Complexity, Fluency, and Accuracy in Written Works of Vietnamese Learners of English: A Replication Study

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ABSTRACT

Recent studies applying Dynamic Systems Theory (DST) have shown language acquisition's non-linear, indiscrete, chaotic, and highly context-dependent nature. However, limited research has explored these dynamics in English as a Foreign Language (EFL) context. To evaluate DST's applicability in EFL settings, this study partially replicates Larsen-Freeman's (2006) investigation by tracking the language development of four upper-intermediate Vietnamese EFL learners. The study employed the Dynamic Description approach, in which the participants were required to take written tests every three weeks over three months. Their performance across four dimensions - accuracy, fluency, lexical complexity, and syntactic complexity- was examined through both quantitative and qualitative analyses. Although the findings revealed similarities with the original study, the learners' development trajectories differed, proving that the learners were interacting with their surrounding EFL context. These findings underscore the significance of learning contexts on language acquisition and offer valuable insights into more context-sensitive teaching practices.

Introduction

Traditionally, Second Language Acquisition (SLA) has been viewed as a stage-like, discrete, and linear process, mainly cognitive in nature (Larsen-Freeman, 2006). Influential theories, such as Krashen's *Natural Order Hypothesis* (1982) and McLaughlin et al.'s *Information Processing model* (1983), suggest that language learning progress traverses through separate stages in a consistent manner. However, Dynamic Systems Theory (DST) challenges these notions. Research grounded in the DST framework reveals that learners' linguistic growth is not consistent but rather intertwined and dynamic, shaped by continuous interaction among various elements such as learners' environments, personal motivations, and access to linguistic input

(Larsen-Freeman, 2006; de Bot et al., 2007; Verspoor et al., 2008; Caspi, 2010; de Bot & Larsen-Freeman, 2011).

However, much of the research in this area, including Larsen-Freeman's (2006) – one of the pioneering studies – was primarily conducted in an English as a Second Language (ESL) context, where learners have greater exposure to the target language in their daily lives. In contrast, English as a Foreign Language (EFL) learners typically encounter English primarily in formal instructional settings, making their learning experience distinct. Given that language acquisition is significantly influenced by learners' contexts, objectives, and available input, it is essential to question whether DST findings from an ESL environment can be generalized to EFL learners.

This research explores the reliability and generalisability of Larsen-Freeman's (2006) findings within the Vietnamese EFL context by observing language development in the written works of four upper-intermediate learners over a three-month period. By closely comparing the outcomes of the two studies, the present study will highlight both similarities and discrepancies, thereby providing valuable insights into the dynamics of language acquisition in an EFL environment.

Literature review

Definition of Dynamic System

A system can be defined as a collection of elements that function collaboratively. Each system encompasses multiple sub-systems that interact dynamically with each other (Larsen-Freeman, 1997). Besides, the term *dynamic* in DST refers to the ongoing self-organization driven by internal forces and the surrounding environment (de Bot et al., 2013). Generally, a system is considered a complex or dynamic system - these terms are now used interchangeably - if it demonstrates at least three main features. That is, the system (1) comprises a minimum of two sub-systems that are (2) interlinked with each other but which also (3) demonstrate spontaneous, independent self-organization over time. The movement of a double pendulum – the simplest dynamic system – perfectly exemplifies this concept. The double pendulum consists of two sub-systems: the upper and lower limbs (see Figure 1). Movement in the upper limb causes the lower limb to move chaotically, affecting the upper limb's initial motion, leading to a wholly distinct movement for the entire system.

Figure 1.

A double pendulum
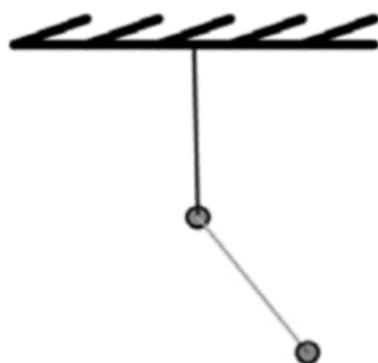
Language as a dynamic system

Larsen-Freeman (1997) argues that language can be explicitly or implicitly perceived as a complex, dynamic system because it exhibits features that are similar to those of dynamic systems. These characteristics include (1) a variety of sub-systems, (2) complete interconnectedness among sub-systems, and (3) autonomous reorganization. To be more precise, language consists of five sub-systems: phonology, morphology, syntax, semantics, and pragmatics, all of which are interdependent (Verspoor et al., 2011) (see Figure 2). For language to function effectively, learners must be able to pronounce words (phonology), associate meanings with those words (morphology), comprehend the meanings of words when combined into sentences (syntax), and grasp how broader non-verbal contexts influence language meaning (pragmatics). Each sub-system varies at different levels depending on internal and external factors (Plotkin, 2006). In summary, DST conceptualizes language as a multidimensional construct that continually reorganizes due to internal changes and contextual adaptations (Morrison, 2006). Consequently, Second Language Acquisition (SLA) is also regarded as a dynamic process (de Bot, 2008).

Figure 2.

The interconnectedness of linguistic sub-systems
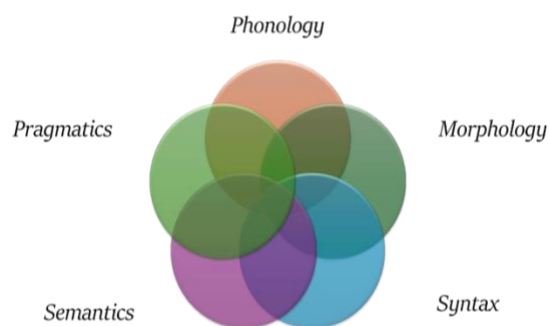
Regardless of being a relatively new concept in SLA, DST has quickly become a leading approach for understanding the intricacies of language development in learners by integrating various aspects of SLA. For instance, Verspoor et al. (2008) tracked individual learners' written development and found that progress across accuracy, fluency, and complexity did not follow a steady trajectory but instead displayed irregular patterns driven by personal learning experiences and external conditions. Huynh (2021) also applied DST to explore foreign language learners' anxiety in online language classrooms, illustrating the dynamism and emergence of factors affecting language learning. Furthermore, by transitioning from linear, straightforward cause-and-effect models to non-linear, holistic frameworks, DST offers robust explanations for complex linguistic phenomena such as the "butterfly effect", explaining why learners exhibit significantly different progress even with similar language input.

Second Language Acquisition in Dynamic System View

In the lens of DST, SLA possesses certain characteristics, which I selectively present below.

The dynamic system exhibits chaotic variation.

As a result of chaotic variation among and within variables, it is impossible to separate the trajectory of complex systems (Verspoor et al., 2011); thus, learners' performance does not adhere to distinct stages. In the DST-based approach, the information processing (see Figure 3) is a complex process, as each stage could chaotically interact with any or all of the other stages. Sometimes, this complexity may involve iterative procedures or breakthroughs among stages (Harshbarger, 2007). For example, the acquisition of a new word does not guarantee its

immediate integration into a learner's cognition; there may be instances of forgetting, necessitating reassignment of meaning. Alternatively, the application of the new word can influence its meaning, either confirming or contradicting the learner's initial understanding. In cases of contradiction, the learner may revise their understanding or temporarily set it aside until further clarification or engagement occurs.

Figure 3.

A dynamic model of information processing (Harshbarger, 2007)
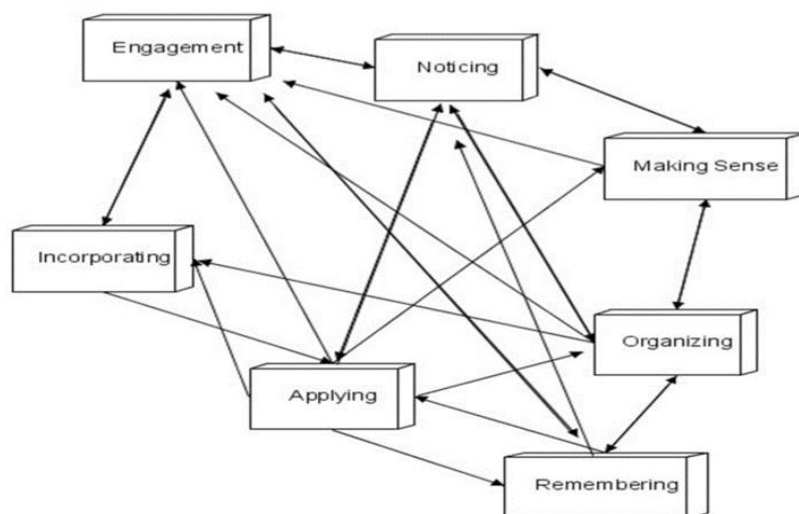

DST is completely interconnected.

