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Article

The Development of Complexity, Accuracy and Fluency in L2 Written Production through Informal Participation in Online Activities

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Abstract

Research into the online informal learning of English (OILE) examines how non-native speakers of English may develop L2 skills through participation in leisure activities on the Internet in the target language. Such activities include, e.g., watching television series, films, or videos, interacting on Facebook, reading articles, or listening to music. Recent OILE studies have focused on students at French universities and have sought to both inventory language users' online participation habits and track their L2 development (Kusyk & Sockett, 2012; Sockett, 2011, 2014; Sockett & Kusyk, 2015; Toffoli & Sockett, 2015). This article provides updated OILE participation data on French students and, for the first time, German university students. In order to increase awareness about current OILE practices, results of a questionnaire (N = 953) of OILE habits are presented. In addition, development in complexity, accuracy, and fluency of three individual study participants was tracked over a period of five months. Results show a great deal of inter- and intraindividual variation, highlighting the need to consider L2 development as a complex and nonlinear process, especially when analyzed within an online, informal context.

KEYWORDS: ONLINE INFORMAL LEARNING OF ENGLISH (OILE); SECOND LANGUAGE DEVELOPMENT; L2 WRITTEN PRODUCTION; CASE STUDIES; DYNAMIC SYSTEMS THEORY; USAGE-BASED LANGUAGE LEARNING; CAF

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Introduction

The Online Informal Learning of English

The online informal learning of English (OILE) is a field of research that seeks to investigate the ways in which nonnative speakers (NNSs) of English interact in and with English in an informal, online context, as well as the impact that these interactions may have on NNSs' second language (L2) development. Toffoli and Sockett (2010) coined the term OILE and have carried out initial research primarily within a French context, with university students as the main population examined. They define OILE as the participation by NNSs in a wide variety of leisure activities that involve the exposure to and/or use of English, in the absence of any externally imposed structure or timetable (Toffoli & Sockett, 2010). Such activities include, for instance, watching television series, movies, and videos, reading articles and forums, listening to music, or interacting on Facebook. Toffoli and Sockett consider that these activities may have an impact on NNSs' knowledge and use of English, but that they may have no awareness of this impact.

To date, OILE studies have primarily addressed two research questions:

1. What are the nature and frequency of OILE interactions?
2. How does participation in OILE impact participants' L2 development?

Toffoli and Sockett (2010) address the first research question in an article reporting on a survey of more than 200 students at the University of Strasbourg. Initially unsure of both the scope of OILE as well as the specific activities engaged in, the researchers discovered that more than 54% of students surveyed listened to English (through series, films, or music) more than once per week, while 18% read in English more than once per week (primarily content on Facebook).

Kusyk and Sockett (2012) attend to the second research question in a study on vocabulary knowledge in which they compared frequent (one hour per week or more) and nonfrequent viewers of online television series. In two different groups tested (either heterogeneous or homogeneous with regard to proficiency levels), a statistically significant difference in vocabulary knowledge test scores was observed; that is, frequent series viewers obtained better scores than nonfrequent viewers. "Frequent" is, to be sure, a subjective term defined by the researcher, and it may be argued in the case of Kusyk and Sockett (2012) that a minimum rate of one hour per week is actually not a frequent occurrence. Subsequent OILE studies such as those discussed by Sockett (2014) as well as the present article have, therefore, refined definitions of "frequent" in an effort to deliver a clearer, more precise picture of activity participation rates.

Preliminary studies have given L2 researchers reason to believe that OILE is a phenomenon that does not just fall within the purview of several ardent

Facebook users or film fanatics, but rather does exist on a larger scale and merits closer inspection. It is with this in mind that the author decided to research OILE for her dissertation, certain results of which are discussed in this article. (For further reading on OILE, Sockett, 2014 provides a comprehensive state-of-the-art of the field, including an overview of all studies conducted between 2009 and 2013.)

Theoretical Framework

The present article examines OILE within the constructionist framework of usage-based language learning and dynamic systems theory, which emphasize both the cognitive and environmental factors that come into play during the learning process, the nonlinear trajectories (progression and attrition) of individual learners, and language as a social tool that is embedded with authentic meaning and used as a means to a communicative end. Both approaches are briefly explained below.

Usage-based Language Learning

The term *usage-based* (UB) was coined by Langacker (1987), who considers the linguistic systems of individuals as life-long inventories of concrete usage events. Tomasello (2009) summarizes the UB approach to linguistic communication in two key descriptions: "meaning is use" and "structure emerges from use" (p. 69). The former refers to the notion that language is learned through meaningful experience, that it is situated in a social context, and that language is a tool, used as a means to an end. A UB perspective maintains that "all things flow from the actual usage events in which people communicate linguistically with one another [and that the] linguistic skills that a person possesses at any given moment in time … result from her accumulated experience with language across the totality of usage events in her life" (Tomasello, 2000, pp. 61–62).

One goal of UB approaches to language learning is to provide an alternative account to the generativist approach of the acquisition of language. The latter aphorism, "structure emerges from use," represents a nongenerativist conception of grammar in which language structure emerges from repeated use as well as from powerful domain-general cognitive mechanisms such as categorization, entrenchment, statistical learning, pattern-finding, and chunking (Behrens, 2009; Bybee & Beckner, 2009; Tomasello, 2009). This viewpoint stands in opposition to the nativist/generativist perspective that each of us is equipped with an innate language faculty which, governed by the rules of universal grammar, allows children to develop creative and complex linguistic systems despite insufficient input.

