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Intra-individual Variability in the Emergence of Lexical Complexity in Speaking English at Secondary School—A Case Study of a Good, Average, and Poor Language Learner

Abstract

Complex Dynamic Systems Theory (CDST) focuses on second language development (SLD) as opposed to second language acquisition (SLA). Emphasising internal complexity of the language system as well as dynamic and non-linear nature of language development, it represents a new approach to the role of variability which is rooted in developmental psychology. This approach agrees with research findings from the 1980s which identified different types and causes of variability, but it treats variability as the main factor responsible for language development and not as a peripheral phenomenon. Intra-individual variability, defined as differences in the level of a developmental variable within individuals and between repeated measurements, is said to have a positive influence on language development at various levels of proficiency. The present paper describes the third part of the case study whose aim is to analyse intra-individual variability in the emergence of lexical complexity in speaking English as a foreign language at secondary school in the case of a good, average, and poor language learner. The first part of the case study examined this phenomenon with respect to general measures of complexity, accuracy, and fluency, whereas the second part—with respect to specific measures of syntactic complexity. The results of the third part of the case study show some significant differences between the learners in terms of lexical variation as opposed to density, sophistication, and frequency but hardly any such differences in intra-individual variability, pointing at the same time to a weak positive relationship between this type of variability and the rate of development.

Keywords: Complex Dynamic Systems Theory (CDST), lexical complexity, variability, learner corpus, speaking

Introduction

Complex Dynamic Systems Theory (CDST) is an umbrella term recently coined by de Bot (2017) to refer to both Complexity Theory (Larsen-Freeman & Cameron, 2008) and Dynamic Systems Theory (Verspoor, de Bot, & Lowie, 2011). According to this theory, language is a dynamic system consisting of internally complex subsystems which develop at different rates in a non-linear fashion. Informed by microgenetic studies in developmental psychology, the theory represents a new approach to the role of variability in second language development (SLD). The supporters of this theory accept empirical findings from the 1980s which refer to types and causes of variability, but they primarily focus on intra-individual or developmental variability, arguing that it is the main factor influencing language development (van Dijk, Verspoor, & Lowie, 2011). Intra-individual variability is defined as "differences in the level of a developmental variable within individuals and between repeated measurements" (van Geert & van Dijk, 2002, p. 341). In order to examine this kind of variability, dense, longitudinal data based on communicative language use need to be collected. So far few such studies have been conducted (Verspoor, Lowie, & van Dijk, 2008; Spoleman & Verspoor, 2010), which indicates the need to investigate this phenomenon. The first part of the present case study (Rokoszewska, 2019a), which focused on intra-individual variability in the emergence of complexity, accuracy, and fluency in speaking English at secondary school, and the second part, which focused on this phenomenon in syntactic complexity (Rokoszewska, 2019b in press), indicate statistically significant differences between the good, average, and poor language learner in the development of these language subsystems but no such differences in intra-individual variability, pointing, at the same time, to a positive relationship between the learners' level of intra-individual variability and the rate of development of language subsystems in speech at this level. The present paper will focus in more detail on the role of intra-individual variability in the emergence of lexical complexity in speaking English as a foreign language at secondary school in the case of a good, average, and poor language learner.

Variability in SLA and SLD

In second language acquisition (SLA), variability is construed differently in homogenous and heterogenous competence models. The homogenous competence model is based on Chomsky's (1965) theory, in which linguistic compe-

tence consists of invariant rules which categorically state what is grammatically correct in a given language. Stylistic variability is treated as non-systematic and as such it does not constitute a part of language competence but performance. The heterogenous competence model is used in sociolinguistic and psycholinguistic approaches. In the sociolinguistic approach, communicative competence (Hymes, 1971) is said to consist of variable rules which say what grammatical forms will probably appear in some contexts. Variability is said to result from social factors, such as social context, dialect or social groups connected with age, class, and ethnicity. It is treated as systematic and as such it constitutes a part of communicative competence. The sociolinguistic approach is represented mainly by Labov's (1970) studies of variability caused by situational and linguistic factors, Bailey's (1973) study of synchronic variation expressed in Wave Theory, and Decamp's (1971) and Bickerton's (1975) studies of pidgin and creole languages in Guyana. In the psycholinguistic approach, variability is connected with psycholinguistic factors, that is, internal factors which influence processing L2 in different conditions. This approach is represented by Levelt's (1989) and de Bot's (1992) planning models of speech production and Ochs's (1979) studies of planned and unplanned discourse.

Ellis (1994) provides a useful model of variability in learner interlanguage. Generally, he distinguishes between horizontal variability, that is, variability evident in interlanguage at a single point in time, and vertical variability, that is, variability evident in interlanguage over time. Vertical variability refers to the route of SLA, namely, the order of acquisition of grammatical morphemes and the sequence of stages in the acquisition of questions, negations, and relative clauses. Ellis (1994) also distinguishes between intra-learner variability, that is, variability within the learner, and inter-learner or individual variability, that is, variability between learners caused by individual learner differences, such as age, intelligence, language aptitude, cognitive styles, motivation, personality, etc. In his model, variability in interlanguage is divided into systematic and non-systematic variability. Systematic variability is further divided into individual variability, explained above, and contextual variability, which refers to the linguistic and situational context (Tarone, 1983). Non-systematic variability is further divided into performance variability and free variability. Performance variability results from psycholinguistic factors, such as the user's emotional or physical condition, under which the user is not able to perform his or her competence, which leads to slips of the tongue, hesitations, and repetitions. This type of variability, in line with Chomsky's (1965) theory, is not a part of the user's competence. Free variation stands for random use of two or more alternate forms. According to Ellis (1994), the level of free variation is low in native speakers' language but high in learners' interlanguage. Learners use two or more forms at random to realize the same meaning in the same situational, linguistic, and discourse contexts, to perform the same language function, and

in tasks with the same type of information processing. Such variation is said to be random and to result from incorrect form-function relationships. It is also hypothesized to be an important mechanism in interlanguage development as it occurs at a high level at the early stages of SLA, but later it diminishes to make the interlanguage system more advanced and efficient. This is described in Gatbonton's (1978) diffusion model, according to which L2 development consists of two phases, namely, the acquisition phase, during which learners first use a given form in every situation or context, then introduce the second form and use the two forms in free variation, and the replacement phase, during which learners restrict both forms to their correct environments.

Studies summarized by Ellis (1994) indicate that, on the one hand, interlanguage variability is to some extent contextual in that L2 learners' production of selected phonological or syntactic features systematically varies depending on such factors as the formality of the social context, the complexity of the linguistic context, the continuum of styles ranging from the vernacular to the careful style as well as attention, planning, and types of tasks. On the other hand, the studies indicate that some part of interlanguage variability is haphazard, which is due to unsorted form-function relationships. Having provided a detailed summary of the role of variability in SLA, Ellis (1994) concludes that it is a very complex phenomenon which remains unexplained to a large extent.

In second language development, a new approach to variability has been proposed by the proponents of Complex Dynamic Systems Theory (CDST). This approach is rooted in developmental psychology, in which variability has become the main focus of interest since the 1990s. Having analyzed numerous microgenetic studies in this area, the most influential of which is Thelen and Smith's (1994) study, Siegler (2006) makes a few important claims in his position paper. Firstly, he claims that intra-individual variability in the use of strategies is observed in all learners of different age at all stages of learning and levels of proficiency. Secondly, he points out that learners' development in the acquisition of a skill or strategy is not neat but characterized with periods of regression and progression, regression being the biggest in the case of rapid learning. What is more, the periods of regression and progression correspond to the periods of low and high variability which alternate in a cyclical way (Siegler, 2006). Thirdly, he argues that high intra-individual variability has a positive influence on learning in that new strategies are added and more advanced strategies are efficiently used. He also points out that small differences in the so called initial conditions have a serious effect on subsequent development in that learners who use more advanced strategies at the beginning progress faster than learners who use less advanced strategies. Most importantly, however, Siegler (2006, p. 481) concludes that studying intra-individual variability in second language development is important in order to "(a) predict change, (b) analyse change, and (c) understand change mechanisms."

In Complex Dynamic Systems Theory, language is defined as a complex dynamic system which "consists of subsystems which are never entirely stable and may exhibit a great deal of variability, particularly during stages where the whole system is undergoing intensive development" (Verspoor, de Bot, & Lowie, 2011, p. 39). In line with Thelen and Smith's (1994, p. 342) study, variability is treated as "a metric of stability and a harbinger of change." Larsen Freeman, and Cameron (2008) explain that if variability is low, the system has stabilised for a given aspect of language for some period of time. If variability is high, the language system is changing and moving towards another state or stage in development until it settles down again. In other words, the language system is going through a transition period before it settles down again at a different level or attractor state. Verspoor, de Bot, and Lowie (2011) point out that the relationship between variation and change is multilateral. One the one hand, variation leads to flexible and adaptive behaviour, which is a prerequisite to development because without variation there is no selection, but on the other hand, such free exploration in performance causes variability. In other words, variation and selection lead to the storage and repetition of the behaviour which has been more often successful than the behaviour which has been less successful. In this sense, variability in the system is a precursor of change and development. Furthermore, it is generally assumed that free variability takes place at the early stages of language development because the learner tries out different forms to express a given meaning (Verspoor, de Bot, & Lowie, 2011). Such variability will appear in all language subsystems because the learner is not able to master all of them at once. In addition, the learner's language subsystems will compete for different resources. The allocation of a greater amount of resources to one subsystem will cause trade-offs between these subsystems (Verspoor, de Bot, & Lowie, 2011). In other words, second language development, which usually involves a general increase of complexity, accuracy, and fluency, will be characterised by trade-offs between particular language components which are more visible in spoken than written data.