In DST, all parts are interconnected, and this applies to language acquisition as well. Phonological, lexical, and syntactic subsystems do not develop separately but are highly interconnected throughout development (see Figure 4); hence, changes in one subsystem influence all others in various ways. An empirical study by Yang and Sun (2015) supports this, revealing that complexity, fluency, and accuracy in language learning are highly interdependent, with progress in one dimension often accompanied by stagnation or regression in another.

Figure 4.

The interconnectedness of linguistic dimensions
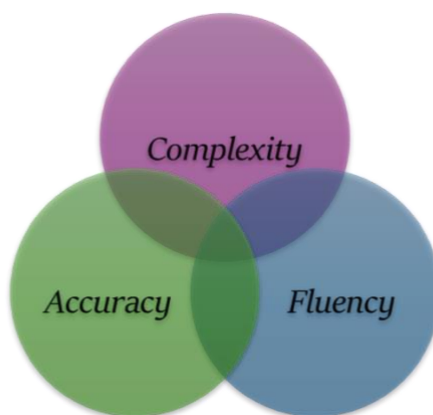
However, language sub-systems and dimensions can interact both competitively and supportively, constrained by limited resources such as time, memory, and attention (Robinson & Mervis, 1998; van Geert & Steenbeek, 2008). In other words, there is constant resource competition among sub-systems and dimensions. For example, improvements in complexity might impede accuracy, as seen in Polat and Kim's (2013) study, where advanced Turkish learners displayed gains in lexical and syntactic complexity but no parallel improvement in accuracy. Similarly, Spoelman and Verspoor (2010) observed a regression in accuracy despite improvements in complexity for Dutch learners.

These findings carry significant implications for language teaching and learning. Given the highly interconnected nature of language, assessing learners' progress solely through a single sub-system is inappropriate because it fails to account for the multifaceted interactions of these systems and dimensions over time (Beckner et al., 2009; Larsen-Freeman, 2006, 2009; Perone & Simmering, 2017). Besides, teachers should anticipate potential trade-offs between different dimensions of language development and tailor instruction that strategically balances these competing demands. By doing so, they can create learning environments that support students in effectively managing these challenges and promoting holistic language growth.

The environment is indispensable.

In the DST view, systems experience changes due to the interconnection among sub-systems and their active responses to the surrounding environments (Lewontin, 2000). In the context of SLA, this implies that learners' learning progress is profoundly influenced by their environment (Verspoor et al., 2008). Provided that a language classroom is an environment, learners' performance will be influenced by various contextual factors such as their teachers' voice, classmates' behavior, space of class, and so forth. In simpler terms, SLA arises from an interplay between cognitive development and environmental factors such as the social background of learners, friendships, experiences, and so forth. All these elements continuously interact to shape language in an individual. In fact, numerous studies have examined the environmental influences on SLA. For instance, Lightbown and Spada (2006) show that language enhancement is greatly influenced by the quality of interaction with teachers, underscoring the significance of a supportive learning environment. Similarly, Kinginger (2008) concludes that learners' engagement with peers and active involvement in social activities outside the classroom substantially contribute to language improvements. Another research that clearly indicates the interplay between cognitive development and environmental factors is that of Norton (2000) on immigrant women learning English in Canada. His research proves social identity and the availability of interactional opportunities within the community can remarkably affect language learning outcomes. In short, from a DST perspective, language cannot be exclusively considered as either a cognitive or sociocultural phenomenon, as neither approach alone fully explains the complexities of language learning.

Dynamic systems develop non-linearly.

The dynamic interplay among a system's internal sub-systems and its surrounding environment contributes to another important feature of complex dynamic systems – nonlinearity in development. Due to the presence of multiple interconnected variables, pinpointing cause and effect within the system becomes unfeasible (Godwin-Jones, 2018). In language learning, learners' enhancement does not follow a linear trajectory where one would sequentially move from one piece of knowledge to another (Kramsch, 2012). Instead, when a learner acquires new

information, this knowledge does not simply integrate into the existing knowledge but disrupts the previous state and restructures the entire system (Verspoor et al., 2011). On account of this complex interaction, SLA does not proceed linearly (Murakami, 2016) but is marked by periods of advancement and setbacks (Larsen-Freeman, 1997). The U-shaped development of learners learning grammatical morphemes introduced by Lightbown (1983) (Figure 5) is a typical image demonstrating this learning progress. In the model illustrating the utilization of the continuous morpheme *-ing*, accuracy is initially high but subsequently undergoes a temporary regression before becoming high again.

Figure 5.

T*he U-shaped development: an example of grammatical morpheme –ing (Lightbown, 1983)*
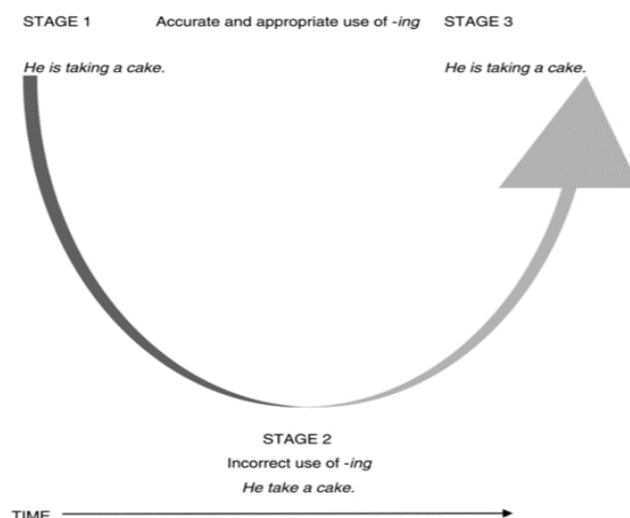
Other researchers have recorded this non-linear pattern in their studies. Nguyen and Pham (2019) found that Vietnamese EFL learners' lexical acquisition exhibited great variability, with periods of impressive progress followed by stagnation or even regression, especially when influenced by external factors, namely academic pressure or limited exposure to authentic language experiences.

There are often multiple routes that are possible among components in dynamic systems.

Complex systems frequently exhibit unpredictable and surprising behaviors among individuals because they consist of numerous dynamic sub-systems (Dörnyei & Murphey, 2003). Furthermore, these sub-systems differ from one another as a result of the complex variations within and around them. A common illustration of this concept is a school of fish. While the group as a whole follows a specific path, each fish swims in its own unique way when observed individually. In terms of SLA, it has been noted that individual differences in motivation, aptitude, cognition, first language (L1), and other factors lead to distinct behaviors, even though the overall group may follow a similar trajectory (de Bot et al., 2007). This intraindividual variability is evident in Larsen-Freeman's (2006) study, which analyzed data from five Chinese participants. She found that although all learners improved in a grand sweep view, each pursued a distinctive developmental pathway.

Research Gap

Despite the fact that Dynamic Systems Theory principles have been studied extensively in language learning, much of the existing research is primarily theoretical, with few empirical studies (Dörnyei et al., 2014). Even when data-driven investigations adopt the DST lens, they often isolate individual characteristics of the theory rather than embracing its holistic view of language learning as a complex, dynamic process (Fischer et al., 2005). This limitation has stimulated demands for more comprehensive emergentism research that studies DST in its entirety rather than in parts. The most thorough analysis of SLA from a complex dynamic perspective is likely provided by Larsen-Freeman (2006), though she is not alone in this endeavor (see de Bot et al., 2005, for example).

However, wholesale studies like Larsen-Freeman's have not been widely applied to the EFL context, where learning environments, interaction nature, surrounding environments, practices, cultural aspects, and so on differ significantly from the ESL context. For instance, unlike ESL learners, Vietnamese EFL learners primarily study English in formal classrooms with minimal exposure to authentic language use outside of school. Moreover, the education system in Vietnam heavily focuses on grammar and reading comprehension, often at the expense of speaking and listening skills. This is further compounded by a curriculum that emphasizes rote learning and test preparation. Thelen and Smith (2006) suggested that the environment is a crucial factor in language acquisition, raising the question of whether Larsen-Freeman's findings apply to both ESL and EFL contexts. The dearth of replication studies to validate existing findings remains a significant gap. These reasons have encouraged me to carry out a replication study in the EFL context (Vietnam), in which I closely mirror Larsen-Freeman's data collection and methodology to assess the reliability and generalisability of her findings.

Research Question

The research aims to address the question below from the aforementioned research gaps and objectives.

To what extent can Larsen-Freeman's (2006) findings be applied in the EFL context?

Methods

Methodology & Participants

When investigating second language acquisition from a dynamic perspective, researchers must focus on three key elements: *time, complexity, and interaction with the environment*. Therefore, I concur with Larsen-Freeman and Cameron (2007) that traditional methodologies that merely capture single points in time are unsuitable. Instead, new approaches are required to evaluate the entire spectrum of learners' linguistic repertoires over time and allow environmental factors to be embodied. Two highly recommended methods to study dynamic systems include Retrodictive Qualitative Modelling (RQM), introduced by Dornyei (2014), and Dynamic Description, proposed by van Gelder and Port (1998). The former approach addresses DST's limited predictability by identifying outcomes and then retrospectively exploring developmental pathways. However, since the focus here is on the learning process rather than outcomes, I decided to opt for The Dynamic Description since it has been proven to be "a general conceptual apparatus for understanding the way systems – including, in particular, non-linear systems – change over time" (van Gelder & Port, 1998, p.17).