Though much of the UB literature has focused on L1 acquisition, UB theorists contend that the general cognitive mechanisms mentioned above can also

account for L2 learning processes. For example, *entrenchment*, the strengthening of memory traces as a result of frequent occurrence with a particular linguistic unit, is involved in the automatization of access to information. *Categorization* allows speakers/learners to filter similarities and dissimilarities amongst the input, and, on the basis of shared properties, classify different "members" into representational groups. Through this process, generalization and schema-formation may occur, which may ultimately "account for the extraction of very rule-like phenomena" (Behrens, 2009, p. 386). From the UB perspective, frequency also plays an important role in L2 learning, with token (number of total item occurrences) and type (number of unique item occurrences) frequency influencing in particular entrenchment and generalization/abstraction, respectively (Verspoor & Behrens, 2011; Bybee, 2008).

Dynamic Systems Theory

The origins of Dynamic Systems Theory[1] (DST) can be traced back to the 19th century and French mathematician Henri Poincaré who, in combining mathematical and physics principles, laid the foundations of our modern-day conception of the theory (Aubin & Dahan Dalmedico, 2002). In roughly the last 30 years DST has expanded its influence outside of the hard sciences to the social sciences, for example in psychology and applied linguistics (de Bot, Lowie, & Verspoor, 2007; Larsen-Freeman, 1997; Nowak, Vallacher, & Zochowski, 2005; van Geert & Steenbeek, 2005). At its core, DST is a framework that allows for studying change in systems over time. In many cases, the systems in question are usually considered to be complex, that is, they are composed of two or more variables that are interconnected. For applied linguistics, and the field of second language development[2] (SLD) in particular, a complex system could refer to a language-learning community, a language or the L2 development of an individual learner. The DST approach takes into account many different aspects of the L2 learning process and has even been put forth as a comprehensive theory of SLD (de Bot, Lowie, Thorne, & Verspoor, 2013). The following is a brief overview of some of the main characteristics of DST and their application to SLD.

A dynamic and complex system's trajectory is at any given moment dependent upon the *initial conditions* of that system. That is, minimal changes at an earlier stage within a system may lead to massively different outcomes at a later stage (de Bot & Larsen-Freeman, 2011; de Bot et al., 2007). In an SLD context this means that initial differences between language users (e.g., habits and activities in the L2, motivation, aptitude, and working memory capacity) may lead to very different system behavior later on.

The elements (parts, subsystems) within a complex and dynamic system are believed to be *completely interconnected*, though the strength of connections

between variables varies. For L2 learners this means that any given change in one variable will have an effect on all other variables, though the power of this effect can range from weak to strong depending on a host of factors (e.g., time A versus time B, motivation, affect, exposure to the language, attention paid to a certain aspect). Consequently, system change (development) is said to be *nonlinear*, that is, the effect of a certain action is not proportionate to its cause. De Bot and Larsen-Freeman (2011) sum up the similarity between nonlinear development and the interconnectedness of variables:

> [I]n addition to the direct effect of variables, there is the interaction between the variables, and this interaction is dynamic in the sense that it changes due to the impact the factors have on each other. So the motivation to learn [Mandarin] tones may change due to success in learning, which may then affect the amount of time invested. (p. 13)

They add that certain variables may be more stable (e.g., working memory capacity, previous experience with the L2) while others are more dynamic (e.g., time available to devote to L2 learning, motivation levels), which also contributes to the unlikelihood of linear relationships between variables and outcomes.

In both DST and UB language learning, the *context* in which the system is situated cannot be ignored and is not seen as a simple "background to the main development drama" (Larsen-Freeman, 2015, p. 16). The environment supplies relevant *external resources*, such as "spatial environments to explore, time invested by the environment to support learning … the language used by the environment, motivational resources … and material resources such as books and TV's" (de Bot et al., 2007, p. 11). *Internal resources* are also necessary for system growth (van Geert, 1991) and may include intrinsic motivation, memory capacity, or amount of time available for learning (de Bot et al., 2007). Both types of resources are limited but are also linked and may compensate for one another.

This brief account of DST serves to highlight some of its main features, namely that it is a framework with which researchers can consider multiple, interacting influences within a system (or systems), the nonlinear relationships between these variables and overall system behavior, the personalized history and context with which each system is equipped, and the assumption that system development is dynamic and changing. L2 learning, therefore, is seen as an evolving process that includes both stable and less stable phases rather than the acquisition of a "thing" or "product" with a clear and final end-state.

Research Questions

As mentioned, OILE studies focus on how NNSs interact with and in English in an informal context online, as well as the L2 development that may take place as a result of these interactions. The research questions of this study are:

RQ1 How do language users participate in OILE? (What activities and how often?)
RQ2 How do language users' L2 systems develop through participation in OILE activities?

Methods

A large-scale questionnaire (N = 953)[3] was distributed to both French (N = 538) and German (N = 415) university students as a means of investigating their OILE habits (RQ1). While previous OILE questionnaire data have only been collected at French universities (Kusyk & Sockett, 2012; Sockett, 2014; Toffoli & Sockett, 2010, 2015), the present study includes for the first time questionnaire data collected from German university students. Following the questionnaire, case studies (N = 3) were carried out in order to track L2 development (RQ2).

Questionnaire

Questionnaire data were collected in 2014 at several French and German universities, and participants were an amalgam of degree major and age. As outlined above, the goal of the questionnaire was to examine the nature of the students' online leisure habits in English. The author chose to survey a sample representative of the general university student population, that is, students who specialize in disciplines *other than* English. This was done in an effort to gather data that would reflect how a general (majority) student population participates in OILE activities. Thus, English language and literature majors, who customarily have the ambition to become English teachers and for that reason are further motivated to learn the language, were excluded from the survey.