So far few studies on intra-individual variability have been conducted within the CDST framework. Van Geert and van Dijk (2002) demonstrated new tools to study this phenomenon in developmental data. Verspoor, Lowie, and van Dijk (2008) conducted a study on the basis of the data earlier used by Cancino, Rosansky, and Schumann (1978), who found out that the developmental stages of English negative constructions were similar in first and second language acquisition. In their case study, Verspoor et al. (2008) showed that the learners' learning trajectories were different and highly variable. However, despite the significance of some developmental peaks, intra-individual variability in these trajectories was not statistically different among the learners. Larsen-Freeman (2006) discovered substantial inter-individual and intra-individual variability in

language development of five Chinese learners of English on the basis of their oral and written narratives elicited every two months on the same topic over the period of half a year. More specifically, she showed the existence of this phenomenon not only with respect to single language features but, in line with the CDST framework, with respect to whole language subsystems, such as accuracy, fluency, and lexical and grammatical complexity. Spoleman and Verspoor (2010), in a case study of a Dutch learner of Finnish, focused on the relationship between different measures of syntactic complexity and accuracy, arguing that intra-individual variability occurred in the vicinity of developmental jumps and signalled transition phases between two periods. Kowal (2016), who examined the dynamics of complexity, accuracy, and fluency in Polish adult learners of Swedish, emphasised the importance of both inter- and intra-individual variability and concluded that the three subsystems, separate at the beginning of language development, become gradually integrated in the learner's mind so that the discrepancy between them diminishes, leading to similar levels of proficiency. Pfenniger's (2019) longitudinal study, which traced language development of children who were learning English in minimal, partial, and full Content and Language Integrated Learning (CLIL) programmes in Austria and Switzerland for eight years, provides some evidence that higher intra-individual variability precedes significant growth in the trajectories of individual learners with respect to various indices of language development. The present case study of a good, average, and poor language learner focuses on intra-individual variability in the emergence of complexity, accuracy, and fluency in speaking English as a foreign language at secondary school. In the first part of the case study, the research questions referred to (1) the learners' results on the development of syntactic complexity, lexical complexity, accuracy, and fluency in oral production at secondary school, (2) the types of relationships which can be observed between these variables over time, (3) the rate of development of these variables, (4) the levels and patterns of intra-individual variability in the development of these variables, and (5) the influence of intra-individual variability on the rate of development of these variables (Rokoszewska, 2019a). The second part of the case study addressed the same research questions but with respect to such measures of syntactic complexity as general sentence complexity, subordination, coordination, and nominalisation (Rokoszewska, 2019b). In general, the results of the first two parts of the case study indicate that there exist some statistically significant differences between the good, average, and poor language learner in the development of particular variables and that these variables form different dynamic relationships in the case of different learners. The results also show that the differences in intra-individual variability in the development of these variables are statistically insignificant. Nevertheless, the relationship between the learners' level of intra-individual variability and the rate of development of language subsystems in speech at this level is positive.

The third part of the present case study will examine the phenomenon of intra-individual variability in the emergence of lexical complexity in speaking English as a foreign language at secondary school in the case of a good, average, and poor language learner. Lexical complexity or richness is construed as a multidimensional phenomenon which consists of a number of interrelated components, such as lexical density, sophistication, variation, and frequency. Lexical density (Ure, 1971) refers to the ratio of lexical words to all words in a text. Lexical sophistication or rareness stands for the proportion of advanced words in a text (Read, 2000). Lexical variation, also called lexical diversity (Malvern, Richards, Chipere, & Duran, 2004) and lexical range (Crystal, 1982), measures the range of vocabulary displayed in a text. Lexical frequency indicates the proportion of word types from different frequency levels (Laufer & Nation, 1995). Lexical complexity may be investigated by means of various measures (Wolfe-Quintero, Ingaki, & Kim, 1998; Malvern et al., 2004), some of which will be used in the present case studySumming up, the CDST approach to variability is different than the approaches offered so far. In the nativist approach, variability was not taken into consideration as the main aim was to find universal and systematic patterns of language development. In the sociolinguistic and psycholinguistic approaches, the main aim was to discover external causes of variability. In the CDST approach, variability is said to be a potential driving force of development and a potential indicator of the ongoing process (van Geert & van Dijk, 2002).

Method

As it has already been mentioned, the present paper describes the third part of the case study whose general aim is to investigate intra-individual variability in the emergence of language in oral production at the level of secondary school. The first part of the present case study (Rokoszewska, 2019a) focused on intra-individual variability in the emergence of complexity, accuracy, and fluency in speaking English at secondary school while the second part focused on this phenomenon in syntactic complexity (Rokoszewska, 2019b). The results of the first part of the case study show that the good learner produced more complex, accurate, and fluent language in speech than the average learner and poor learner whose language did not differ. The results of the second part of the case study were similar as it was found out that, in the case of syntactic complexity, the good learner produced more complex language in terms of subordination and nominalisation, but not coordination, while the language of the average and poor learner was the same. Furthermore, both parts of the

case study reveal a diversity of dynamic relationships between selected variables which may be supportive, competitive, pre-conditional or dual but which are not always the same for the good, average, and poor learner. In addition, the patterns of intra-individual variability illustrate that the periods of higher variability are interchanged with the periods of stability in different language subsystems in the case of all three learners. Although these patterns seem to be qualitatively unique for each learner because of time, duration, and intensity, there are no statistically significant differences between the learners in intra-individual variability in particular language subsystems. Finally, the results indicate a positive relationship between the learners' level of intra-individual variability and the rate of development of language subsystems in speech at the level of secondary school.

Having investigated the phenomenon of intra-individual variability in speaking English at secondary school with respect to general measures of language development and more specific measures of syntactic development in the case of a good, average, and poor language learner, it is necessary to focus on particular measures of lexical development in order to investigate the phenomenon in question more thoroughly. Hence, the aim of the third part of the case study is to investigate the phenomenon of intra-individual variability in the emergence of lexical complexity in speaking English as a foreign language at secondary school in the case of a good, average, and poor language learner. As already explained, intra-individual or developmental variability is defined as differences in the level of a particular variable within an individual learner between repeated measurements conducted over a longer period of time (van Geert & van Dijk, 2002). In line with Larsen-Freeman and Cameron (2008), the term *emergence* refers to microgenetic growth in the development of a particular language subsystem which is observed at many regular measurement points in a time series. The research questions are as follows:

1. How does lexical complexity emerge in speaking English as a foreign language at secondary school in the case of a good, average, and poor learner?
2. What is the developmental rate of different measures of lexical complexity in L2 English speech in the case of these learners?
3. What are the levels and patterns of intra-individual variability in the development of lexical complexity in L2 English speech in the case of the learners?
4. What is the influence of intra-individual variability on the rate of development of lexical complexity measures in this context?

The research method is a corpus-based case study which constitutes a part of a larger quantitative and qualitative research project. The case study is dense and longitudinal as it is based on repeated measurements of learners' speech conducted over a longer period of time. The case study is also exploratory as

its aim is to analyse intra-individual variability in language development of a good, average, and poor learner, which will be followed by a quantitative study whose aim will be to analyse language behaviour of the whole group and subgroups of particular types of learners. This type of study has been chosen since the proponents of CDST claim that "if we really want to find out how an individual or (group) develops over time we need data that is dense (i.e. collected at many regular measurement points), longitudinal (i.e. collected over a longer period of time), and individual (i.e. for one person at a time and not averaged out)" (van Dijk, Verspoor, & Lowie, 2011, p. 62). They also point out that "only a few case studies focusing on the variability patterns in SLD have been conducted so far […] and more longitudinal dense case studies are needed to discover the possible developmental L2 patterns for individual learners and groups of learners" (van Dijk, Verspoor, & Lowie, 2011, p. 84).

The case study is based on three mini-corpora selected from the learner developmental corpus of spoken English which consists of 106 mini-corpora (ca. 2,100 recorded interviews) built on the basis of the study conducted at one of secondary schools in Czestochowa in 2014–2017. The chosen mini-corpora trace language development of a good, average, and poor language learner in oral production at secondary school.[1] Each mini-corpus is built of 21 interviews which were conducted once a month over the period of three years (Table 1). The procedure of building the mini-corpora involved conducting, recording, storing, transcribing, verifying, and analysing the interviews on the basis of samples consisting of ca. 200 words. The interviews were semi-structured in that the questions had been prepared in advance but during the interview some additional questions were asked if necessary. The interviews were of descriptive and argumentative character and referred to topics that were covered during English lessons on the basis of the learners' coursebook. Before the interview, the learners knew a general topic but did not know the questions to avoid pre-planned speech. The aim of the interviews was to elicit data produced under "relatively natural conditions," that is, "data where all aspects of the linguistic production process are, as far as possible, fully under the control of the learner" (Schmid, Verspoor, & MacWhinney, 2011, p. 39). Following the study by Laufer and Nation (1995), the interviews were integrated with the learners' formal assessment so that they would not treat the interviews as purely additional assignments. The learners were assessed by the interviewer on the basis of the school internal criteria developed by the board of English teachers. After each interview, the learners were given some feedback and points from one to six, the average of which was put into the register in the form of a grade at the end of each semester. The interviewer's experience as a language teacher

[1] At the time of the research project, secondary school in Poland included three grades consisting of learners at the age of 16–19. Since September 1, 2019, it has included four grades consisting of learners at the age 15–18.

and teacher trainer based on her specialisation in second language acquisition and methodology of teaching foreign languages contributed to the validity and reliability of the assessment.

Table 1

Research design in time series

Research design in time series										
Data	Semester 1					Semester 2				
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June
GRADE 1	Org.	Test 1 Fashion	Test 2 Internet	Test 3 Music	Test 4 Education	Winter break	Test 5 Ecology	Test 6 Pets	Test 7 Work	Test 8 Holidays
GRADE 2	Org.	Test 9 Books & films	Test 10 Shopping	Test 11 Friendship	Test 12 Christmas	Winter break	Test 13 Family	Test 14 Health	Test 15 Fame	Test 16 Home & living
GRADE 3	Org.	Test 17 Love	Test 18 TV	Test 19 Crime	Winter break	Test 20 Terrorism	Test 21 Tolerance	End of school-year	Matura exam	-

In the present study, a number of variables has been identified. The independent variable refers to intra-individual variability in the development of lexical complexity operationalized as the differences in the level of lexical complexity measures between regular oral tests within individual learners. The scale for this variable is interval. To be more precise, lexical complexity is understood as consisting of lexical density, sophistication, variation, and frequency. Lexical density (LD) is defined as the number of lexical tokens, that is, nouns, verbs, adjectives, and adverbs, per total number of tokens (Laufer & Nation, 1995). Lexical sophistication (LS) refers to the number of more advanced tokens per total number of lexical tokens (Laufer & Nation, 1995). Lexical variation (LV), often treated as an equivalent of lexical complexity, is operationalized in terms of sophisticated or complex type-token ratio (CTTR), which takes into account the length of the sample (Ellis & Barkhuizen, 2005; Larsen-Freeman 2006). Lexical frequency refers to the percentage of words used by the learner at different frequency levels (Laufer & Nation 1995) based on BNC COCA Core-4, that is, a list of the first 3,000 words and words off this list which is based on the British National Corpus (BNC) and the Corpus of Contemporary American English (COCA). The dependent variable refers to the rate of development of lexical complexity measures operationalized as the differences in the level of these measures between the first and the last test. The scale for this variable is interval. The intervening variable may be defined as the influence of variability on second language development, the scale for this variable being interval. The moderator variable refers to learners' age determined by means of the nominal scale. The control variables, measured by the nominal scale, refer to learners' nationality, course-book, number of English lessons per week, and no longer stay in the target language country.