This study adopted a longitudinal, time-series design to provide a dynamic description of learner development. As a partial replication of Larsen-Freeman's study, it closely followed her methodology regarding sample size and participants' proficiency. However, unlike the original research, which took place in the United States - an ESL environment, this study was conducted in Vietnam, offering insights into language development in an EFL context. Five upper-intermediate Vietnamese TESOL teachers, aged between 23 and 30, were chosen. They are confidentially referred to by the letters D, T, G, M, and N. T, G, M, and N work part-time in language centers, while D is a full-time high school teacher. Their high level of English proficiency is evidenced by their IELTS certificates, with overall bands ranging from 6.0 to 7.0.

In regard to instruction, the participants took part in a 2.5-hour class on a weekly basis over three months. A communicative book primarily focusing on grammar was used according to the participants' needs. Between classes, they were assigned daily self-study tasks designed to replicate those of the original study. These tasks included textbook homework, 5 minutes devoted to pronunciation practice (i.e., listening to the radio and paying attention to specific words or sounds pronounced differently from how the participants might say), 15 minutes of free reading, and one hour of listening or watching TV to identify new words. The researcher did not grade or regularly monitor the self-study tasks to observe how participants autonomously organized their L2 learning systems. Additionally, it is noteworthy that participants T, G, and M were further participating in IELTS preparation courses for an upcoming re-examination alongside my class.

Regrettably, participant N withdrew from the study after one month and a half, which not only resulted in an interruption to the data collection process but also lost the faithfulness of the sample size to the original study. However, recruiting a replacement was deemed impractical due to time constraints and concerns about introducing systematic differences. Instead, the study proceeded with the remaining participants to maintain research validity and ensure completion within the allotted time frame. Finally, the study has four participants named T, G, D and M.

Data collection

Over three months, once every three weeks, the participants were asked to accomplish the same task: writing narrative stories about a past event without a dictionary consultation. The choice of topic and the length of the narratives were entirely at their discretion, aiming to create natural conditions to accurately assess the learners' development across all linguistic domains. The assessments were untimed, and I did not receive feedback. All participants undertook the initial test after three weeks of instruction. This baseline data diverges from Larsen-Freeman's research, where the initial test was conducted after four months. The modification was made to maintain a comparable number of tests within the study's timeframe.

Data analysis

The four learners' writing was analyzed through quantitative and qualitative methods. This dual data analysis approach helps provide a comprehensive understanding of the changes in learners' language abilities.

Quantitative analysis

In terms of quantitative analysis, the data were analyzed at both macro- and micro-levels. On the macro scale, an overall picture of language improvements in fluency, accuracy, grammatical

complexity, and lexical complexity across four participants was obtained by analyzing their written works which had been segmented into "t-units" - "one main clause with all subordinate clauses attached to it" (Hunt, 1965, p.20). A summary of the language dimensions and the associated measures is provided in Table 1. Subsequently, the mean values for each dimension are graphed on line charts to depict the group's progress over the three-month learning period.

Table 1.

The language dimensions and their measures

Language Dimensions	Measures
Fluency	average number of words per t-unit
Accuracy	the proportion of error-free t-units to t-units
Syntactic Complexity	average number of clauses per t-unit
Lexical Complexity	type-token ratio (the ratio of different words to total words)

On the contrary, the micro level details how each participant's developmental path evolved over time by plotting the four language indices on separate line graphs. Furthermore, to accentuate the intraindividual variations among the learners and facilitate cross-dimensional comparisons, performance measures were transformed into z-scores and represented graphically. This approach made it possible to observe distinct developmental patterns for each learner across different language indices.

Finally, to further consolidate the learners' intraindividual differences, the rate of change over time was also measured. More specifically, to calculate the differences between consecutive tests, the initial test was set as the baseline (assigned a value of 0), then the value of each subsequent test (e.g., test 2) was divided by that of the preceding one, and the number received was the rate of change.

Qualitative analysis

In this analysis, the written products of four participants were broken into idea units—"a message segment consisting of a topic and comment that is separated from contiguous units syntactically or intonationally" (Ellis & Barkhuizen, 2005, p.154). These idea units were then juxtaposed in a table for each participant to observe their narrative construction and change over time.

Research Findings

Quantitative analysis

Group Development

The mean scores across four dimensions of language proficiency - fluency, accuracy, lexical complexity, and syntactic complexity (see Figure 6) - showed overall progress among the participants. However, the development patterns varied across these indices. Fluency showed significant growth, while accuracy initially improved but marginally decreased in the final test.

Syntactic complexity witnessed some fluctuations over time but achieved certain levels of achievement in general. Finally, lexical complexity within the group demonstrated stable progress. Overall, compared to three months ago, participants' writing exhibited greater fluency, accuracy, and complexity in both grammar and vocabulary.

Figure 6.