Case Studies

When studying linguistic development within a DST framework, it is recommended to conduct longitudinal studies which highlight individual trajectories and allow for the examination of phase changes within systems (Cameron & Larsen-Freeman, 2007; de Bot et al., 2013; Larsen-Freeman & Cameron, 2008; van Geert & Steenbeek, 2005). Rather than focusing on isolating variables, it is important to observe how system behavior changes to provide a rich description of the system, of its parts, and of the relationships and interactions between parts. The case study method, with its focus on longitudinal observation and in-depth study of a given phenomenon, was therefore selected as an appropriate method for our study and functioned as a complement to the initial large-scale questionnaire. In addition, it is important to point out that the present case studies are the first of their kind within the specific field of research of OILE. They

are therefore exploratory in nature, and the parameters chosen are by no means the "best" or "only" way to go about studying OILE. They are simply appropriate for a first venture into researching long-term L2 OILE development.

The data reported on in this article are drawn from case studies that took place over a period of five months (May–October 2015). Data were collected from both French and German students; however, due to space restrictions only the French cases are presented here. From a DST perspective, however, in which the focus is on *intraindividual* system (L2) development, the L1 of the individual cases does not play a central role; what matters most is teasing out relationships between interacting variables and observing subsystem behavior. Unlike quasi-experimental studies, there is no intention here to compare L2 development across groups, and a direct comparison within cohorts also does not fall under the research aims of the present study, as each case has his/her own idiosyncratic OILE habits and different initial conditions (L2 starting points).

As to the specific proceedings of the case studies, semi-structured interviews were held every six weeks during which the participants responded to questions about their OILE activities, followed by a written activity. The activity (the results of which are reported on in this article) consisted of writing about a familiar topic: students chose between either recreating several scenes of a favorite television series or writing a fan fiction scenario of a favorite television series. The time limit was 15 minutes.

Participants had self-evaluated themselves at between a B1 and B2 proficiency level for a majority of language skills according to the *Common European Framework of Reference for Languages* (Council of Europe, 2011) descriptions. Furthermore, they were not English specialists nor currently enrolled in an English class and had all recorded frequent usage of a multitude of OILE activities (especially series viewing, hence the subject of the written activity).

These choices notwithstanding, interesting and relevant learning processes could certainly be examined by studying different populations, such as more beginner or more advanced learners, or those with a more intense relationship with the L2 (such as English majors). As with any case study conducted in the informal sphere, the phenomenon being observed here takes place "in the wild" (Wagner, 2015) and as such there is an inherent risk that the profiles and participation rates recorded at the beginning of the study could fluctuate throughout its duration.

Complexity, Accuracy, and Fluency Measures

Complexity, accuracy, and fluency (CAF) measures refer to performance indicators that are applied to L2 oral and written production. In the present study they were used to analyze L2 written productions carried out within the case studies. CAF measures take into account different elements of L2 development, as it

has been proposed that L2 users may choose (consciously or not) to prioritize one aspect of L2 performance over another due to limited processing capacities (Ellis & Barkhuizen, 2005; Skehan, 1998; VanPatten, 1990). Complexity refers to the extent to which language users produce sophisticated or elaborated language, and represents the upper limits of the L2 system (Ellis & Barkhuizen, 2005). Accuracy describes how well the target language is produced according to its rule system (grammar) (Skehan, 1996). Fluency refers to the production of language without undue pausing or hesitation (Ellis & Barkuizen, 2005) or to the ability to access language knowledge, with control over access improving as the process becomes automatized (Wolfe-Quintero, Inagaki, & Kim, 1998).

The specific measures used to analyze the present L2 written data are:

- Grammatical complexity: Clauses per T-unit
- Lexical complexity: Lexical diversity "D"
- Accuracy: Errors per T-unit
- Fluency: Words per text

A T-unit (minimal terminable unit) consists of an independent clause as well as any attached subordinate clauses (Hunt, 1965) and is an oft-used unit of measure within the L2 development literature (Ishikawa, 2007; Kawauchi, 2005; Larsen-Freeman, 2006; Norris & Ortega, 2009; Storch & Wigglesworth, 2007; Wolfe-Quintero et al., 1998). The researching and testing of L2 development measures is a field of inquiry in its own right, and there is currently no clear prescribed set of measures that is applied consistently throughout L2 studies. It is common to select specific measures that are best suited to the goals and parameters of a given study, which is the approach adopted here. This article provides an overview of participants' L2 development trajectories, hence only one measure per CAF category. Clauses per T-unit, lexical diversity "D", errors per T-unit, and words per text are all CAF measures that have been applied in previous studies (Baba & Nitta, 2014; Larsen-Freeman, 2006; Norris & Ortega, 2009; Skehan, 2009; Vercellotti, 2015; see overview in Wolfe-Quintero et al., 1998), with clauses per T-unit (grammatical complexity) and errors per T-unit (accuracy) considered by Wolfe-Quintero et al. (1998) to be among the best measures of L2 development so far.

Results and Discussion

Questionnaire

The frequency rates of French and German students' participation in OILE activities are exhibited in Figures 1 and 2, respectively. Due to the large number of activities targeted in the questionnaire only the most common activities are featured here. The data are divided into "reception" and "production" categories in order to facilitate viewing.

