differences were found only for group (dyslectic vs. non dyslectic) and motivation.

The findings showed that non-dyslectic learners reported a significantly higher use of memory, cognitive, metacognitive, affective, and social strategies than their dyslectic peers. The significantly higher use of memory strategies by the non-dyslectic learners may be linked in important ways to teaching methods applied in

classroom in Greek schools, where rote memorization is promoted by teachers. The control group also used significantly more cognitive and metacognitive strategies than the experimental group. Cognitive strategies are highly associated with the ability to relate new information with existing data in the long-term memory, analyze linguistic structures, find analogies, learn, remember, and understand the language. However, it is known that dyslectic learners display weaknesses in cognitive abilities, such as working memory, executive functions or attention and these characteristics may prevent them from using cognitive strategies. Metacognitive strategies, on the other hand, include planning of language use, monitoring and self-regulation of learning or self-evaluation of the learning process, which are considered in previous literature (Oxford et al., 2004; Chevalier et al., 2015) as tasks that are difficult to be achieved by dyslectic learners. Thus, this might be one possible explanation for the low use of metacognitive strategies by the dyslectic sample.

Additionally, the control group used significantly more affective strategies than the dyslectic peers. This type of strategies refers to emotional regulation and relaxing during the learning process. Dyslectic learners are often uncertain about their answers, while their fear of providing erroneous linguistic productions refrains them from adopting affective strategies. The last category used significantly more by the control group was that of social strategies. Social strategies include asking questions, interacting in classroom, and communicating with peers. However, since dyslectic learners face serious problems during language learning or receive criticism for their performance by classmates or teachers, this often leads to loss of self-confidence and self-esteem (Kormos & Csizér, 2010) and, as a result, sometimes to avoidance and loss of the desire to socially interact. In that case, the adoption of social strategies becomes almost impossible.

Finally, motivation significantly affected the selection of different categories of strategies independently of the group (dyslectic vs. non-dyslectics). Very highly motivated learners had significantly better scores than peers with low motivation in cognitive, metacognitive, affective, and social strategies. Moreover, very highly motivated learners had significantly better scores than highly motivated peers in metacognitive, affective, and social strategies. This result supports previous research (Pintrich & De Groot, 1990) which demonstrated that motivated learners are more prone to self-regulation, use of metacognitive strategies and cognitive engagement. This finding is in line with early studies highlighting the pervasiveness of motivation (Oxford & Nyikos, 1989) in strategy use, indicating that motivation is an important component in LLS selection; a new dimension added is that the link between motivation and strategy use is stronger than what we may believe both for typical and dyslexic population. Motivated learners select the same types of strategies whether they belong to the experimental group or not.

6. Conclusion, limitations and further research

This study extended previous research in LLS since it's the first to offer data for strategy use of the under-researched group of dyslectic learners. The major contribution of the research is that, even though a low use of LLS was expected for the experimental group, both dyslectic and non-dyslectic learners' strategy use falls within medium range according to Oxford's (1990) frequency levels. This finding is crucial since it indicates that dyslectic learners follow the same pattern as the typical ones regarding frequency of strategy use and thus LLS training of both groups should focus on how both groups assess specific classroom activities and tasks and chose an appropriate LLS or a combination of them to help themselves successfully respond to the requirements and demands of the task in order to cope with content learning.

The findings also show a significantly higher overall strategy use by the control group. This study also demonstrated statistically significant effects of group, self-perceived proficiency and motivation in overall strategy use and of group and motivation in strategy use by category. These results provide empirical support for the relation between overall and by category strategy use and gender, educational level, self-perceived proficiency, and motivation according to group (dyslectic vs. non-dyslectic).

The findings have important implications for classroom practices, emphasizing that teachers need to

promote strategic learning when teaching to dyslectic learners, especially raise the awareness of this population on cognitive and metacognitive strategies, since these learners struggle to comply with the class requirements compared to non-dyslectic peers. Furthermore, dyslectic learners should be offered daily opportunities to practice LLS in various situations as well as individualized feedback, in order to organize, understand, store and remember key concepts presented in classroom and thus arrive to the aimed strategy mastery. It is also important that teachers adopt teaching material and techniques that enhance strategic learning.

There is an important limitation to this study. First of all, all measures were based on a self-report instrument and self-reported use may just overestimate or underestimate actual strategy use. Thus, the findings of the current study should be complemented by an independent or combined use of non-self-referencing methods, in order to document what learners actually do in the classroom. Finally, more research is needed in order to investigate the motivational orientations and individual strategy use of dyslectic learners and compare it with that of non-dyslectic peers or older dyslectic learners.

Conflict of interest - The authors declare that they have no conflict of interest.

Ethical approval - All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional Ethics Committee of Democritus University of Thrace (60589/2111/31–8-2018), national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards and the Pedagogical Institute of Greece (73931/Γ1).

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