Group averages (± 1 SD) over time on four indices

Average growth in fluency

Average growth in accuracy
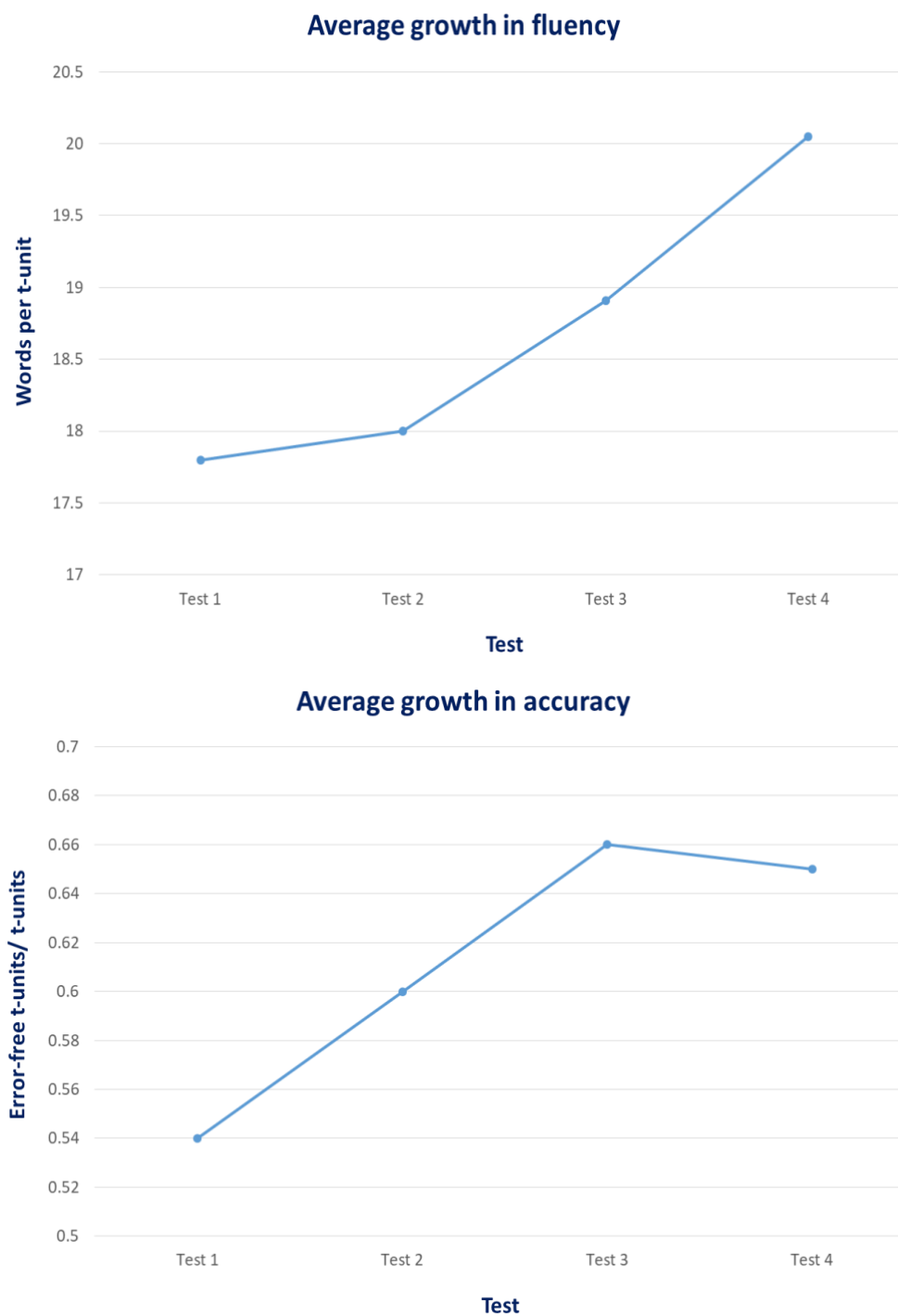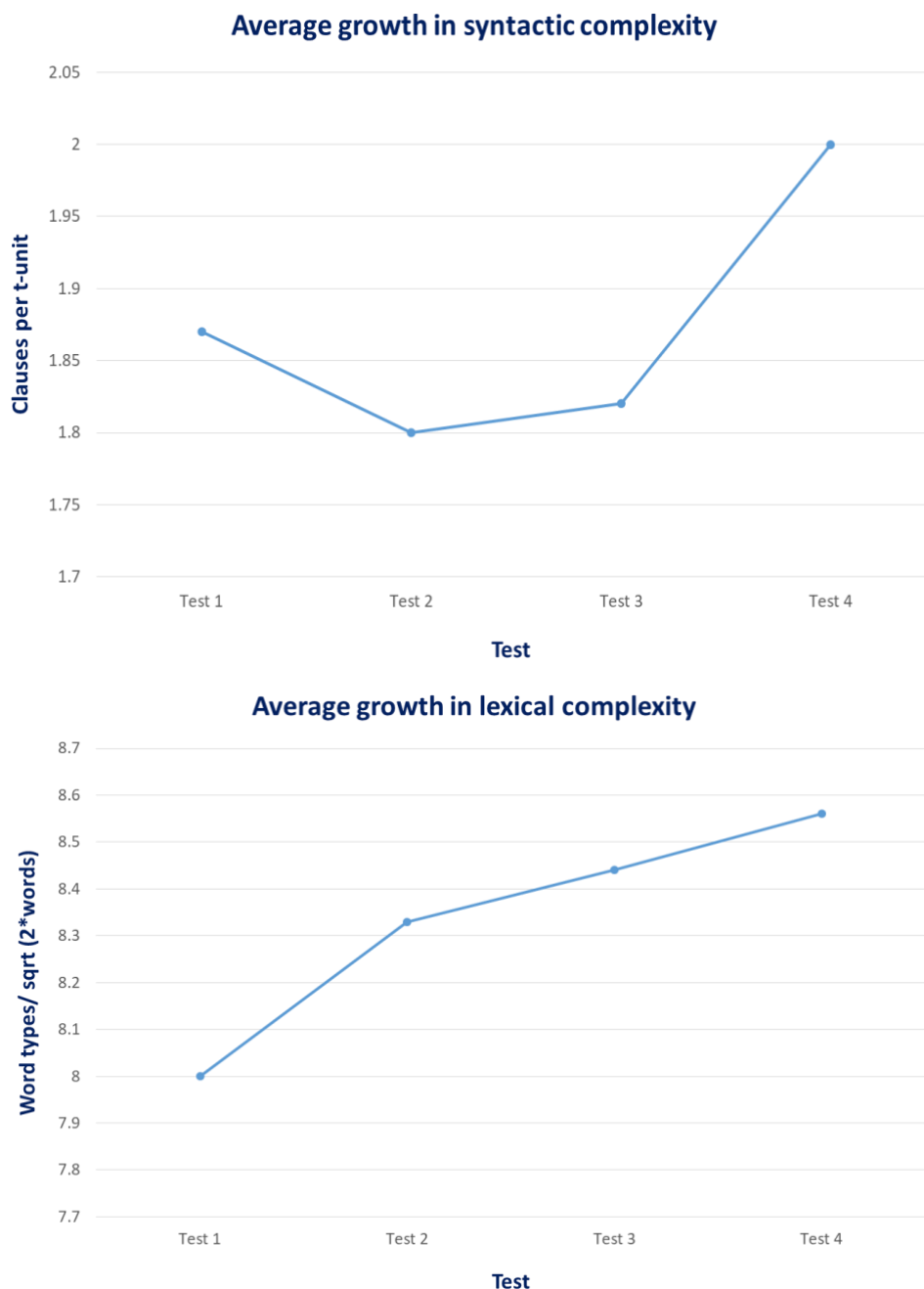
Nonetheless, analyzing data based on group averages solely captures the process or functional relation, leading to a lack of validity for individual variability (Sidman, 1960). Therefore, disaggregating the data would unveil a different perspective on learners' development.

Interindividual variability

When each index is charted individually, a more intricate picture of the developmental paths across the four indices emerges. All line graphs from Figures 7 to 10 describe individual growth patterns across accuracy, fluency, lexical complexity, and syntactic complexity.

Figure 7.

Interindividual growth in fluency over time and the average for four participants

Individual growth in fluency
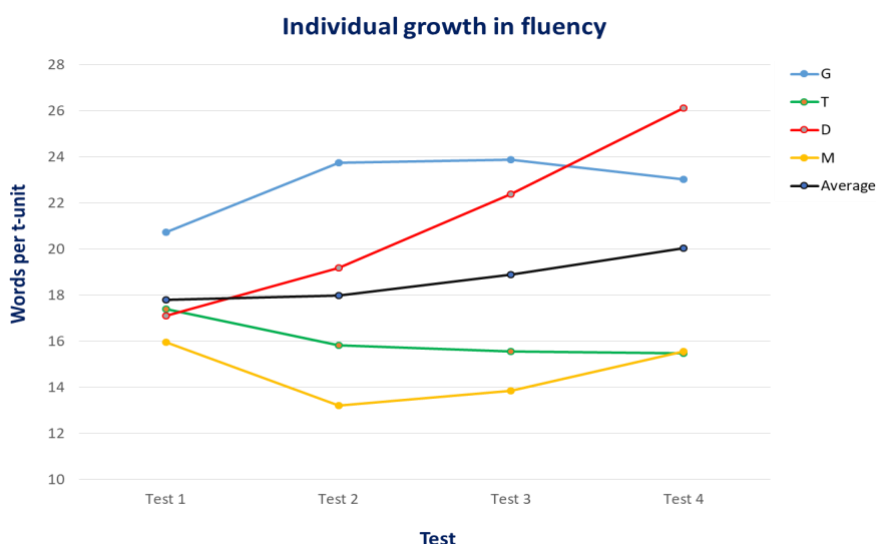
While group averages depicted a relatively smooth upward trend, individual performances were characterized by peaks and valleys. Some exhibited progress, others experienced setbacks, and some remained unchanged after three months. For instance, individual fluency growth indicates that D made significant gains; T's performance gradually declined; while G and M oscillated between advancement and regression.

With regard to accuracy (Figure 8), G, T, and M saw modest variations over the four tests. Although they showed some improvements in accuracy by the end of the study, the changes were unremarkable. Conversely, D's accuracy enhancement fluctuated drastically. Her accuracy decreased modestly in test 2 but surged in test 3 and then declined again in the last test.

Figure 8.

Interindividual growth in accuracy over time and the average for four participants

Individual growth in accuracy
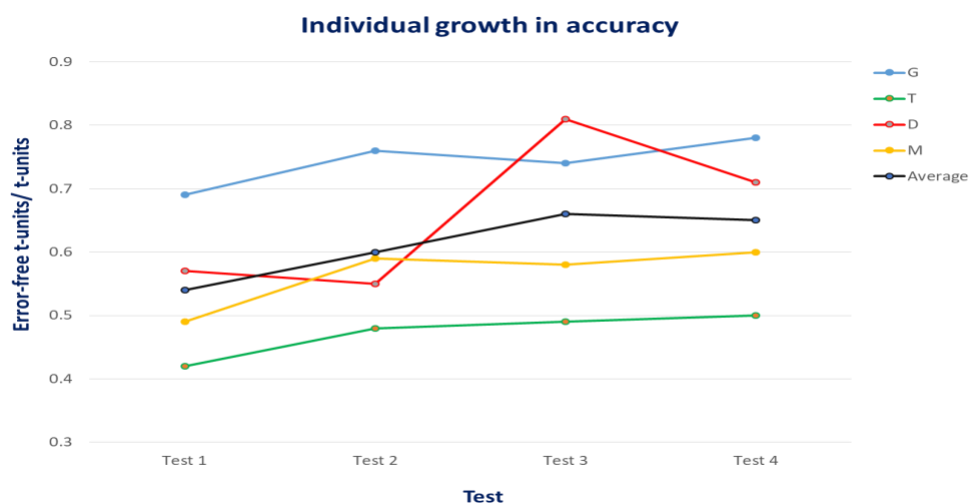
In terms of lexical complexity (Figure 9), participants G, T, and M consistently expanded their vocabulary sizes throughout the tests, whereas D showed a gradual drop over the same period.

Figure 9.