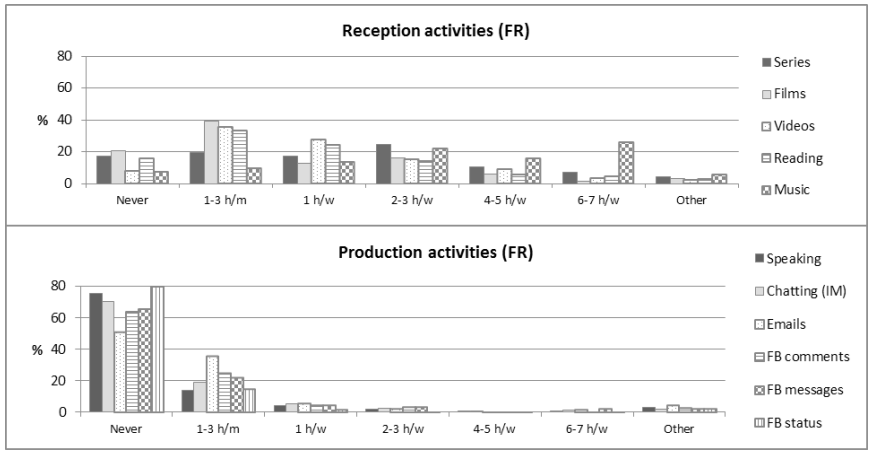


Figure 1. French students' OILE activity participation frequencies; h/m = hours per month, h/w = hours per week. For emails and all Facebook activities the rate is "times per month/week," not "hours per month/week." IM = instant messaging. Series refer specifically to television series, while Videos refer to YouTube or "non-series" videos.

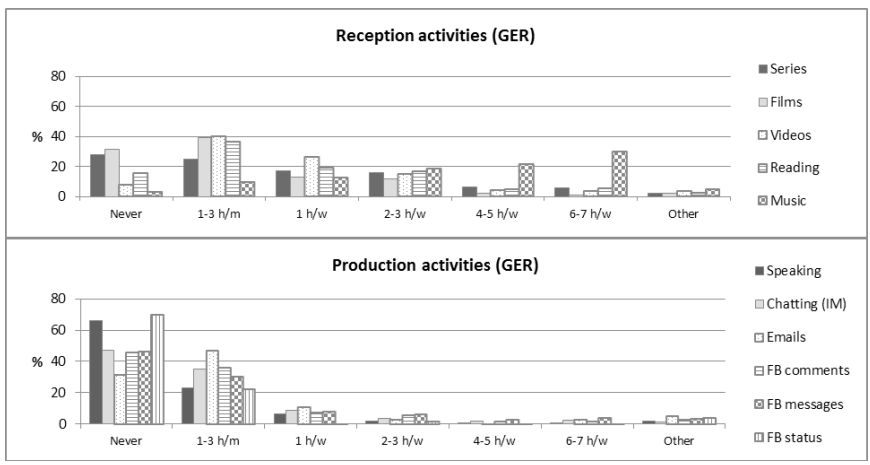


Figure 2. German students' OILE activity participation frequencies; h/m = hours per month, h/w = hours per week. For emails and all Facebook activities the rate is "times per month/week," not "hours per month/week." IM = instant messaging. Series refer specifically to television series, while Videos refer to YouTube or "non-series" videos.

Taking into account the influential role that frequency effects play in a dynamic systems and UB language learning theoretical framework, it is useful to consider the rates with which students participate in terms of high and

low frequencies. Indeed, higher frequency levels for both groups are shown for reception rather than for production activities. Table 1 provides an overview of the frequency results grouped into two categories: "rarely" (*never* and *1 to 3 hours per month*) and "regularly" (from *1 hour per week* to *6–7 hours per week*).[4]

Table 1
Aggregated OILE frequency percentages

OILE habit	French		German	
	Rarely	Regularly	Rarely	Regularly
Series	36.8	59.1	52.5	45.5
Films	60.2	36.6	70.6	27.2
Videos	43.5	54.6	47.7	48.9
Reading	49.1	48.5	51.6	45.8
Music	17.1	77.1	12.3	82.9
Speaking	89.4	7.4	89.2	9.2
Chatting (IM)	88.8	9.3	82.4	16.1
Emails	86.6	9.3	77.8	17.1
FB comments	88.7	8.7	81.4	15.9
FB messages	88.1	9.9	76.1	20.5
FB status	94.1	4.1	91.8	4.1

This depiction of the results shows that listening to music in English is the most popular OILE activity for both French and German students ("regular" for approximately 80% of both groups). Watching series, videos, and reading also appear to be quite popular, with either nearly or more than half of both groups participating regularly in these activities.

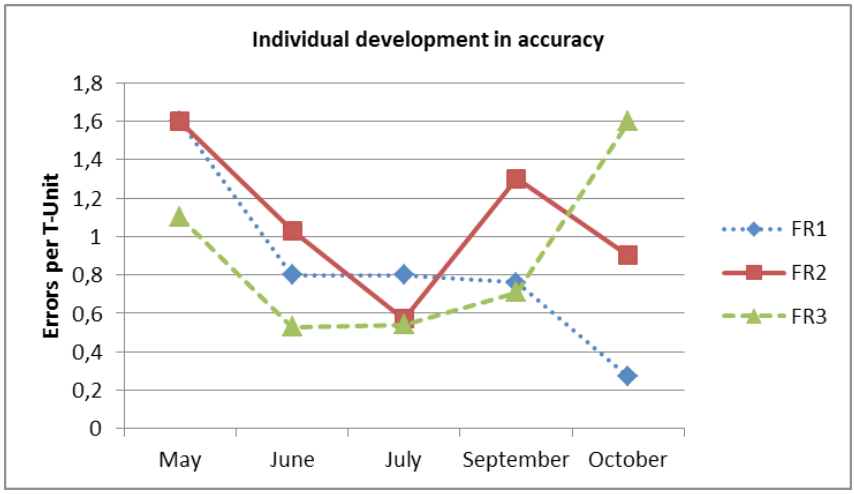
OILE participation between the two groups appears to be somewhat similar. French students participate more regularly in series, films, videos, and reading, while German students participate more regularly in music, speaking, chatting (IM), emails, Facebook comments, and Facebook messages. In both cases, reception activities are more frequent than production activities and it appears that the majority of students partake in some kind of