Research instruments used to gather data involved the oral interviews mentioned above, whereas the instruments used to analyse data included Lexical Complexity Analyser (Ai & Lu, 2010) and Compleat Web Vocabulary Profiler (Cobb, 2018) as well as a number of CDST procedures (Verspoor, Lowie, van Geert, van Dijk, & Schmid, 2011). These procedures involved smoothing raw data by means of polynomial trendlines of the 2nd degree to show general trends, normalising and detrending data to visualise intra-individual variability as a moving range of minimum and maximum scores, and checking the statistical significance of the differences in intra-individual patterns by means of a resampling procedure called a Monte Carlo Analysis.

The subjects in the present case study were three 16-year-old secondary school learners who had been learning English for about ten years by the time of the study and who attended classes with an extended English programme (4–6 lessons per week), not participating in extra-curricular English courses at the time of the study. They were selected from the sample of 106 subjects on the basis of the points given for a placement test, a written assignment and an oral interview conducted at the beginning of secondary school. The good learner (GL) obtained an average of 5.5 points, the average learner (AL) (3.45 points), and the poor learner (PL) (2.17). More detailed information about the subjects is summarised in Table 2.

Table 2

The subjects in the case study

	Good learner			Average learner			Poor learner		
Gender	female			male			male		
Age	16–19 (grades 1–3)								
Exposure to L2	10 years (grade 1); 4–6 lessons (1–3 grades)—extended English programme no extra classes, no longer stay in an L2 country								
Residence	city			village			city		
Education (F/M)*)	higher / higher			secondary / higher			higher / higher		
Employment (F/M)	white collar worker/ white collar worker			blue collar worker/ white collar worker			white collar worker/ white collar worker		
English (F/M)**)	very good / basic			basic / average			very good/ basic		
GPA	5.01			4.25			3.54		
Grades in Eng. Final exam (%)	5.17			3.92			2.67		
	Basic	Extended	Oral	Basic	Extended	Oral	Basic	Extended	Oral
	100.0	98.0	100.0	70.0	66.0	77.0	98.0	–	96.0
Classification (pts./ grades)	Test	Speak.	Writ.	Test	Speak.	Writ.	Test	Speak.	Writ.
	6.0 (93pts.)	5.0	5.5	3.0 (61pts.)	3.75	3.5	1.0 (36pts.)	2.0	3.5
	Total—5.5 pts.			Total—3.42 pts.			Total—2.17 pts.		

*) F/M—father/ mother

**) The students' opinions about their parents' knowledge of English.

Results

The Development of Lexical Complexity

The results of the present study (Table 3) show that with respect to the development of lexical variation, the sophisticated type-token ratio was 4.40 for the good learner (GL), 4.04 for the average learner (AL), and 3.91 for the poor learner (PL). The rate of development for the good learner is equal to 0.73 as this learner obtained the score of 4.08 on the first test, that is, test 1 in grade 1, and the score of 4.81 on the last test, that is, test 21 in grade 3. At the same time, the learner's minimum score was 3.76 (test 7, grade 1), while the maximum score was 5.02 (test 11, grade 2), which yields the variation equal to 0.15 in the whole data set. The average and poor learner obtained the following results for the rate of development: AL (0.28), PL (–0.22), as well as for variation: AL (0.21), PL (0.10) (see Table 3). In addition, it may be observed that the general trend in the development of lexical variation in speaking English at secondary school is rather stable in the case of all three learners (Figures 1.1, 1.2, and 1.3).

Table 3

The development of lexical complexity in L2 English speech—raw data

The development of lexical complexity—raw									
Data	Lex. variation			Lex. density			Lex. sophistication		
	GL	AL	PL	GL	AL	PL	GL	AL	PL
Test 1	4.08	3.75	3.88	0.48	0.52	0.50	0.15	0.26	0.25
Test 21	4.81	4.03	3.66	0.44	0.49	0.48	0.21	0.18	0.19
RD	0.73	0.28	–0.22	–0.04	–0.03	–0.02	0.06	–0.08	–0.06
Min.	3.76	3.14	3.27	0.41	0.40	0.36	0.03	0.10	0.12
Max.	5.02	5.15	4.41	0.55	0.56	0.60	0.31	0.26	0.35
CV	0.15	0.21	0.10	0.00	0.00	0.00	0.00	0.00	0.00
Mean	4.40	4.04	3.91	0.46	0.48	0.48	0.18	0.18	0.21
SD	0.39	0.47	0.33	0.04	0.04	0.06	0.07	0.06	0.07
ANOVA (p=0.05)		0.001			0.505			0.217	
TUKEY-KRAMER TEST		GL≠AL GL≠PL AL=PL			–			–	

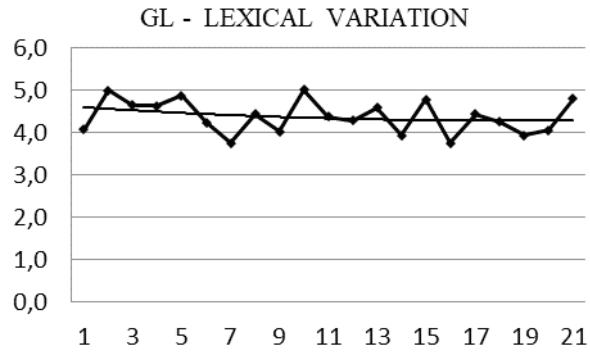

Figure 1.1. GL–lexical variation.

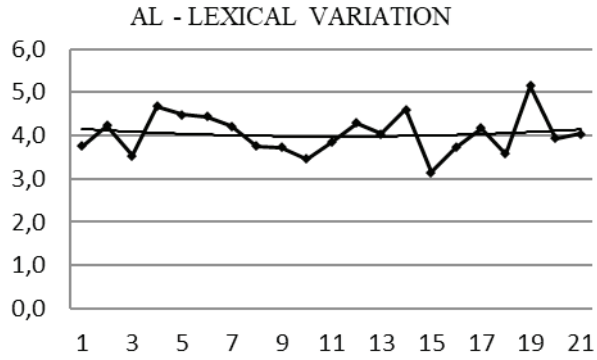

Figure 1.2. AL–lexical variation.

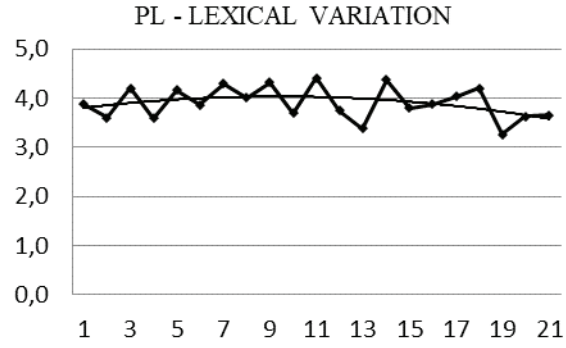

Figure 1.3. PL–lexical variation.

With respect to lexical density (Table 3), the learners obtained the following results: GL (0.46), AL (0.48), PL (0.48), the results for the rate of development being GL (–0.04), AL (–0.03), PL (–0.02) with the level of variation equal to 0.00 for all of them. The general trend in the development of lexical density

in speaking English at secondary school is rather stable for all three learners, though a very slight decrease may be noticed through the whole period in the case of the good and poor learner and, in the middle of this period, for the average learner (Figures 2.1, 2.2, and 2.3).

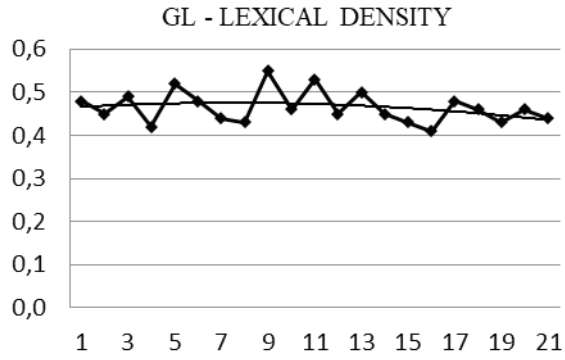

Figure 2.1. GL–lexical density.

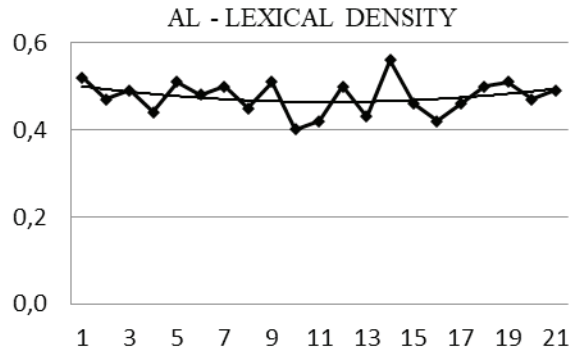

Figure 2.2. AL–lexical density.

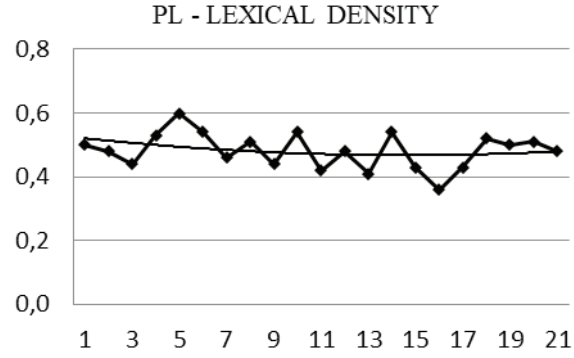

Figure 2.3. PL–lexical density.

With respect to lexical sophistication, the learners' results were as follows: GL (0.18), AL (0.18), PL (0.21), the results for the rate of development being GL (0.06), AL (0.08), PL (–0.06) with variation of 0.00 for all learners (Table 3). The general trend in the development of lexical sophistication indicates some decrease in the middle of the observation period for the good learner and a substantial decrease for the average and poor learner in the whole period (Figures 3.1, 3.2, and 3.3).

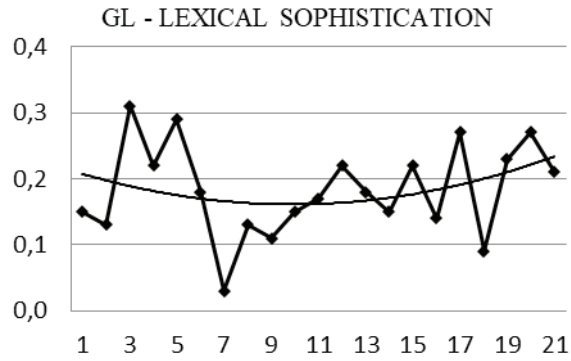

Figure 3.1. GL–lexical sophistication.