Interindividual growth in lexical complexity over time and the average for four participants

Individual growth in lexical complexity
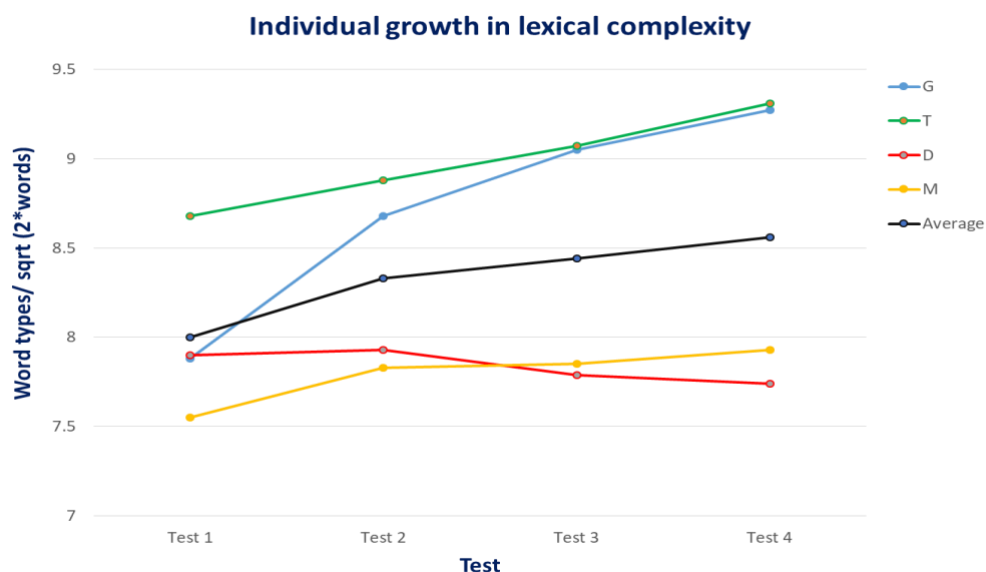
Ultimately, the individual progression in syntactic complexity illustrated in Figure 10 shows that D had a steady upward trajectory, whereas others experienced fluctuating developments. To be more specific, G's grammar advanced in test 2, but T and M did not. However, while G did not show further improvement in subsequent tests, both T and M demonstrated progress.

Figure 10.

Interindividual growth in syntactic complexity over time and the average for four participants

Individual growth in syntactic complexity
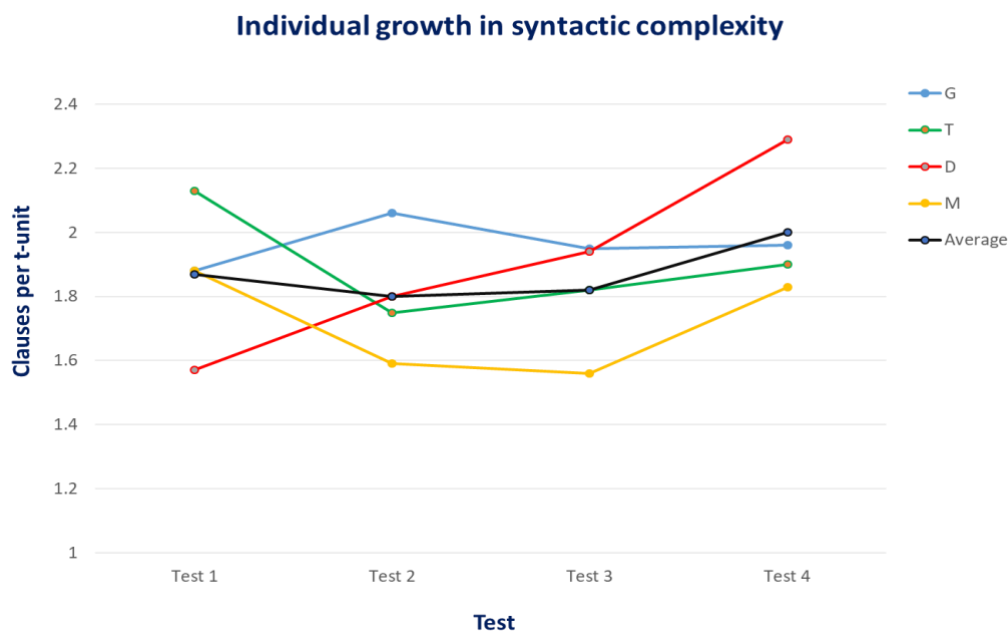
Intraindividual variability

Traditionally, intraindividual variability, which refers to temporary fluctuations among subjects,

has constituted a form to measure errors (Costa et al., 2019). However, from the lens of DST, this within-subject variability serves as a fundamental source of information to illuminate the learners' developmental paths (van Geert & Steenbeek, 2005). To highlight the intraindividual differences between the four learners, all performance measures were converted into z-scores (Figure 11). Since the z-score allows comparability across four language factors, a more accurate portrayal of each learner's progress over time can be captured.

Figure 11.

Intraindividual variation over time for four participants on four indices
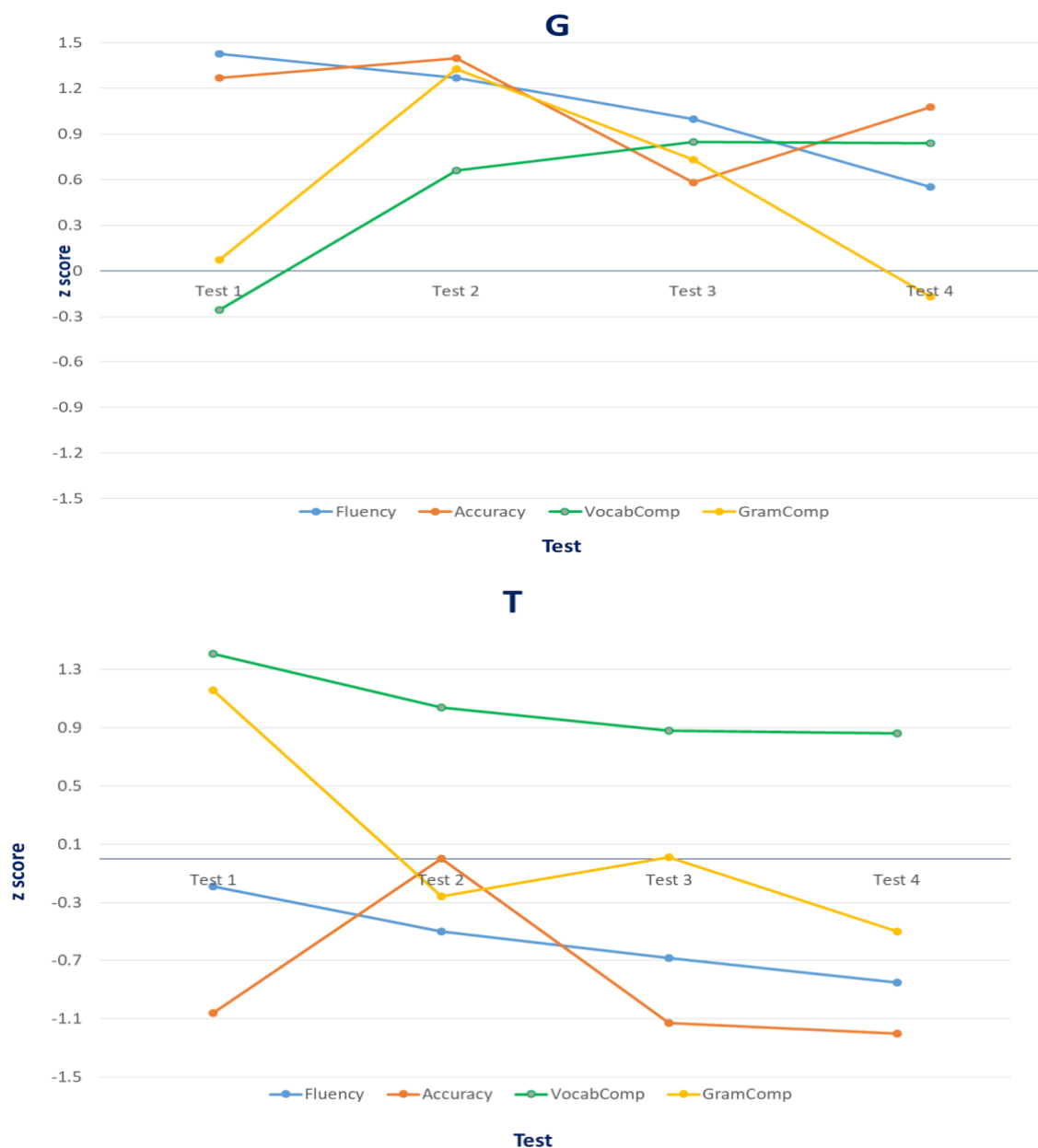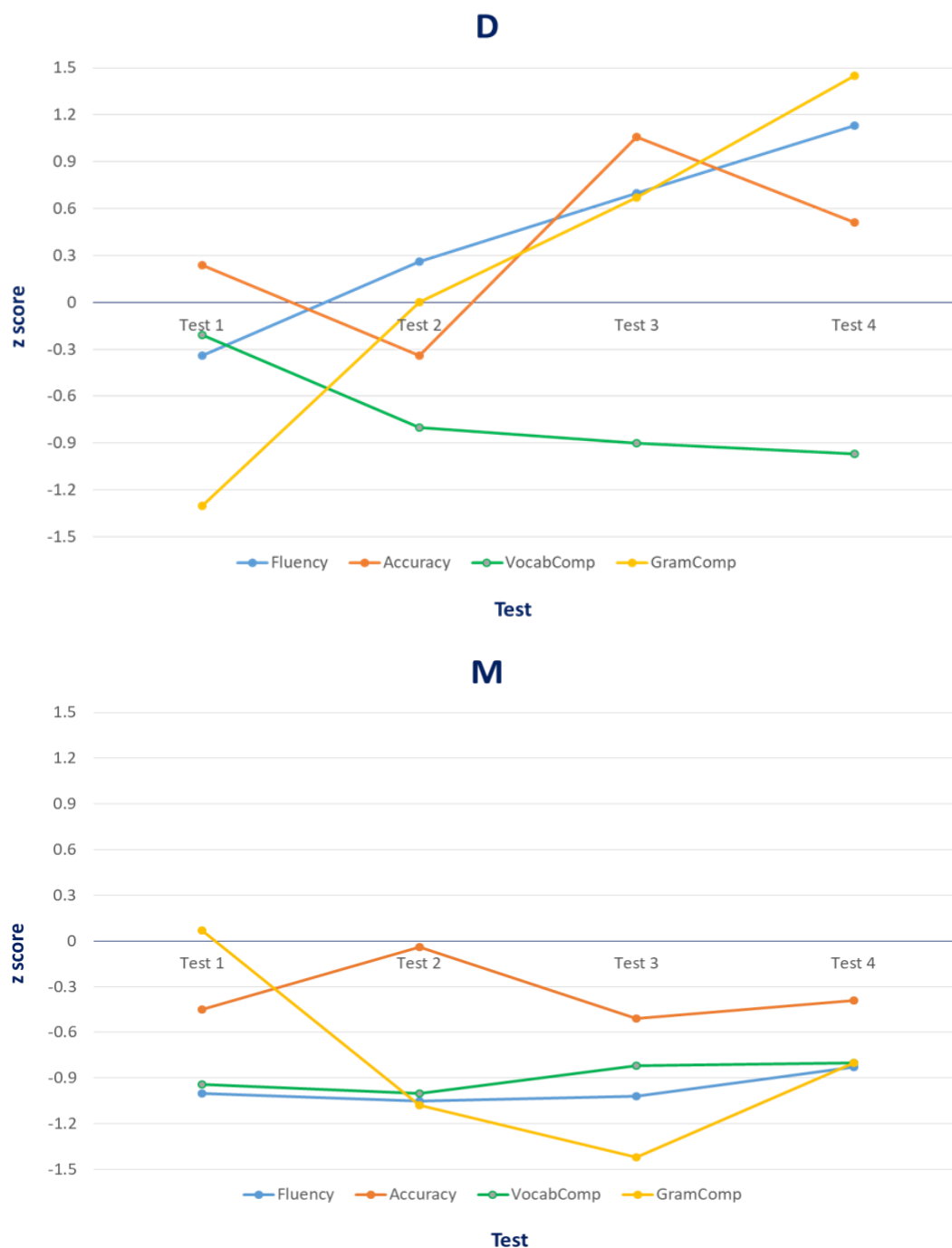
The four line graphs in Figure 11 reveal that each learner's language development pathway is dynamic and complex. Throughout the study time frame, participant G concentrated a great deal on vocabulary, with lexical complexity being the only dimension that progressed. T, on the other hand, experienced a decline across all four indices, particularly in grammar. In contrast, D enhanced in almost every dimension except for vocabulary. Finally, M exhibited no remarkable improvements in any indices. These outcomes proved the learners possess distinct achievement orientations over time.