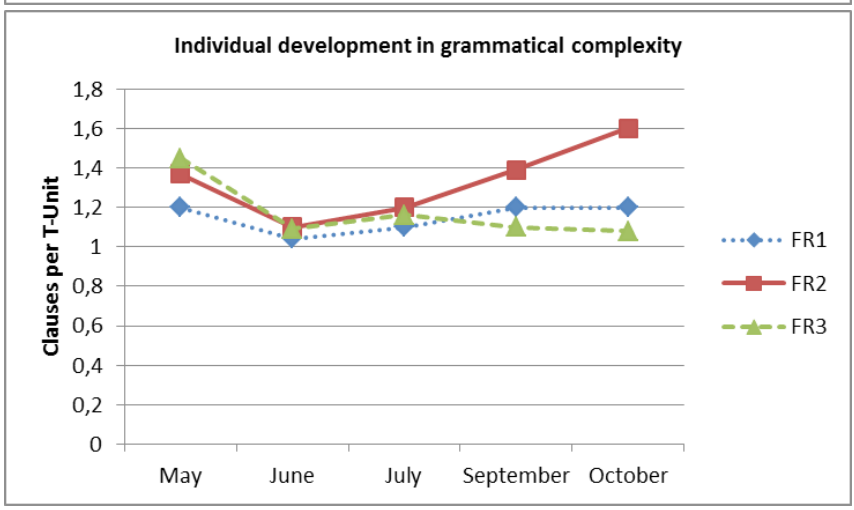
reception activity, even if for some this participation is not frequent (one to three hours per month).

Although the questionnaire data only provide a cross-sectional look at OILE participation habits and do not actually tell us anything about potential L2 development, they nonetheless provide important information about OILE as a phenomenon: they confirm findings of earlier surveys conducted at French universities which suggest that OILE is relevant for large percentages of the general student population (Sockett, 2014), and they indicate that OILE is practiced not only at French universities, but at German ones as well. The questionnaire results give us reason, therefore, to explore OILE participation further, on a more individualized and detailed level.

Case Studies

As is standard within the DST L2 development literature, the analysis of the case studies focuses on individual trajectories and variation (for an overview of L2 development analysis within the DST framework, see Verspoor, de Bot, & Lowie, 2011). The first set of results (Figure 3) shows each individual trajectory for each CAF development measure. It is clear from each graph that each L2 user is on his/her own unique development path, despite similar profiles having been selected for the study. The importance of reporting *individual* L2 variation is also apparent when considering that simply calculating group averages masks relevant information on L2 growth and decline. For example, taking a group average for accuracy would conceal the stark difference between FR1's and FR3's performance data for the month of October. All three students appear to experience variation in their L2 development; that is, no one's L2 trajectory follows a linear, steadily increasing path, though certain patterns do seem to appear: lexical diversity appears to follow a similar, gradual rise and subsequent decline for all three cases; grammatical complexity begins with a small decline followed by a gradual increase or plateau; accuracy begins with a three-month improvement and/or plateau (a descending trajectory on the graph signifies *better* accuracy, as this measure represents number of errors), though after July, FR3's trajectory differs more substantially; for fluency, FR1 and FR2 appear to have similar trajectories from June onward.


Individual development in accuracy
Errors per T-Unit
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
May
June
July
September
October
FR1
FR2
FR3


Individual development in grammatical complexity
Clauses per T-Unit
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
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September
October
FR1
FR2
FR3