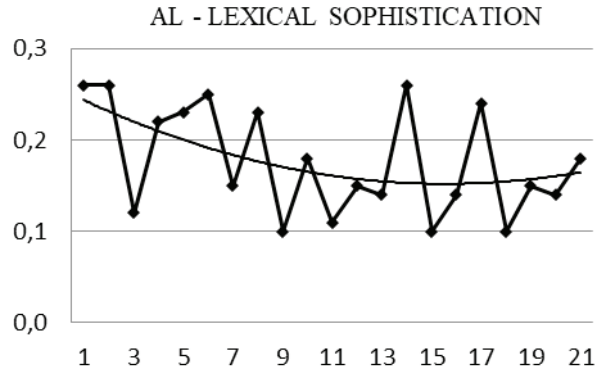

Figure 3.2. AL–lexical sophistication.

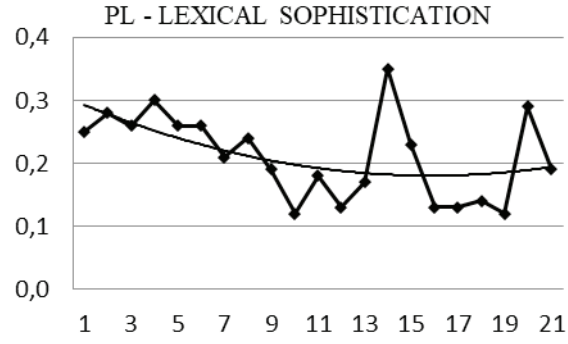

Figure 3.3. PL–lexical sophistication.

The differences between the learners' results (Table 3), analysed by means of one-way ANOVA, are statistically significant in terms of lexical variation but not lexical density and sophistication. Yet, a further analysis of the results on lexical variation, conducted by Tukey-Kramer Test,[2] that is, a means differentiation test, reveals that the differences between the good learner and average learner as well as between the good learner and poor learner are statistically significant, but the difference between the average learner and poor learner is not. Subtle differences between the learners are exemplified on the basis of test 2 (see Appendix). The orthographic transcripts include texts which were first extracted from the interview and cleared from pauses, hesitations or disfluencies, and then processed by the two computer programmes mentioned above.

The Development of Lexical Frequency

The results of the study on the development of lexical frequency in speaking English at secondary school (Table 4) indicate that the good learner on average uses 91.67%, the average learner—90.58%, and the poor learner—88.75% of words that belong to the first 1,000 words on the BNC COCA Core-4 list. The learners obtained the following results on the rate of development: GL (–0.15),

Table 4

The development of lexical frequency l2 English speech—raw data

The development of lexical frequency—raw data												
Data	Lexical frequency (1K)			Lexical frequency (2K)			Lexical frequency (3K)			Lexical freq. (off list)		
	GL	AL	PL	GL	AL	PL	GL	AL	PL	GL	AL	PL
Test 1	91.51	87.50	87.04	2.36	4.89	4.32	2.36	3.80	4.32	3.77	3.80	4.32
Test 21	91.36	90.63	91.17	3.18	4.17	2.94	2.73	2.08	2.45	2.73	3.12	3.43
RD	–0.15	3.13	4.13	0.82	–0.72	–1.38	0.37	–1.72	–1.87	–1.04	–0.68	–0.89
Min.	82.67	82.67	76.14	0.98	0.96	1.00	0.45	0.00	0.00	0.49	0.00	0.51
Max.	96.38	95.55	95.34	9.90	9.00	14.20	4.50	5.63	9.42	7.61	6.38	8.24
CV	14.87	13.44	26.23	5.01	5.60	10.27	2.00	1.78	5.04	2.32	2.69	4.67
Mean*	91.67	90.58	88.75	2.83	4.02	3.79	1.51	1.16	0.92	2.24	1.32	2.69
SD	3.95	3.76	5.25	2.29	2.43	3.28	1.45	1.37	2.30	1.56	1.68	2.21
ANOVA (p=0.05)		0.144			0.229			0.338			0.296	

*) The geometric mean shows the central tendency in a set of numbers by using the product of their values; suitable to show a typical value in a set of numbers expressed in percentages; always lower than the arithmetic mean.

[2] Detailed results of this test are not provided as it involves the comparison of absolute difference and critical range.

AL (3.13), PL (4.13) and on variation: GL (14.87), AL (13.44), PL (26.23). The general trend is rather stable for the good and poor learner (Figures 4.1 and 4.3), with a very slight increase at the end of the observation period in the case of the former and in the middle for the latter. In the case of the average learner, the trend shows a substantial increase in the middle and some decrease towards the end of the period (Figure 4.2).

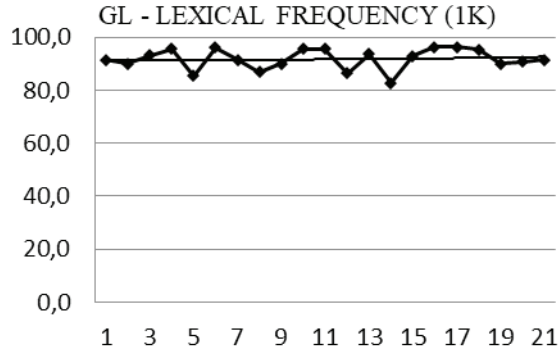

Figure 4.1. GL–lexical frequency (1K).

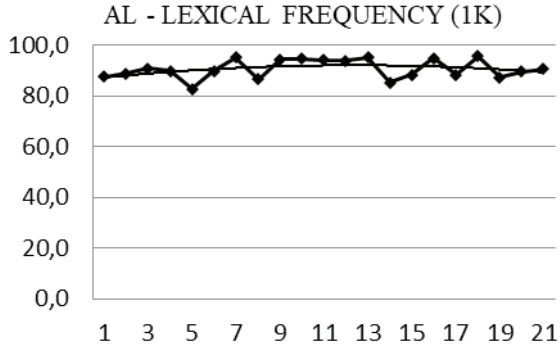

Figure 4.2. AL–lexical frequency (1K).

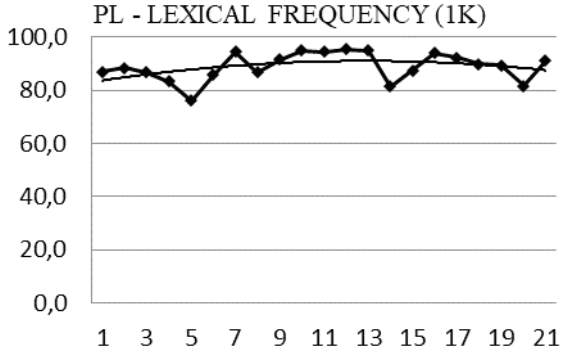

Figure 4.3. PL–lexical frequency (1K).

With respect to the second 1,000 words (Table 4) on the BNC COCA Core-4 list, it is shown that the good learner on average used 2.83%, the average learner—4.02%, and the poor learner—3.79% of these words. The learners' results on the rate of development were as follows: GL (0.82), AL (–0.72), PL (–1.38). Their results on variation were: GL (5.01), AL (5.60), PL (10.27).

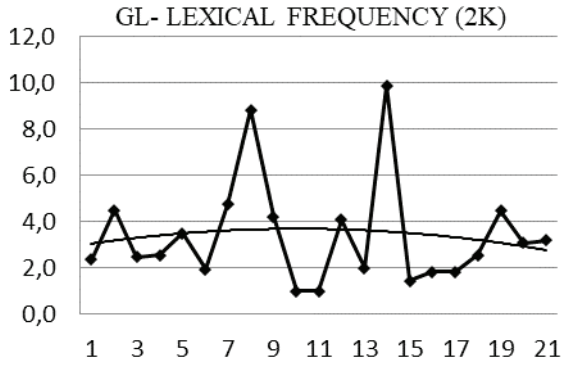

Figure 5.1. GL–lexical frequency (2K).

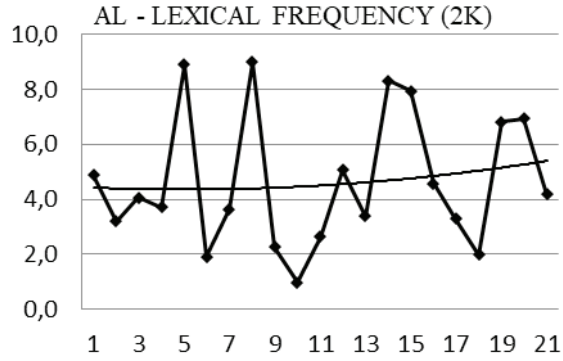

Figure 5.2. AL–lexical frequency (2K).

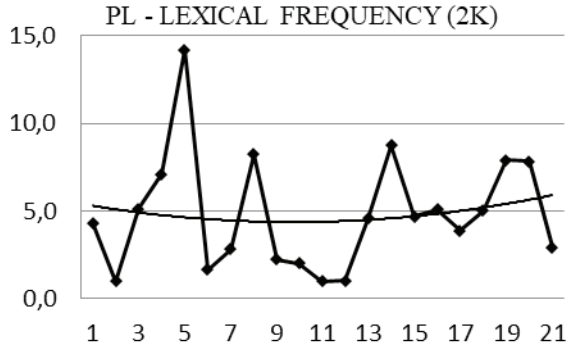

Figure 5.3. PL–lexical frequency (2K).

The general trendline shows a slight increase for the average learner, a slight increase and then decrease for the good learner, the opposite being true for the poor learner, in whose case first a slight decrease and then increase are observed (Figures 5.1, 5.2, and 5.3).

With respect to the third 1,000 words (Table 4), it is observed that the good learner on average used 1.51%, the average learner—1.16%, and the poor learner—0.92% of words from this frequency band. The learners' results on the rate of development were as follows: GL (0.37), AL (–1.72), PL (–1.87). Their results on variation were: GL (2.00), AL (1.78), PL (5.04). The general trend indicates a substantial decrease in the development of 3,000 words in speaking English in the middle of the observation period in the case of all three learners (Figures 6.1, 6.2, and 6.3).