Two dimensions of the participants' performance - grammatical complexity versus vocabulary

complexity and grammatical complexity versus fluency - are plotted on graphs to obtain more in-depth insights into the individuals' favored developmental paths. The selected indices imitate those used in Larsen-Freeman's (2006) research. Figure 12, comparing the progression of grammar and vocabulary among four participants over the three-month period, shows that G, T, and M made strides in lexical complexity, with G demonstrating particularly notable improvement, while D focused more on enhancing syntactic complexity.

Figure 12.

Change of grammatical complexity compared with vocabulary complexity for four participants
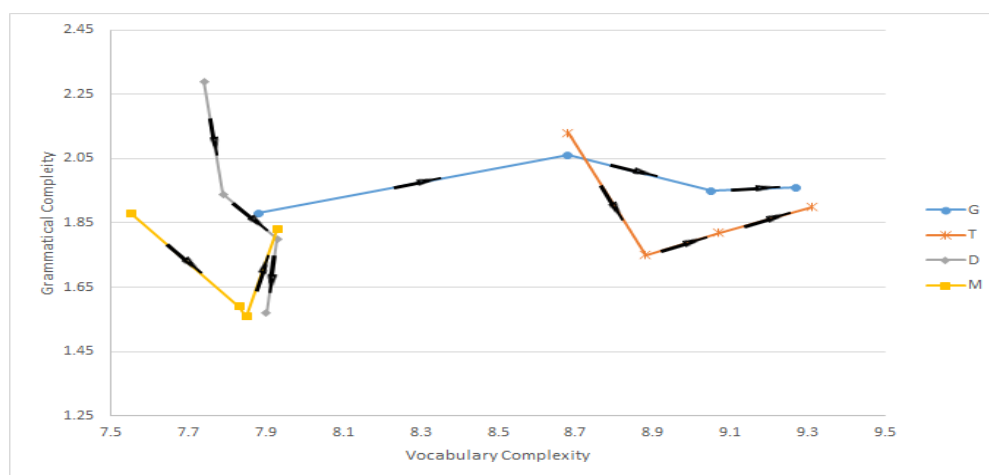
Simultaneously, when graphing grammatical complexity against fluency, participant G made significant progress in grammar, whereas the others fell somewhere between these two dimensions (Figure 13).

Figure 13.

Change of grammatical complexity compared with fluency for four participants
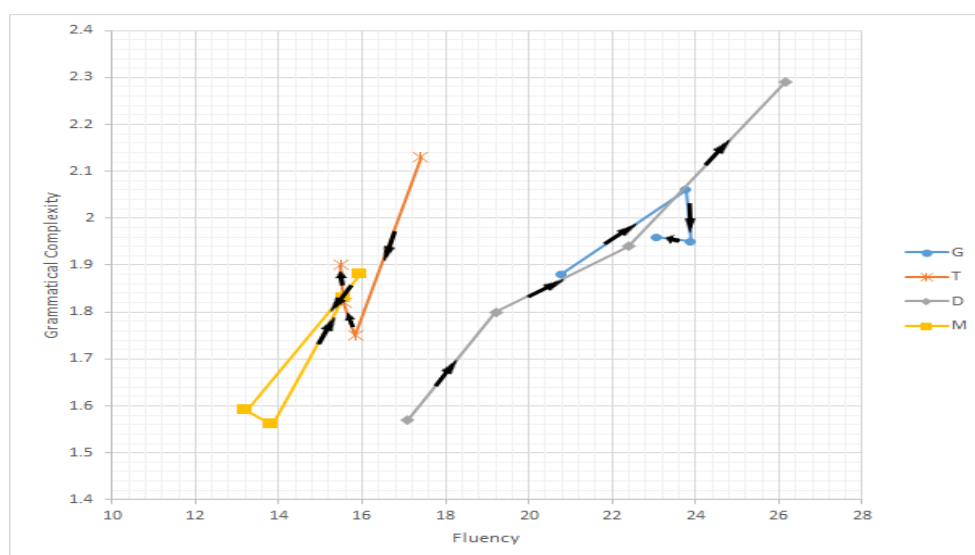
The rate of change fluctuated unevenly among the four participants (see Figure 14), highlighting

the individual differences in language development. To be more precise, both G and T's growths were gradual across all indices, yet T's syntactic complexity rose faster. In contrast, D and M exhibited a swift increase in accuracy but slower in lexical complexity. Overall, the most substantial rate of change occurred in accuracy, whereas vocabulary complexity had the slowest progression.

Figure 14.