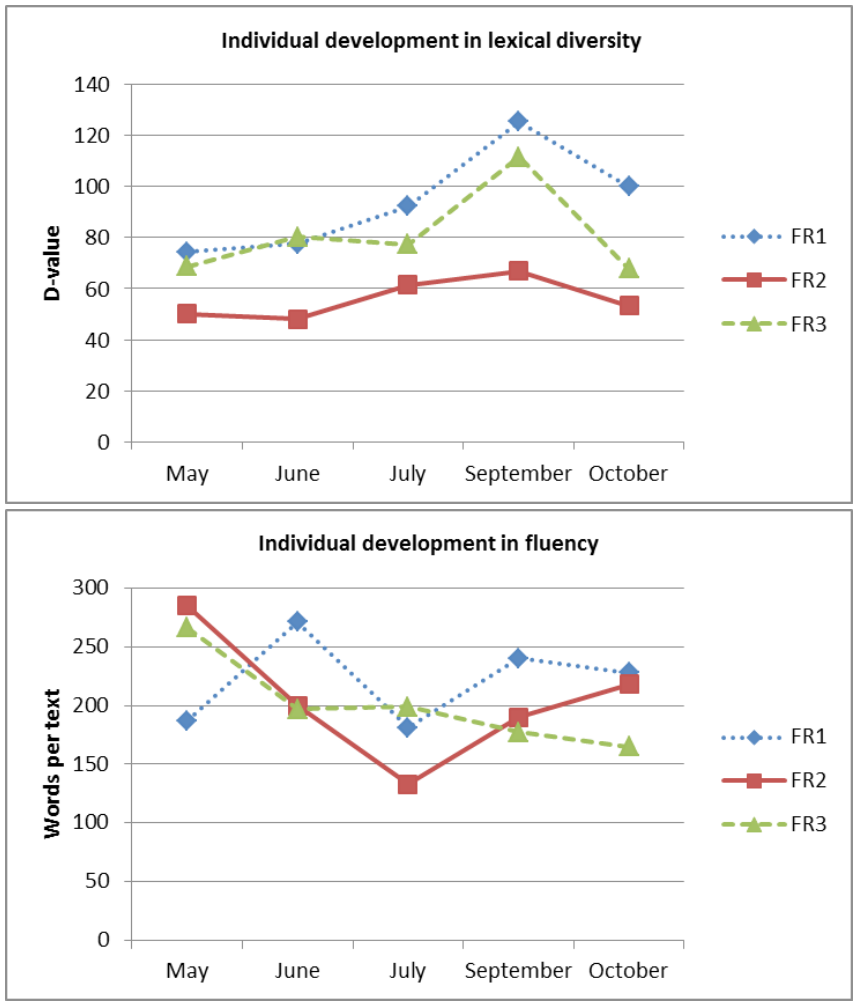

Figure 3. Interindividual development on four written performance CAF measures.

While Figure 3 displays individual data per CAF measure, a more detailed understanding of L2 system development comes from observing *intraindividual* trajectories. Figure 4 shows each case as its own unit, with CAF measures plotted against one another. The measures were converted into z-scores in order to allow for comparability across indices. Once again there are intersecting, nonlinear developmental paths, with some performance measures rising or declining in concert, and others exhibiting more disparate trajectories.

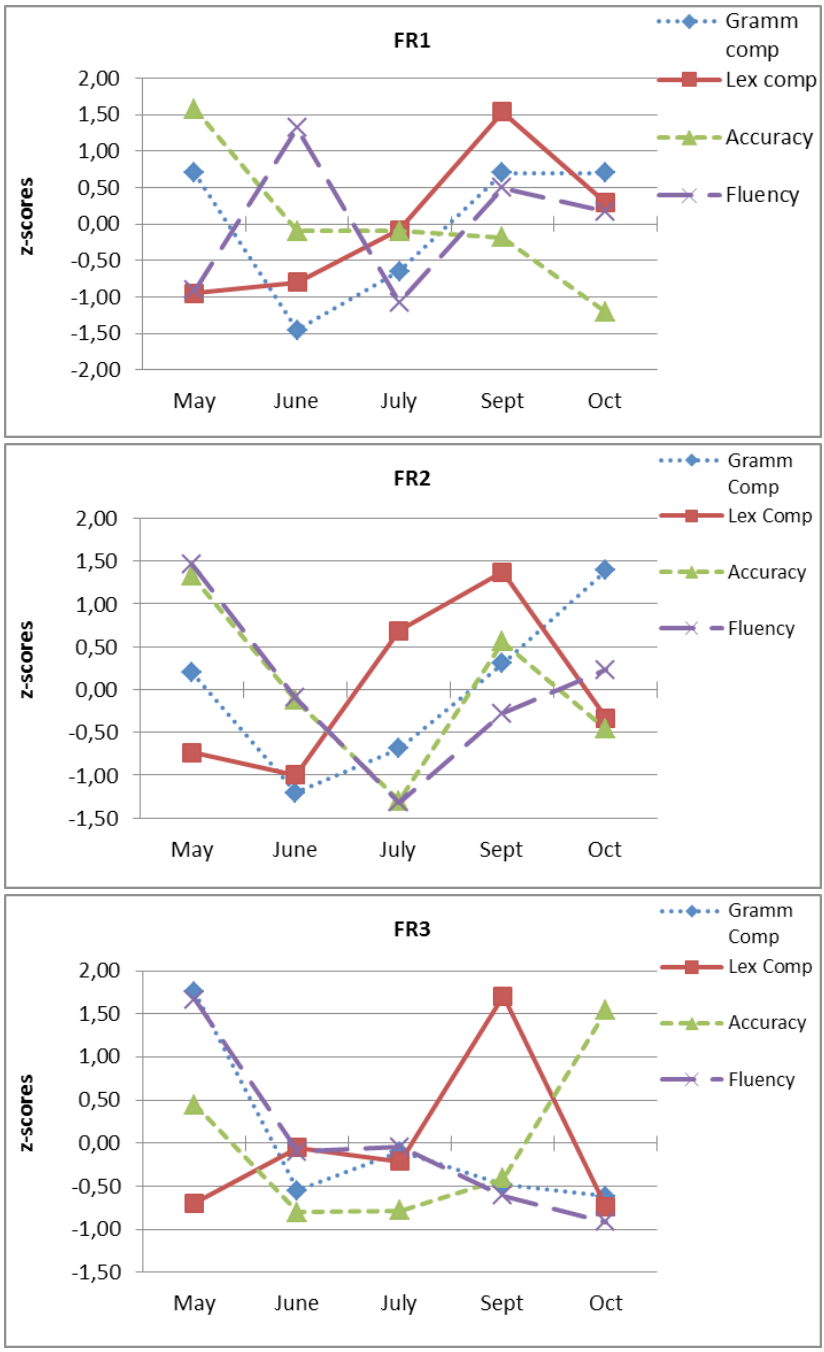

Figure 4. Intraindividual development of three case study participants on four written performance measures. Accuracy is measured by number of errors per T-unit; a dip indicates therefore better accuracy (fewer errors) and a rise indicates poorer accuracy (more errors).