Finally, with respect to the use of words which are not included in the first 3,000 words (Table 4), the results show that the good learner used 2.24%, the average learner—1.32%, and the poor learner—2.69% of such lexical items. The learners' rate of development equalled: GL (–1.04), AL (–0.68), PL (–0.89), whereas their variation was: GL (2.32), AL (2.69), PL (4.67). The general trend

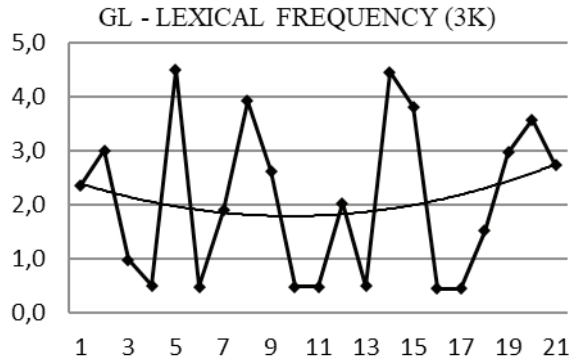

Figure 6.1. GL–lexical frequency (3K).

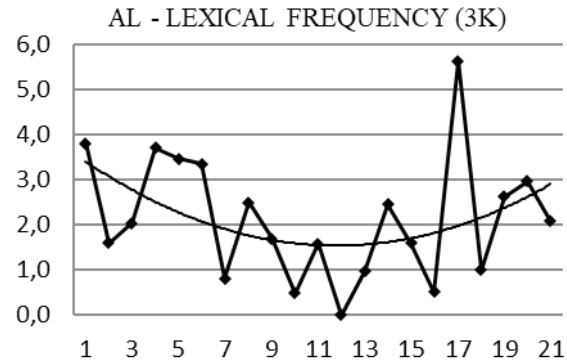

Figure 6.2. AL–lexical frequency (3K).

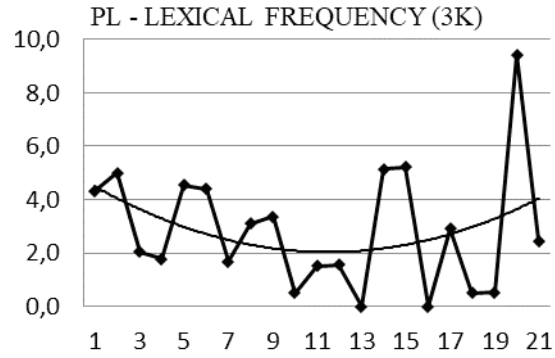

Figure 6.3. PL–lexical frequency (3K).

illustrates a slight decrease in the case of the good learner and a substantial decrease in the case of the average and poor learner (Figures 7.1, 7.2, and 7.3).

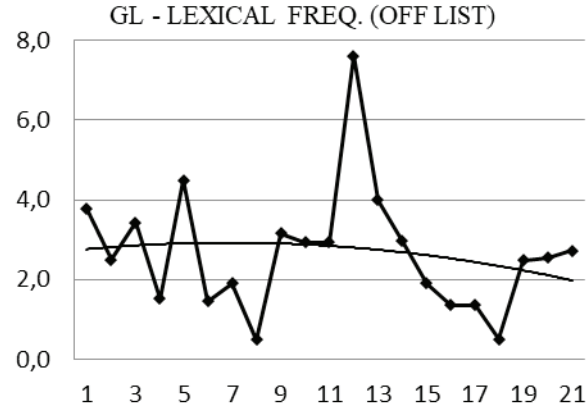

Figure 7.1. GL–lex. frequency (OFF LIST).

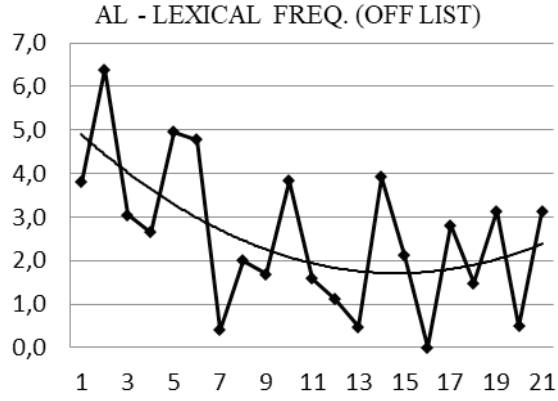

Figure 7.2. AL–lex. frequency (OFF LIST).

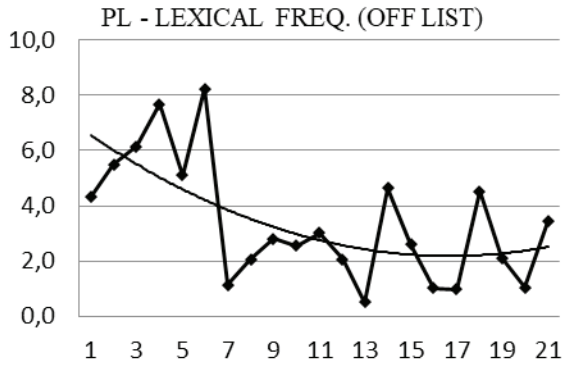

Figure 7.3. PL–lex. frequency (OFF LIST).

Summing up, the learners' lexical frequency profiles (LFPs), which show 1,000, 2,000, 3,000 words and words off the list, are as follows: the good learner—91.08%; 3.40%; 2.10%; 2.70%; the average learner—90.66%; 4.65%; 2.13%; 2.56%, and the poor learner––88.90%; 4.83%; 2.86%; 3.40%, there being no statistically significant differences between them. The learners' profiles are exemplified on the basis of test 2 (Appendix).

The Patterns of Intra-individual Variability

The patterns of intra-individual variability in the development of lexical variation in speaking English at secondary school indicate rather high variability throughout the whole observation period for the good learner. In the case of the average and poor learner, variability is rather low at the beginning (AL—tests 1–10; PL––tests 1–7) and rather high later on (AL—tests 10–21; PL—tests 7–13 and 15–21) (Figures 8.1, 8.2, and 8.3). In all three cases, the bandwidth becomes broad at the end of the observation period, which is indicative of potential change and development in this variable.

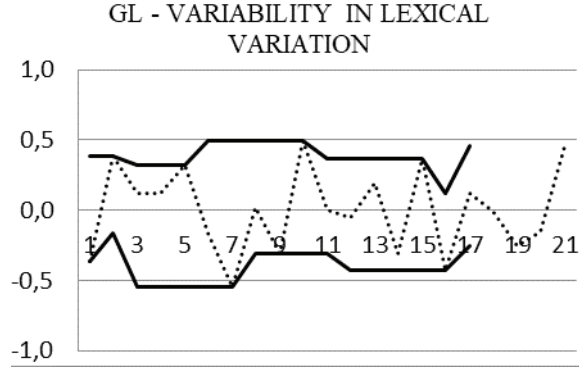

Figure 8.1. GL–variability in lex. variation.

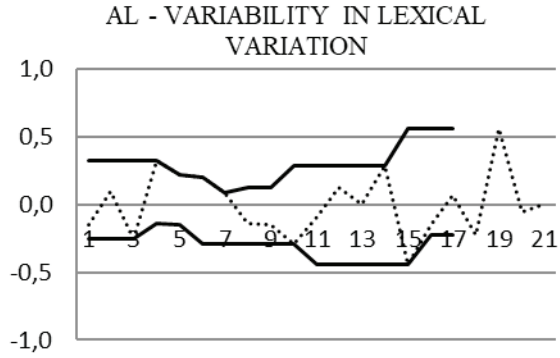

Figure 8.2. AL–variability in lex. variation.

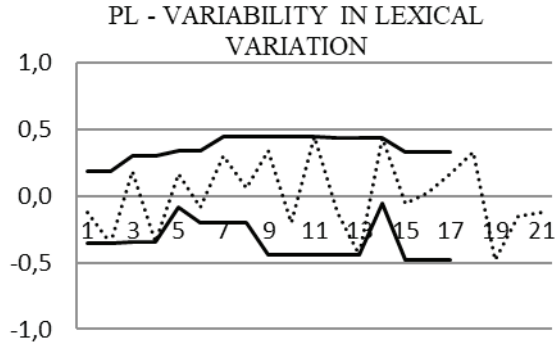

Figure 8.3. PL–variability in lex. variation.

Intra-individual variability in the development of lexical density in English L2 speech at secondary school in the case of the good learner is rather high in the first half (tests 1–11) but rather low in the second half (tests 12–21) of the observation period (Figure 9.1). In the case of the average learner, variability is the biggest in the middle of the observation period (Figure 9.2).

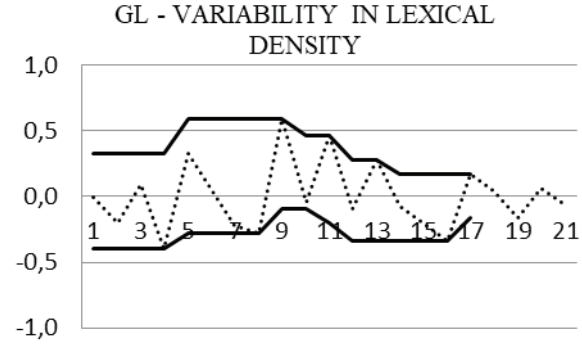

Figure 9.1. GL–variability in lex. density.

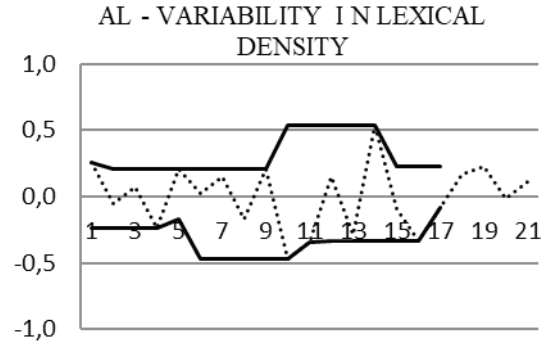

Figure 9.2. AL–variability in lex. density.

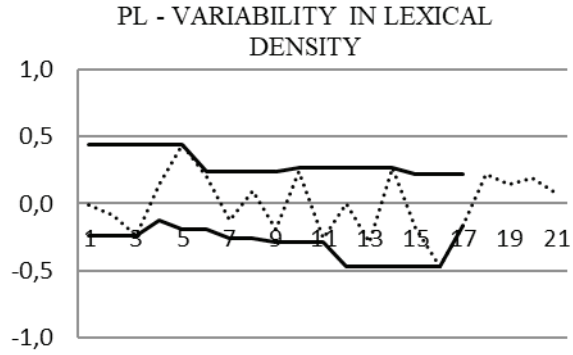

Figure 9.3. PL–variability in lex. density.

In the case of the poor learner, it is rather low, with two periods of moderate variability (tests 1–5 and 11–16) (Figure 9.3). Such a stable variability pattern indicates little change in the subsystem and the allocation of cognitive resources to a different language subsystem.