Rate of change in four indices for four participants over time
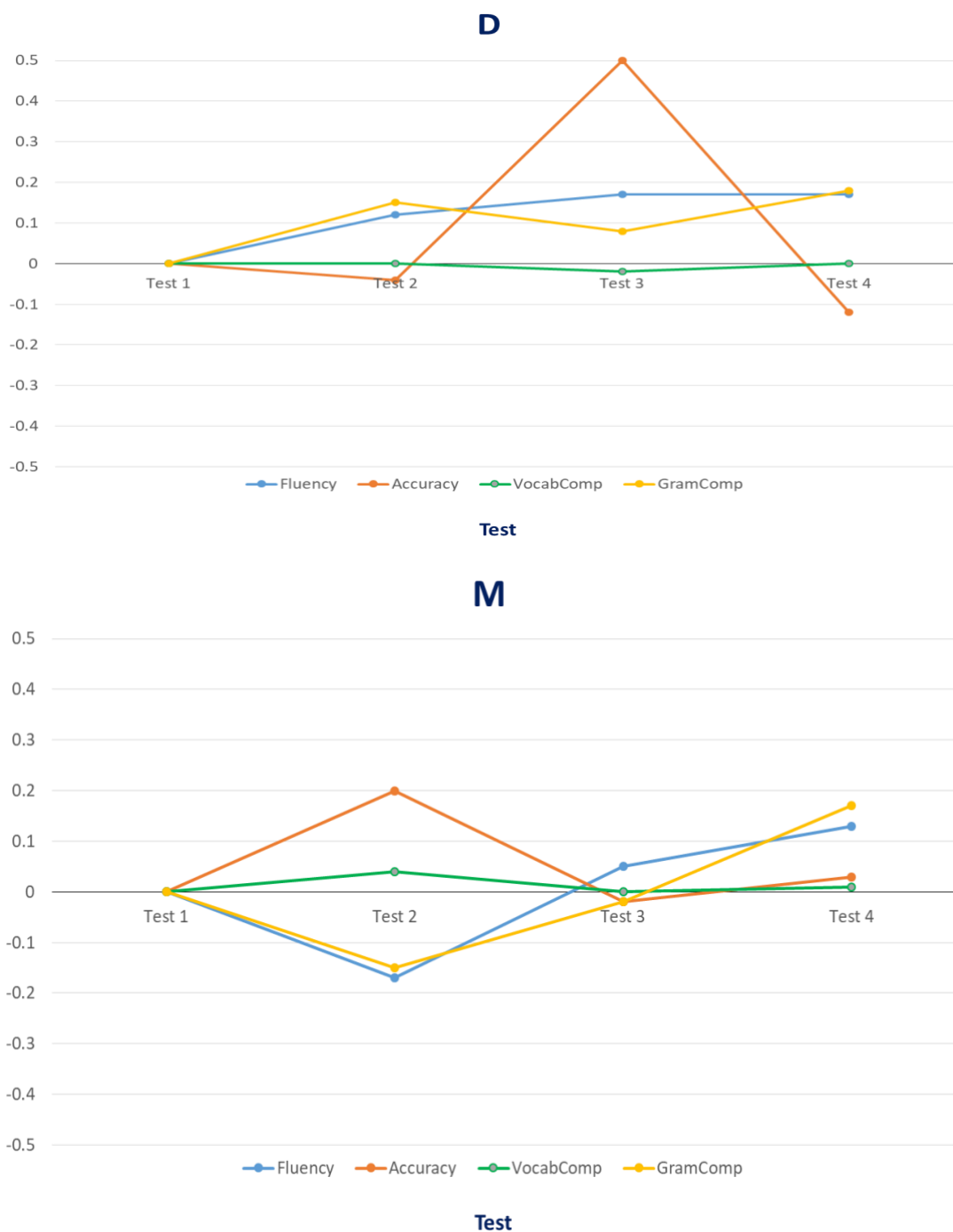
In conclusion, the quantitative analysis shows that the group overall experienced improvements in fluency, accuracy, syntactic complexity, and lexical complexity. However, each participant had a unique developmental trajectory. Furthermore, their progress was marked by fluctuations rather than a steady upward trend, highlighting their language development's chaotic and non-linear nature.

Qualitative analysis

Owing to spatial constraints, in this qualitative analysis, I will selectively present certain data

to highlight specific language performance aspects under the DST view. The chosen data primarily derive from narrative stories provided by participant G, who holds a bachelor's degree in English Language Teaching and has four years of experience as a teacher of English. She works part-time at a language center and also tutors several private classes at home. Table 2 contains seven idea units arranged in a table to facilitate comparison. All of the original features, including grammatical errors, have been preserved.

Table 2.

Participant G's written story data from four tests (seven idea units)

Idea Unit	Test 1	Test 2	Test 3	Test 4
1		As soon as the Tet holiday passed, the Vietnamese government gradually implemented the social distancing policy, fearing it would get out of control due to a lack of medical aid and equipment.	As soon as the Tet holiday passed, the Vietnamese government gradually implemented a social distancing policy throughout the country, fearing that it would become out of control due to a lack of medical aid and equipment.	As soon as the Tet holiday passed over, a social distancing policy was gradually conducted throughout the country by the Vietnamese government in fear of being out of control for lacking medical aid and equipment.
2	It was exactly the day after the Tet holiday that my manager organized an urgent meeting and carried out an online teaching workshop, which enabled teachers to help students avoid being interrupted in their learning due to the pandemic.	Immediately, my center manager organized an urgent meeting to figure out some solutions to help students not be interrupted in their learning process. The meeting ended up choosing the Zoom app as an interactive teaching method over the distance.	Immediately, my center manager organized an urgent meeting to devise some online teaching methods that would help students avoid being interrupted in their learning process.	Immediately, my center manager organized an urgent meeting to devise some online teaching methods that would help students avoid being interrupted in their learning process.
3				Obviously, online teaching was altogether supported to be the best solution to such a challenging situation.

4	At that time, the Zoom app was the best choice for nearly all schools and institutions to inspire students with knowledge at a distance.	*(..., which ended up choosing the Zoom app as an interactive teaching method through a far distance.)*	At that time, Zoom became the best choice for nearly every school and institution, which could enable teachers to interact with their students with some simple tools.	At that time, Zoom became the most appropriate application for nearly every school and institution carrying out online classes, which could enable teachers to interact with their students with some simple tools.
5	I spent a complete day preparing for a detailed lesson plan **on** the first trial day.	My extreme insecurity made me spend the whole day preparing a detailed lesson plan **for** the first trial day.	My extreme insecurity made me spend the whole day preparing a detailed lesson plan **for** the first trial day.	**On** the first trial day, while I was struggling to prepare a detailed lesson plan, my insecurity gradually increased in my mind
6				Sometimes, I felt that I could not control my rapid heartbeat.
7	I was so stressed out that I **went to** the center very early to set up my laptop and microphones.	I was so stressed that I **came to** the center very early to set up my laptop and microphones.	I was so stressed that I **came to** the center very early to set up my laptop and microphones.	In fact, I was so stressed out that I **came to** the center very early to set up my laptop and microphones.

Several notable differences are observed in the narrative. One of the most outstanding features is the emergence of new idea units in later tests that were not present in the initial one. For example, idea unit #1 was absent in the first test, and idea units #3 and #6 only appeared in the fourth test. Another significant difference is the increased complexity in viewpoints seen in the last test (e.g. a detailed description of the government's response to the coronavirus pandemic in idea unit #1) and changes in verb tense compared to earlier versions. This complication in tense is obvious in idea unit #5, where G shifted from using the Simple Past tense in tests 1, 2, and 3, *"I spent a complete day preparing..."* to the Past Continuous in test 4, *"...while I was struggling to prepare...".* The alteration in tense also reflects a change in the narrative focus from describing actions *"preparing for a detailed lesson plan..."* to expressing emotions *"my insecurity gradually increased..."* Given that G is doing a storytelling task with the teacher as a targeted reader, her use of language probably aims to evoke the teacher's empathy by sharing her growing feelings of anxiety.

During the study, the inconsistency in language use, especially the alternation of prepositions, was also observed (e.g., "on" and "for" in idea unit #5). Language instruction might have influenced these shifts in preposition usage by emphasizing distinctions between these prepositions in class. Another common pattern is the ephemeral nature of language performance. This is exemplified in idea unit #7, where the verb "went to" used in test 1 was later replaced by "came to"despite both versions being grammatically correct. Such transient language forms are also recorded in the narrative stories written by Participant D, a high-school teacher (Table 3). That is the verb "tasted" in idea unit #1, initially used incorrectly in the first two tests, was corrected to "taste" in test 3.

Table 3.

Participant D's written story data from four tests (one idea unit)

Idea Unit	Test 1	Test 2	Test 3	Test 4
1	For the rest of our travels, we decided to visit the neighborhood islands to learn more about the residents' lives and **taste** their special cuisines.	For the rest of our traveling, we decided to visit the neighborhood islands to learn more about the local culture and **taste** their special cuisines.	For the rest of our travels, we decided to visit the nearby islands to learn more about the local culture, **taste** their special cuisines, and dive to see colorful reefs and underwater creatures.	We tried out so many new things there, such as surfing and diving to see the colorful coral reefs and beautiful underwater creatures.

Discussion

This study aims to assess the reliability and applicability of Larsen-Freeman's (2006) research findings in the EFL (Vietnam) context to construct a more comprehensive understanding of how DST affects language acquisition. The research results revealed both similarities and differences compared to Larsen-Freeman's. As the data were analysed via both quantitative and qualitative methods, the discussion will be structured in these two types of data.