Aside from contrasting values in May, FR1's grammatical and lexical complexity appear to rise together, ending at similar values in October. This suggests a possible "connected–grower" relationship (a DST notion, indicating variables that grow together). Grammatical complexity decreases as accuracy increases (fewer errors) and then plateaus, after which both grammatical complexity and accuracy slightly increase. Fluency appears to go through a series of considerable changes at most data collection points.

FR2's development reveals two different and potentially competitive relationships between measures. First, fluency and accuracy appear to advance at odds with each other: when values are high for fluency, the number of errors per T-unit is also elevated; similarly, when the number of errors drops (increased accuracy), the level of fluency also declines. Secondly, fluency and lexical complexity appear to compete with each other insofar as high fluency values occur alongside low lexical complexity values, and vice versa, suggesting that FR2 chooses (consciously or not) to prioritize either more fluent and less lexically complex written productions (e.g., in May), or more lexically complex and less fluent productions (e.g., July–September).

A mirrored relationship appears with regard to FR3's grammatical complexity and fluency for the entire five months, with the two measures rising and declining together. Lexical complexity and accuracy also appear to be linked to some degree, with initial low accuracy and low complexity slowly increasing and plateauing together, until September, when lexical complexity suddenly increases without much change in accuracy, and in October both measures drop considerably (increased errors and decreased complexity values).

Given the very similar trajectories of FR3's grammatical complexity and fluency, a correlation was run to assess their relationship, and a positive correlation with a large effect size was found: $r = .960$, $p < .01$, $R^2 = .92$. (As this study reports on only five data collection periods, testing for this correlation was purely explorative.) This result can be considered within the vast research literature on CAF, which studies the different combinations of trade-offs between measures. Skehan (1998) suggests that NNSs have to choose first (consciously or not) between form (accuracy and complexity) and meaning (fluency) and then again between accuracy and complexity. Wendel (1997) proposes that language users have to choose between fluency and form, and that the aspect of form that is sacrificed if fluency is chosen is always accuracy. In other words, fluency and complexity may occur together (the case of FR3) but not fluency and accuracy; however, FR3's October data show both low accuracy (high error count) and relatively low complexity and fluency. Despite the different trade-off hypotheses in the literature, Ellis and Barkhuizen (2005) admit that there is no clear picture as to what is consistently

traded-off and under what circumstances. In order to better contribute to the ongoing research in this domain, it would be necessary to test multiple sub-measures (e.g., multiple complexity measures, multiple accuracy measures, etc.) against each other, rather than just one measure per CAF category as was the case here. Testing multiple CAF measures against each other would also provide a more detailed look into the development processes going on between systems and subsystems, which is an important analytical approach from a dynamic usage-based perspective (Verspoor et al., 2011).

Finally, Figure 5 shows the extent to which case study participants' OILE participation habits change over time. Their top six most frequent activities are displayed. It is clear that their leisure habits fluctuate a great deal (e.g. FR1's music participation in May rose at one point to 31.5 hours per week), which can be attributed to a multitude of reasons: exam period, on vacation, sick in bed, outside enjoying nice weather, etc. These fluctuations remind researchers of the changing and unpredictable nature of the external and internal resources of L2 learners, and the ways in which resource usage and availability play out in the informal sphere: motivation waxes and wanes, activity cycles begin and end (e.g., the release dates and duration of a particular television series, achieving different levels in a video game), schedules (and levels of stress) evolve throughout semester, exam, and vacation periods. These are all elements of the authentic OILE context and L2 usage as it takes place "in the wild."

The analyses conducted here give a general overview of development trajectories rather than examine the specific transitions between development phases. In future analyses it is therefore necessary to dig deeper into L2 subsystems (e.g., multiple measures of grammatical complexity rather than just one each for complexity, accuracy, and fluency). This will allow a more detailed view of the variables that grow together or compete against one another, thereby enabling a clearer understanding of how L2 systems may change. The dynamic, usage-based view of L2 development as applied to OILE users provides an adapted, appropriate framework for examining this system change, which is essential given the changing levels of motivation and participation (frequency) among university students. The methods used in this study may not be as "clean" or linear as more traditional, reductionist methods, but they allow for a realistic understanding of how L2 systems change through authentic, self-motivated participation in online, informal activities.

The implications of this research also extend into formal English learning: the questionnaire results presented here suggest that significant amounts of university students who specialize in subjects *other than* English nevertheless interact with the language between one and seven hours per week in an informal manner. (Those who participate in multiple activities may very well far