The patterns of intra-individual variability in the development of lexical sophistication in speaking English depict a period of high variability (tests 2–6) before a period of stability (tests 7–12), followed by moderate variability (tests 13–21) in the case of the good learner (Figure 10.1). In the case of the average learner, the pattern illustrates two periods of variability (tests 1–8 and 10–21), the second one being greater (Figure 10.2). In the case of the poor learner, the pattern reveals low variability in the first half (tests 1–9), followed by high variability in the second half (tests 10–21) of the observation period (Figure 10.3).

The patterns of intra-individual variability in the development of words which belong to the first frequency band, that is, the first 1,000 words, may be described as rather stable patterns of moderate variability. Such variability can be observed especially in such periods as tests 10–14 in the case of the good learner, tests 1–8 and 10–21 in the case of the average learner, and tests 1–5 and 10–14 in the case of the poor learner (Figures 11.1, 11.2, and 11.3).

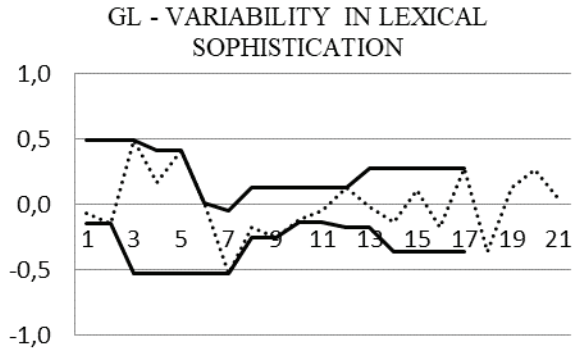

Figure 10.1. GL–variability in lexical sophistication.

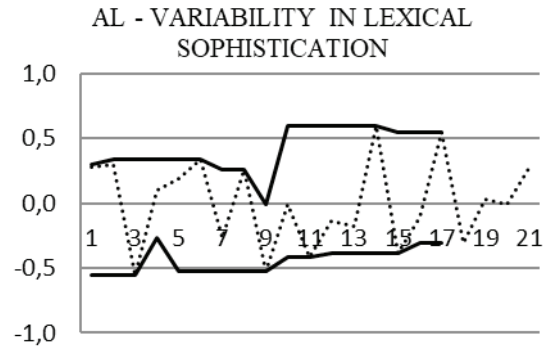

Figure 10.2. AL–variability in lexical sophistication.

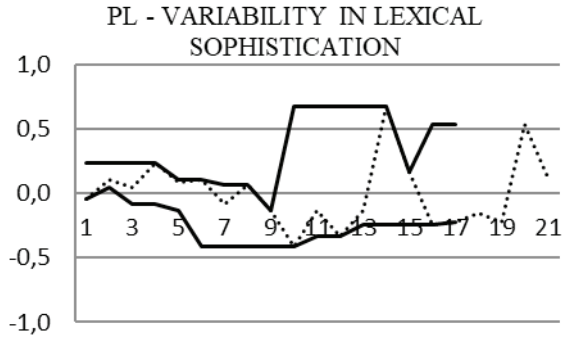

Figure 10.3. PL–variability in lexical sophistication.

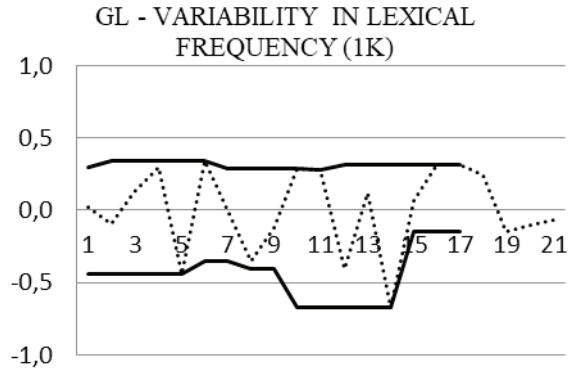

Figure 11.1. GL–variability in lex. freq. (1K).

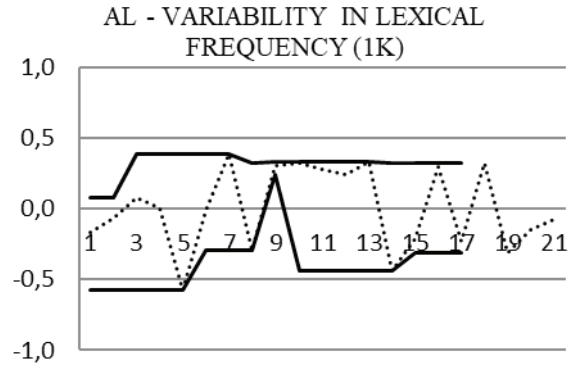

Figure 11.2. AL–variability in lex. freq. (1K).

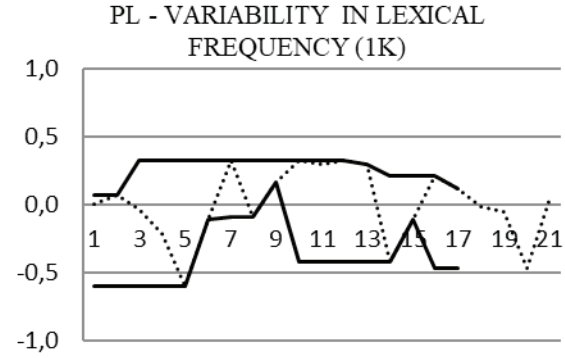

Figure 11.3. PL–variability in lex. freq. (1K).

The patterns of intra-individual variability in the development of words which belong to the second frequency band, that is, the second 1,000 words, clearly show two periods of high variability in the case of the good (tests 3–8 and 10–14) and average learner (tests 1–8 and 10–16) (Figures 12.1

and 12.2). In the case of the poor learner, variability is high at the beginning (tests 1–5) and then low till the end of the observation period (Figure 12.3).

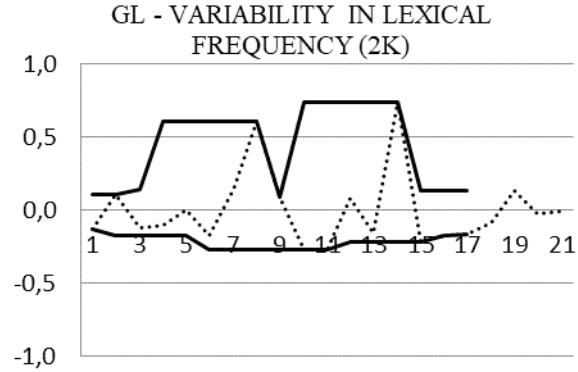

Figure 12.1. GL–variability in lex. freq. (2K).

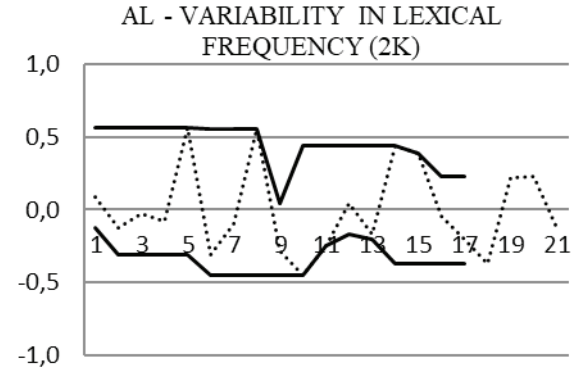

Figure 12.2. AL–variability in lex. freq. (2K).

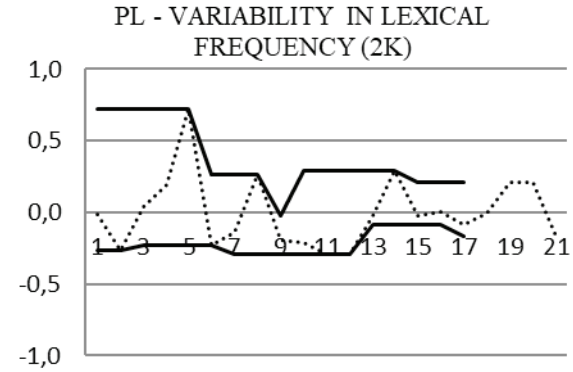

Figure 12.3. PL–variability in lex. freq. (2K).

The patterns of intra-individual variability in the development of words which belong to the third frequency band, that is, the third 1,000 words, show rather high variability throughout the whole observation period in the case of the good learner. In the case of the average and poor learner, variability is low for the major part of the observation period (AL—tests 1–13; PL—tests 1–16) but high towards the end (AL—tests 14–21; PL—tests 16–21).

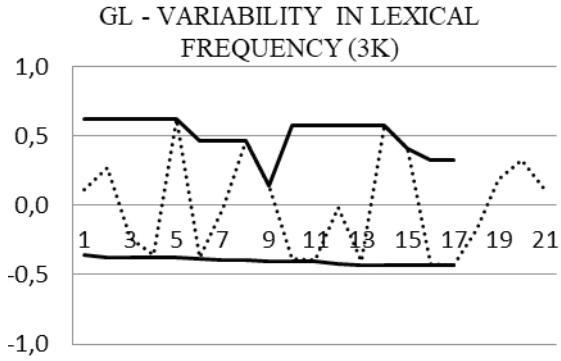

Figure 13.1. GL–variability in lex. freq. (3K).

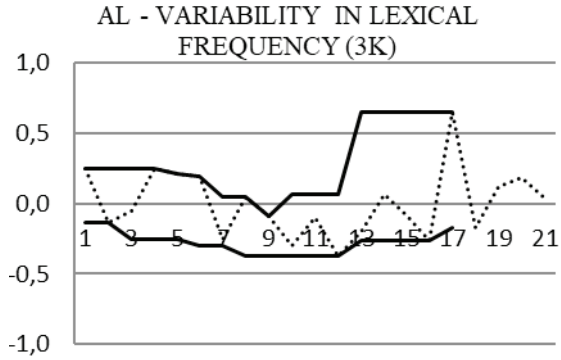

Figure 13.2. AL–variability in lex. freq. (3K).

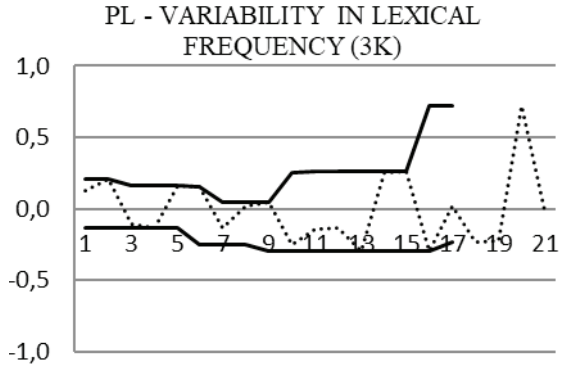

Figure 13.3. PL–variability in lex. freq. (3K).