Quantitative Analysis

At the macro level, the average group performance indicates advancements in four indices: fluency, accuracy, lexical complexity, and syntactic complexity. These findings align with Larsen-Freeman and other researchers like Bygate et al. (2001), who argue that repeated tasks improve accuracy and fluency. At the micro level, an analysis of interindividual progress over the period of three months reveals varying trajectories compared to group averages, which is in accord with Larsen-Freeman's. These divergent developmental patterns demonstrate that language is dynamic and chaotic as a complex system.

The results from intraindividual variability show that the principle features of DST are evidently met, namely nonlinearity in development, complete interconnectedness, interaction with the environment, and individual variation. To be more precise, the four participants displayed different performances, characterized by periods of growth and decay. Even within each learner's development, all dimensions had no uniform developmental pathway. This highlights the necessity to differentiate specific components, as Norris and Ortega (2009) suggested, and to adopt more personalized approaches to language assessment, as stated by Polat and Kim (2013). The finding is in agreement with Larsen-Freeman's research, which observed significant variation in performance among five Chinese learners. Eskildsen (2012), investigating the utilization of adult learners' multi-word expressions, also revealed that his participants' progression unfolded unevenly, affected by contextual factors and prior language exposure. Similarly, Dong (2016) highlighted non-linear patterns in EFL learners' writing development, indicating that improvements in a particular language domain sometimes coincided with other regressions. These studies affirm that nonlinearity is a consistent phenomenon in language learning across both ESL and EFL contexts.

The findings also prove that language acquisition operates as a dynamic system with interconnected elements and involves trade-offs among different dimensions. Obviously, there was a resource competition between accuracy and lexical complexity in the linguistic development of the four learners, though this was less noticeable for Participant T. The increased emphasis on accuracy can be attributed to the participants' roles as teachers of English. In Vietnam, English teachers are required to be absolutely precise about language use since they are expected to be models for learners to follow. Thus, they have to maintain high accuracy levels in their language (Lewis, 2002). This expectation will likely influence these participants' learning experiences as the learner's performance adjusts according to different contexts to establish their own developmental path (Larsen-Freeman, 1997). This explanation can also clarify why T experienced less "intense" competition. Among the four participants, T has the least teaching experience and has only recently taught one or two classes. Thus, she is less influenced by the aforementioned belief. A similar observation regarding the interplay between accuracy and complexity was noted in Larsen-Freeman's study, possibly due to the unique circumstances of the learners involved as well. All of her participants were professionals who needed high accuracy in their careers. However, Polat and Kim (2013) found a stark difference in their results with advanced learners in Turkey, who showed significant improvements in complexity but no corresponding development in accuracy after a year. Again, this disparity can be because of the learners' context; immigrant workers learn English through everyday communication, targeting efficient communication over strict accuracy. These outcomes illustrate that language development is not a linear process but rather adaptive and responsive, shaped by the surrounding environment to create its own developmental dynamics.

When plotting lexical complexity against syntactic complexity, it is intriguing to note that most of my learners, except participant D, placed greater emphasis on vocabulary. This contrasts with Larsen-Freeman's findings, where four out of five participants in her study prioritized grammar. Although replicating Larsen-Freeman's exact language instruction was not feasible, her key foci on grammar were faithfully maintained in this research. Hence, the observed discrepancy in language learning outcomes may stem from differences in learners' priorities.

Among the four participants, G, T, and M were concurrently preparing for an IELTS examination and attending additional preparation courses alongside regular classes, unlike D, who worked full-time as a high school teacher, did not. In Vietnam, the IELTS holds vital implications for the life opportunities of test-takers. Nguyen (2025) also indicates that high-stakes tests like IELTS can exert considerable washback effects on students' learning behavior, potentially influencing their learning outcomes and shaping their focus and strategies. Moreover, these IELTS preparation courses typically emphasize various linguistic components, with vocabulary learning being particularly targeted due to its perceived importance for success (Drummond, 2018). Therefore, learners preparing for the IELTS exam may prioritize vocabulary acquisition more than grammar. Conversely, D, as a high school teacher, may give more priority to grammar due to its central role in high school language instruction in Vietnam (Lewis, 2002). Despite the differences in results compared to the original study, via analyzing the participants' context, this discrepancy further highlights the contextual triggers behind developmental divergence.

Qualitative Analysis

The qualitative findings reinforce the dynamic interaction between learners' environments and their evolving linguistic systems. Take Participant G's writing as an example; her reference to

the Vietnamese government's response to the Coronavirus pandemic in test 2 coincided with Vietnam's second national lockdown, evoking reminiscence of her previous experience during the first lockdown shortly after the Tet holiday. Similarly, in a study carried out with 28 EFL learners, Ngo (2025) indicates that learners' cultural backgrounds can positively influence language development. These studies underscore the role of cultural and social engagement in developmental processes. Furthermore, the appearance of new idea units and self-correction attempts (e.g., D's endeavor to self-correct the verb "tasted" to "taste", G's struggles with the prepositions "on" and "for" or between the verbs "went to" and "came to") emphasizes the emergent nature of linguistic development. These phenomena align with Larsen-Freeman's key DST features, yet this study further contextualizes these changes within a culturally distinct educational context.

The study's findings challenge the assumption of linear developmental patterns, demonstrating that learners' unique socio-academic contexts drive distinct linguistic priorities. This research enriches the DST framework with a more context-sensitive perspective by shedding light on how contextual factors like individuals' social positions and exam pressures interact with internal language systems.

In conclusion, this study corroborates the nonlinearity and context-dependence identified in Larsen-Freeman's study while also demonstrating how particular cultural and educational factors in Vietnam actively shape learners' dynamic trajectories. These insights advocate for more individualised assessment approaches and highlight the necessity of accounting for socio-contextual influences when teaching and assessing learners.

Conclusion

This research aimed to validate Larsen-Freeman's (2006) findings in the EFL context, where learning environments differ significantly from ESL settings. A replication study closely mirroring the original study's methodology, including participant proficiency levels, tasks, instructions, data collection, and analysis, was conducted to attain this goal. Through quantitative and qualitative analyses of narrative stories from four Vietnamese upper-intermediate learners, it can be concluded that Larsen-Freeman's findings are applicable in the EFL context. Most of the Dynamic Systems Theory (DST) characteristics identified in the original study were recorded. Despite some discrepancies, these differences support Larsen-Freeman's assertion that the interaction between learners and their environment shapes language development. It can be concluded that Larsen-Freeman's findings are applicable to the EFL context.

Finally, it is worth noting that the sample size of this research is small - only 4 participants. In longitudinal, DST-based research like mine, the goal is to uncover patterns of individual variability over time rather than broad generalizations. This sample size allows for in-depth insights into how each learner's trajectory unfolds in response to internal and external factors, capturing language development's dynamic and context-sensitive nature. However, the targeted participants proficiency in this study are upper-intermediate learners who demonstrated a strong motivation for learning English. Since learners at varying proficiency levels may exhibit different developmental patterns (Larsen-Freeman, 2009), these findings should not be generalized to lower-proficiency learners. Therefore, future research could expand the participant pool across proficiency levels — from beginner to advanced — to provide broader

populations and more comprehensive analysis.

Implications

Regarding pedagogical implications, the study's findings underscore the importance of task repetition for language enhancement. Therefore, language teachers should ensure learners have ample opportunities to repeatedly revisit the same or similar content. For instance, learners could read a passage accompanied by listening or viewing materials on the same topic. Moreover, by having students engage in repetitive tasks over time, teachers can observe and identify changes in learners' language skills, including subtle nuances. This enables teachers to determine when and what type of scaffolding is necessary to support learners effectively.

Moreover, as language constitutes a complex interconnected structure encompassing multiple dimensions, educators should refrain from isolating specific elements when assessing a learner's progress. Rather, they should consider other factors such as the interactions among these competencies and, most crucially, the learner's current circumstances.

Ultimately, the diverse developmental paths of each learner highlight the significance of individual differences in the learning process. Therefore, instead of enforcing rigid, standardized, one-size-fits-all materials and pedagogy, educators and curriculum designers should cultivate an input-rich learning environment that integrates various engaging activities to foster individualized learning experiences. Utilizing online resources can assist teachers in sourcing materials tailored to students' needs and interests. Moreover, recognizing that each learner may possess unique achievement orientations, language courses should prioritize independent learning in conjunction with stated learning objectives for each lesson.

Apart from the educational implications discussed earlier, there are some methodological implications. Since DST inherently focuses on changes over time, time itself is a crucial element in DST-based studies. Therefore, conducting a longitudinal study becomes essential to capture meaningful time-series data. However, adjustments in the frequency and intensity of observations may be necessary to align with the desired timeframe.

Another important implication of the research is the use of VocabProfile to gauge lexical complexity. Given its efficiency and ease in identifying types and tokens, future researchers should consider integrating this tool into their analyses.

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Biodata

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