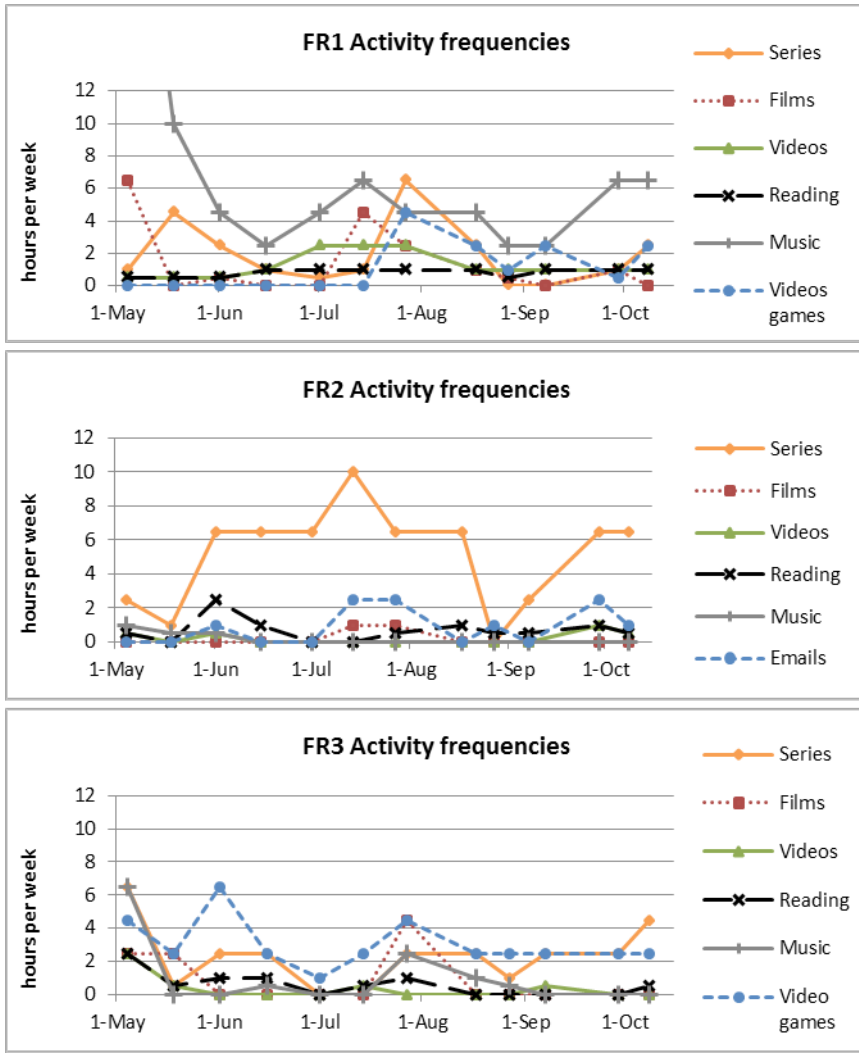

Figure 5. Case study participation levels in different OILE activities. Video game participation, while not included in Table 1 due to low overall participation rates, is included here as it is a favorite activity of FR1 and FR3.

exceed seven hours per week.) For teachers of students taking a non-specialist English course at university (e.g., as an elective or fulfilling a language requirement for a degree program), it is therefore useful to be aware of such participation as well as its self-motivated nature. It takes place in a leisure context in which focus is on meaning and communication, and not on language form and obtaining good grades. The distinction between the terms L2 learner and

L2 user (Cook, 2002) is relevant here in that they denote the different goals and uses associated with interactions in English. The role of the teacher is also called into question as he/she is no longer the sole possessor of knowledge of the target material, though their sociolinguistic expertise could prove especially useful in mediating OILE users' appropriate vocabulary and register usage.

Finally, it should be emphasized once more that this study was exploratory and that future studies could include several modifications that would allow OILE research to be more informative, such as data collection over a longer period of time or more dense data collection. The risk taken here in studying a phenomenon "in the wild" meant that no specific activity participation rates were imposed on the participants, making it difficult to control for variables. In addition, although this study focused on L2 written production, future studies could also study the development of reception skills, especially as the questionnaire results indicate that the highest frequency activities are reception activities. Additional studies could also continue to measure production development, but seek to include participants who regularly participate in production activities; the cases featured in this study—as the majority of questionnaire respondents—spoke or wrote in English much less often than they listened to or read in English.

Conclusion

The findings presented here shed light on how university students interact in and with English in an online informal environment. Such participation occurs "in the wild," with no institutionally imposed curriculum or timetable and arises from intrinsic motivation, such as a wish to be entertained, to be able to communicate with acquaintances, or to find relevant information for personal or school purposes. The wish to better one's English skills is generally not students' primary reason for participating in OILE.

The questionnaire data confirm that participation in informal activities online is not just the pastime of a select few, but rather something in which significant percentages of our sample take part. The French and German university students surveyed reported similar frequency rates for reception activities, though differed somewhat in production rates. Their wide-scale participation validates the need for further OILE research, in order to study its potential impact on L2 development.

By carrying out case studies this article contributes to the expansion of the methodological scope of the OILE field of research. As viewed within the DST approach, the three participants showed great inter- and intraindividual variation, and the importance of displaying individual trajectories was made clear. Future research could examine more CAF measures per category (e.g., several

accuracy measures, or several grammatical complexity measures) in order to better tease out relationships between variables.

Notes

1. Following de Bot et al. (2013) and Dörnyei (2009) the term Dynamic Systems Theory is meant here to refer to a group of theories, including Complexity Theory and Chaos Theory, which focus on the development of complex systems over time.
2. The term second language *development*, as opposed to second language acquisition, is preferred here as an effort to emphasize the L2 learning as a process that includes both growth and decline, rather than a product to be acquired.
3. Data from this same questionnaire also appear in Sockett and Kusyk (2015) , although this is limited to two graphs: popular reception activities and popular production activities.
4. The category "Other" was left out of this overview analysis due to the contrasting responses given: sometimes it represented unusually high frequencies of 10 or 15 hours of participation per week, while other times it indicated no participation at all (despite the availability of a "Never" option).

About the Author

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