The patterns of intra-individual variability in the development of words which are off the list, that is, beyond the first 3,000 words, in the case of the good learner, show a period of high variability (tests 8–12) which is preceded and followed by the periods of low variability (tests 1–7 and 13–21) (Figure 14.1). In the case of the average learner, a rather stable pattern of low variability can be observed, indicating little activity in the language subsystem and a focus on a different part of language system (Figure 14.2). In the case of the poor learner, the initial period of higher variability (tests 1–6) is followed by a short period of low variability (tests 7–9) and a rather stable period of moderate variability (tests 10–21) (Figure 14.3).

Notwithstanding the analysed patterns of intra-individual variability in the development of lexical complexity and frequency, a Monte Carlo Analysis proves that the differences between the good, average, and poor learner in these aspects are statistically insignificant, except the differences between the good and average learner in lexical sophistication and the off-list vocabulary (Table 5).

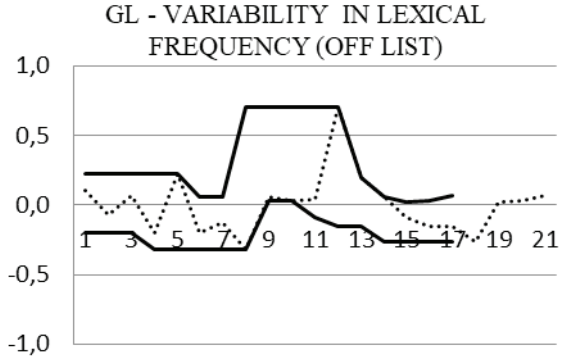

Figure 14.1. GL–variability in lexical freq. (OFF LIST).

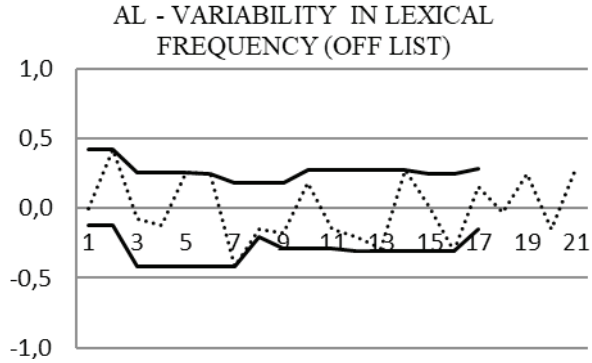

Figure 14.2. AL–variability in lexical freq. (OFF LIST).

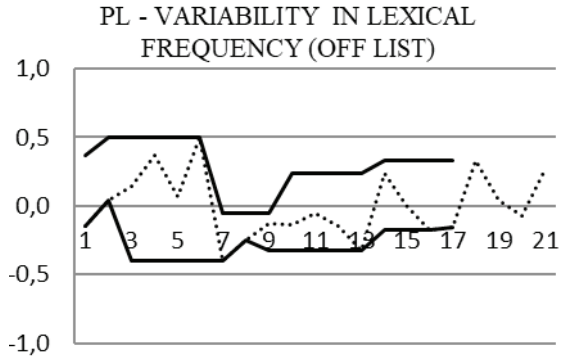

Figure 14.3. PL–variability in lexical freq. (OFF LIST).

Table 5

Intra-individual variability in lexical complexity—a Monte Carlo Analysis (p<0.05)

Data	Intra-individual variability in lexical complexity						
	LEX. SOPH.	LEX. DENS	LEX. VAR.	FREQ. (1K)	FREQ. (2K)	FREQ. (3K)	FREQ. OFF LIST
GL&AL	.025	.660	.000	.527	.196	.935	.050
GL&PL	.693	.000	.000	.871	.609	.945	.238
AL&PL	.987	.790	.000	.874	.881	.582	.783

Finally, the relationship between the learners' rate of development and intra-individual variability in the emergence of various measures of lexical complexity, calculated in terms of Spearman's *rho* values, is weak, positive, and statistically significant for all learners (.7726) (Table 5). However, looking at individual results, the above is true in the case of the average (.7357) and poor (.7404) learner but not in the case of the good learner, whose result (*–.1139) is statistically insignificant.

Table 6

The rate of development and intra-individual variability in lexical complexity—correlation

The rate of development & intra-individual variability in the development of lexical complexity			
Good learner	Average learner	Poor learner	All learners
*–.1139	.7357	.7404	.7726

Discussion

The aim of the present study was to investigate the role intra-individual variability in the emergence of lexical complexity in speaking English as a foreign language at secondary school in the case of a good, average, and poor language learner. With respect to the development of different measures of lexical complexity, it is observed that lexical variation in the language produced in speech by the good learner was higher than in the case of the average learner and poor learner between whom, in turn, no difference has been found. At the same time, however, the good learner's speech was characterised with the same level of lexical density and sophistication as the average learner's and the poor learner's speech. What is more, the learners' lexical profiles did not differ statistically. All three learners used mainly the most frequent words (1,000 words) while speaking English, using only a few percent of words which belong to the second and third 1,000 words, the same being true for words off the list. On the one hand, it is rather surprising to find out that the learners can talk about such a variety of topics mainly on the basis of the first 1,000 words in English, but on the other, it is well-established that the use of vocabulary in spontaneous interaction is a sophisticated process in which L2 learners tend to rely on early acquired, easily accessible language material. What is more, such use of lexis may be indicative of the gap between recognition and production of lexis as well as between the use of lexis in controlled and free production (Laufer, 1998; Schmitt & Meara, 1997, Laufer & Goldstein 2004).

Based on the visual data analysis, it may be said that in line with the CDST framework the learners' learning trajectories in the development of lexis are individual but the differences are more visible in the case of lexical sophistication and higher frequency bands than in the case of variation, density, and the first frequency band. These findings are to some extent reflected in the patterns of intra-individual variability. In general, shorter and longer periods of lesser and greater variability seem to appear at different times in lexical development of all three learners. However, the patterns of intra-individual variability among the three learners appear to be more similar with reference to lexical variation, density, and the first frequency band but not sophistication and the remaining frequency bands. What is more, the good learner's variability patterns often include periods of rather high variability which contrast with the average learner's and poor learner's periods of low variability. In line with the CDST framework, this indicates some activity and change in the system in the case of the former, and lack of activity and development in the case of the latter. Despite the fact that some qualitative differences may be detected in the learners' intra-individual variability on the basis of advanced visualisation

techniques, from the statistical point of view, most of the patterns analysed are not meaningful. However, it is necessary to verify these findings on a bigger sample of learners.

As far as the relationship between the learners' level of intra-individual variability and the rate of development of lexical complexity is concerned, it has been generally found out that there exists a weak and positive relationship between the two variables. It needs to be pointed out that such a relationship may vary in different language sub-systems and in the case of individual learners. Although this preliminary finding seems to indicate some support for the claim that intra-individual variability has a positive influence on language development, it should constitute the basis for a larger-scale research.

Conclusions

Summarising, it is important to reiterate that Complex Dynamic Systems Theory (CDST) acknowledges a dynamic, non-linear and highly variable nature of the development of complex and interactive language subsystems. CDST researchers claim that intra-individual variability has a positive influence on language development and that it should be studied with respect to whole language subsystems by means of a number of specific tools and procedures, which should lead to new insights in second language development. The third part of the case study presented in this paper, which focuses on intra-individual variability in lexical complexity, yields a more comprehensive picture of the role of this phenomenon in language development of the good, average, and poor learner. In contrast to the first two parts of the case study (Rokoszewska, 2019a & 2019b), which showed that the language produced by the good learner was better than the language of the average and poor learner in terms of complexity, accuracy, fluency and most measures of syntactic complexity, the third part of the study showed that, as far as lexical complexity is concerned, the language of all three learners was the same in terms of almost all lexical measures. This shows that the learners were as if more preoccupied with the development of other language sub-systems than lexical complexity. As the first part of the case study showed (Rokoszewska, 2019a), the good learner developed syntactic complexity, fluency, and accuracy at the cost of lexical complexity. The average learner developed accuracy at the cost of fluency and both syntactic and lexical complexity. The poor learner developed his syntactic complexity and fluency more than lexical complexity but at the cost of accuracy. Thus, the third part of the case study points to the

need and challenge to help learners use lexically denser, more sophisticated and more varied language while communicating in a foreign language. Like the first two parts of the case study, this part renders some support for the existence of individual learning trajectories, apparently different periods of high and low variability occurring at different times whose patterns do not have to be meaningful but random, and for the fact that, in general, the level of intra-individual variability might indeed influence learners' development of lexical complexity. Nevertheless, these qualitative empirical findings should be quantitatively verified on a bigger sample of learners, which would render a more comprehensive picture of group and individual lexical behaviour.

References

Ai, H., & Lu, X. (2010). A web-based system for automatic measurement of lexical complexity. Paper presented at the 27th Annual Symposium of the Computer-Assisted Language Consortium (CALICO-10). Amherst, MA. June 8–12.

Bailey, C. (1973). *Variation and linguistic theory.* Washington, D.C.: Centre for Applied Linguistics.

Bickerton, D. (1975). *Dynamics of a creole system.* Cambridge: Cambridge UniversityPress.

Cancino, H., Rosansky, E., & Schumann, J. (1978). The acquisition of English negatives and interrogatives by native Spanish speakers. In E. M. Hatch (Ed.), *Second language acquisition: A book of readings* (pp. 207–230). Rowley, MA: Newbury House.

Chomsky, N. (1965). *Aspects of the theory of syntax*. Cambridge, MA: The MIT Press.

Cobb, T. *Compleat Web VP v. 2* [computer programme]. Accessed: April 24, 2018. Retrieved from: https://www.lextutor.ca/vp/

Crystal, D. (1982). *Profiling linguistic disability.* London: Edward Arnold.

De Bot, K. (1992). A bilingual production model: Levelt's "Speaking" model adapted. *Applied Linguistics, 13*, 1–24.

De Bot, K. (2017). Complexity Theory and Dynamic Systems Theory: Same or different? In L. Ortega & Z. Han (Eds.), *Complexity Theory and language development. In celebration of Diane Larsen-Freeman* (pp. 51–58). Amsterdam: John Benjamins Publishing Company.

Decamp, D. (1971). Implicational scales and sociolinguistic linearity. *Linguistics, 13*, 30–43.

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

Ellis, R., & Barkhuizen, G. (2005). *Analysing learner language*. Oxford: Oxford University Press.

Gatbonton, E. (1978). Patterned phonetic variability in second language speech: A gradual diffusion model. *Canadian Modern Language Review, 34*, 335–347.

Hymes, D. (1971). *On communicative competence.* Philadelphia, PA: University of Pennsylvania Press.

Kowal, I. (2016). *The dynamics of complexity, accuracy and fluency in second language development*. Kraków: Jagiellonian University Press.

Labov, W. (1970). The study of language in its social context. *Studium Generale, 23,* 30–87.

Laufer, B. (1998). The development of passive and active vocabulary in a second language: Same or different. *Applied Linguistics, 19*, 255–271.

Laufer, B., & Nation, P. (1995). Vocabulary size and use: Lexical richness in L2 written production. *Applied Linguistics, 16*, 307–322.

Laufer, B., & Goldstein, Z. (2004). Testing vocabulary knowledge: Size, strength, and computer adaptiveness. *Language Learning, 54*, 399–436.

Larsen-Freeman, D. (2006). The emergence of complexity, fluency and accuracy in the oral and written production of five Chinese learners of English. *Applied Linguistics, 27*, 590–616.

Larsen-Freeman, D., & Cameron, L. (2008). *Complex systems and applied linguistics.* Oxford: Oxford University Press.

Levelt, W. (1989). *Speaking: From intention to articulation*. Cambridge: Cambridge University Press.

Lu, X. (2012). The relationship of lexical richness to the quality of ESL learners' oral narratives. *The Modern Language Journal, 96*(2), 190–208.

Malvern, D., Richards B., Chipere, N., & Duran, P. (2004). *Lexical diversity and language development: Qunatification and assessment*. Houndmills: Pelgrave MacMillan.

Ochs, E. (1979). Planned and unplanned discourse. In T. Givon (Ed.), *Syntax and semantics, Vol. 12: Discourse and semantics.* New York: Academic Press.

Pfenniger, S. (2019). Non-systematic variation as a driving force in language acquisition (and change). Paper presented at the 31st International Conference on Foreign and Second Language Acquisition (ICFSLA), Szczyrk, Poland.

Read, J. (2000). *Assessing vocabulary*. Oxford: Oxford University Press.

Rokoszewska, K. (2019a). Intra-individual variability in the emergence of complexity, accuracy and fluency in speaking English at secondary school—A case study of a good, average and poor language learner. *Anglica Wratislaviensia, LVII*, 181–204.

Rokoszewska, K. (2019b). Intra-individual variability in the emergence of syntactic complexity in English L2 speech at secondary school—A case study of a good, average and poor language learner. *Konińskie Studia Językowe, 7*(4), 445–473.

Schmid, M., Verspoor, M., & MacWhinney, B. (2011). Coding and extracting data. In: M. Verspoor, K. de Bot, & W. Lowie (Eds.), *A dynamic approach to second language development* (pp. 39–54). Amsterdam: John Benjamins Publishing Company.

Schmitt, N., & Meara, P. (1997). Researching vocabulary through a word knowledge framework. *Studies in Second Language Acquisition, 19*, 17–36.

Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics, 10*, 209–231.

Siegler, R. S. (2006). Microgenetic analyses of learning. In D. Kuhn & R. S. Siegler (Eds.), *Handbook of child psychology, volume 2: Cognition, perception, and language* (6th ed.) (pp. 464–510). Hoboken, NJ: Wiley and Sons.

Spoleman, M., & Verspoor, M. (2010). Dynamic patterns in development of accuracy and complexity: A longitudinal case study in the acquisition of Finnish. *Applied Linguistics, 31*, 532–553.

Tarone, E. (1983). On the variability of interlanguage systems. *Applied Linguistics, 4*(2), 143–163.

Thelen, E., & Smith, L. B. (1994). *A dynamic systems approach to the development of cognition and action.* Cambridge, MA: The MIT Press.

Ure, J. (1971). Lexical density: A computational technique and some findings. In M. Coultard (Ed.), *Talking about text* (pp. 24–48). Birmingham: English Language Research, University of Birmingham.

Van Dijk, M., Verspoor, M., & Lowie, W. (2011). Variability and DST. In M. Verspoor, K. de Bot, & W. Lowie (Eds.), *A dynamic approach to second language development* (pp. 55–84). Amsterdam: John Benjamins Publishing Company.

Van Geert, P., & van Dijk, M. (2002). Focus on variability: New tools to study intra-individual variability in developmental data. *Infant Behaviour and Development, 25*, 340–375.

Verspoor, M., Lowie, W., & van Dijk, M. (2008). Variability in second language development from a dynamic systems perspective. *Modern Language Journal, 92*, 214–231.

Verspoor, M., de Bot, K., & Lowie, W. (2011). *A dynamic approach to second language development.* Amsterdam: John Benjamins Publishing Company.

Verspoor, M., Lowie, W., van Geert, P., van Dijk, M., & Schmid, M. S. (2011). How to sections. In M. Verspoor, K. de Bot, & W. Lowie (Eds.), *A dynamic approach to second language development* (pp. 129–199). Amsterdam: John Benjamins Publishing Company.

Wolfe-Quintero, K., Ingaki, S., & Kim, H.-Y. (1998). Second language development in writing: Measures of fluency, accuracy, and complexity (Report No. 17). Honolulu: University of Hawaii, Second Language Curriculum Centre.

Appendix

Sample texts produced by a good, average and poor learner in speech (Test 2)

A) A GOOD LEARNER: I use the computer for search different information, to surf the net. And I think it is very useful invention because for example when I do not have enough time to search different information in books or something like that, I can find every single information in the Internet. And it does not take much time to find it. I use the computer for listening and downloading music because music is my real passion and for watching films, also. And I think that the computer is better than TV because I can do everything. And on TV I can only watch films. And when I have connection to the Internet, I can watch films on the Internet. But the computer, I think it is better. I think that the main advantage of mobile phones are that you can use them in every single place because they are small. And you can take them everywhere. It only depends on the signal because there are some places, there are no signal. And you can talk to your friends even when you are away. And also the newest models of the mobile phones have connection to the Internet. You can surf the Net.

B) AN AVERAGE LEARNER: I use computer to surf the Internet make, no, make documents or presentations, sometimes play games. But I usually use computer to, to listen music because I like it. I play games on my computer, on the my computer about twice a week for an hour because it is. But I prefer to program or change settings in my computer. So I am in class with expanded information technologies. I have mobile phone. I always have mobile phone with me because I like call to my friends or parents. It is better than, it is better that when I do not have mobile phone. Also I use my mobile phone to take photos. So I do not need, needed a camera. Sometimes I play games on my mobile phone, too when I am not, when I bored. When I am not, when I am not in school, I surf the Internet for example to check my. Yes, yes, the cons of mobile phone is that it can be stole or lost. And mobile phone needs electromagnetic fields and radiation which it is harmful to our brain and body.

C) A POOR LEARNER: I use my computer for play games, listen to music and watch a video, watch video, yes, no, chat with my friend. And that is it is only. So, a pros is a, take photos, play games and surf the Internet, call, yes. It is emit electromagnetic and a. Yes, and a money for my mobile phone is a expensive. It is all. A signal is a good. It is a pros, yes, pros. A battery on a smartphone, it is a low. So pros Internet is a chat with friends, play online games and listen music and maybe watch a social networking sites. Yes, hackers, cybercriminals and it is a little dangerous because they does not they do not know who watch this photo, yes, yes, no, only pros. We can use a information on the sites and learn. No, I do not know. I think the life with no mobile phones and computer is a boring or only boring. Yes, because we have a information for mobile phone and computers. And if we do not have this this electrical, electrical items, we do not have this information. Yes, because we do not play games, listen to music, no.

Table 7

Lexical complexity—a good, average and poor learner (Speaking test 2)

Lexical complexity—a good, average, and poor learner (test 2)								
Data	Words	Density	Sophistication	Variation	Freq. 1k	Freq. 2k	Freq. 3k	Fr. off-list
GL	200	0.45	0.13	5.00	90.0	4.5	3.0	2.5
AL	188	0.47	0.26	4.23	88.8	3.2	1.6	6.4
PL	200	0.48	0.28	3.60	88.5	1.0	5.0	5.5

Katarzyna Rokoszewska

Interne Varianz eines Lernenden im Prozess der Entstehung der lexikalischen Komplexität im Sprechen auf Englisch auf dem Niveau einer Oberschule – Fallstudie eines leistungsguten, -mittleren und -schwachen Lernenden

Zusammenfassung

Die Theorie dynamischer komplexer Systeme befasst sich mit dem Prozess der Entwicklung der Sprache im Kontrast zu ihrer Aneignung. Indem die interne Komplexität des Sprachsystems sowie der dynamische, nichtlineare Charakter der Sprachentwicklung betont werden, zeigt die Theorie eine neue Herangehensweise an die Rolle der Varianz dar, die aus der Entwicklungspsychologie abgeleitet wird. Dieser Ansatz steht im Einklang mit den Ergebnissen der Forschungen der 1980er Jahre, in denen verschiedene Arten und Ursachen der Varianz identifiziert wurden, behandelt jedoch die Varianz als ein für die Sprachentwicklung verantwortlicher Hauptfaktor und nicht als eine periphere Erscheinung. Es wird angenommen, dass sich die interne Varianz eines Lernenden, die als die zwischen wiederholten Messungen bei einzelnen Lernenden beobachteten Unterschiede im Niveau einer bestimmten Entwicklungsvariable definiert wird, auf die Sprachentwicklung auf verschiedenen Ebenen der Sprachbeherrschung positiv auswirkt. Nach der Durchführung der ersten beiden Teile einer Fallstudie, die auf dem mündlichen Sprachkorpus eines Lernenden beruhte, die der internen Varianz in Bezug auf die sprachliche Komplexität, Korrektheit, Flüssigkeit und insbesondere auf die syntaktische Komplexität gewidmet waren, beschreibt dieser Artikel den dritten Teil

der oben genannten Studie, die darauf abzielt, dieses Phänomen im Prozess der Entstehung der lexikalischen Komplexität im Sprechen auf Englisch als Fremdsprache auf dem Niveau einer Oberschule am Beispiel eines leistungsguten, -mittleren und -schwachen Lernenden zu analysieren. Im Allgemeinen zeigen die Ergebnisse der Studie statistisch signifikante Unterschiede unter Lernenden in der lexikalischen Differenzierung im Kontrast zur lexikalischen Dichte, Komplexität oder Häufigkeit, sie zeigen dennoch keine solchen Unterschiede in der internen Varianz eines Lernenden, wobei auf eine schwache positive Beziehung zwischen dieser Varianzart und dem Tempo der lexikalischen Entwicklung hingewiesen wird.

Schlüsselwörter: Theorie dynamischer komplexer Systeme (CDST), lexikalische Komplexität, lexikalische Differenzierung, Korpus eines Lernenden, Sprechen