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Hammond, T. and Gil, K.-H. (2025) Formulaic expressions and functional categories in classroom SLA: Evidence from a longitudinal corpus. Instructed Second Language Acquisition, 9 (1). pp. 30-61. ISSN: 2398-4155

https://doi.org/10.3138/isla-2025-0014

Formulaic expressions and functional categories in classroom SLA: Evidence from a longitudinal corpus

This study applies the usage-based notion of 'formulaicity' to examine the nature of the L2 initial through transitional state grammars in taught-classroom settings. Tracking longitudinal production data from nine bilingual Spanish/Catalan pupils (ages 10-17) with limited exposure to classroom English, we observe that evidence for knowledge of L2 functional categories at the initial state is represented by formulaic expressions (FEs) only. Outside of these, learners' production data is consistent with an incremental development of L2 knowledge. We also find a relationship between earlier and more frequent FE use and better knowledge of underlying syntactic properties related to L2 functional categories, which the FEs exemplify. Adopting the Modular Cognition Framework (MCF) (Truscott & Sharwood Smith, 2019), we propose that FEs derived from classroom input in instructed contexts could provide learners with the syntactic distributional evidence necessary to trigger the establishment of L2 FCs. We discuss how these findings can be implicated within traditional debates surrounding the L2 initial and transitional state grammars.

Keywords: formulaic language, instructed classroom second language acquisition, the L2 initial state, interlanguage development, learner corpus research

1 Introduction

This article examines taught-classroom learners' use of 'formulaic expressions' (FEs) and their interaction with corresponding syntactic development over a period of 7 years. FEs in this study refer to strings of language that are potentially not parsed by the interlanguage grammar and hence assumed to be retrieved and produced holistically by learners (e.g., Myles & Cordier, 2017). A salient property of classroom input, FEs are overwhelmingly associated with usage-based (UB) approaches to SLA, which posit an analysis and extraction of their internal parts via general cognitive mechanisms to facilitate L2 creativity (Eskildsen, 2015; 2020; Lesonen et al., 2020; Horbowicz & Nordanger, 2021). FEs have featured less in generative approaches to SLA (GenSLA), as the consensus has been that whilst they are effective communicative tools and can facilitate the learning of lexical items and their collocational relationships, the development of L2 knowledge is constrained independently of their use and/or analysis (e.g., Krashen & Scarcella, 1978; Bardovi-Harlig & Stringer, 2017). This stance largely reflects a traditional tendency of GenSLA studies to explore Poverty of the Stimulus (POS) effects, that is, what learners tacitly know *without* having been exposed to in the input, rather than potential strategies of input manipulation.

However, there is a growing interest within GenSLA to go 'beyond poverty' and examine how quantitative and qualitative properties of the input might contribute to accounts of L2 development (e.g., Yang & Montrul, 2017). Rastelli's Discontinuity Model (2014; 2019) is an exemplary case in point, which offers an innovative hypothesis of how statistical and grammatical learning co-exist and interact in adult SLA under different circumstances during

processing. To continue progress in this regard, it is clear that concepts and methodologies traditionally developed outside of GenSLA need to be explored (Rastelli & Gil, 2018; Rothman et al., 2019), and in doing so, robust findings and competing theories within this paradigm could be re-examined from a different perspective (Rankin & Unsworth, 2016). Given its centrality in UB approaches, and its salience in instructed classroom contexts, the concept of formulaicity could be usefully applied to GenSLA debates surrounding the nature of L2 knowledge at different stages of the acquisition process. The extent to which syntactically complex, prototypical expressions produced by taught-classroom learners are fully analysed or 'formulaic' has a direct impact on competing accounts of the L2 initial state and how transitional state grammars develop thereafter in these contexts. Integral also to UB notions of formulaicity is the gateway it provides to the acquisition of related L2 syntax. This is yet to be analysed empirically under a GenSLA lens[1], where learners' use of potentially formulaic material derived from their input is compared with their corresponding emerging knowledge of underlying syntactic properties. We adopt this procedure with longitudinal data from bilingual Spanish/Catalan classroom learners of English. We analyse spoken production data across four rounds of data collection, ranging from the onset of instruction to 7 years after this, identifying potential FEs and tracking evidence for learners' knowledge of related syntactic properties.

Section 2 first reviews traditional debates surrounding the nature of the L2 initial state before Section 3 introduces our data, the Barcelona English Language Corpus (BELC). Section 4 then shows how FEs were identified in our analysis, and documents our procedure for measuring learners' knowledge of their related syntactic properties from their available

production data across the corpus. Section 5 presents the results of our analysis and Section 6 the discussion. Section 7 gives our conclusion.

2 Setting the scene: Functional categories in L1 and L2 acquisition

Generative linguistic theory makes a distinction between lexical and functional categories. Lexical categories are those elements which carry substantive lexical-semantic descriptive content characterising events, arguments and qualities (i.e. nouns, verbs, adjectives). Functional categories (FCs) are those elements (and morphemes) with a more abstract semantic content which essentially serve to mark grammatical properties such as tense or modality (e.g., determiners, complementisers, auxiliaries etc.) (Radford, 2009). FCs include the functional 'projections', Tense Phrase (TP) and Complementiser Phrase (CP), which contain feature specifications related to individual languages and define the configurational structure in which lexical categories are inserted[2] (Rizzi, 2009, Rothman & Slabakova, 2018).

A long-lasting debate within the generative L1 and L2 acquisition literature concerns the nature of the initial state and how the grammar develops (e.g., White, 2005; 2012). Specifically, there are two positions as to whether FCs are initially realized. One is 'morphology-before-syntax', which relates to traditionally dubbed 'Small Clause' or 'Weak Continuity' hypotheses (e.g., Radford, 1990 for L1, Vainikka & Young-Scholten, 1998; 2011 for L2). Under this view, little or no surface evidence for FCs in production data (e.g., functional morphology, modals and auxiliaries, inversion, wh-questions, complementisers) at the initial state is taken to indicate that these underlying categories are not yet present in grammar. Rather, they are assumed to be in place once more reliable evidence emerges. One version of this position for L2 learners is that lexical categories are immediately available from the L1, but FCs emerge

incrementally, from VP to TP to CP (also known as 'Minimal Trees'), where each stage corresponds to the most 'robust' grammar for a given speaker (Vainikka & Young-Scholten, 1998). Under this view, the acquisition of functional morphology is what triggers the gradual establishment of FCs in transitional state grammars (Herschensohn, 2000; Hawkins 2001).

The other position is 'syntax-before-morphology', where full competence (traditionally dubbed 'Strong Continuity') and access to FCs is assumed from the initial state (e.g., Poeppel & Wexler, 1993 for L1, Schwartz & Sprouse's 1996 Full Transfer/Full Access for L2). The argument is that all categories and features required for fully grammatical derivations are present from the outset, but that these are not mapped onto the right morphological/phonological material yet. Advances in child L1 studies using larger longitudinal samples, cross-sectional samples, and experimental methods suggest some level of sensitivity to FCs at the initial state, even when these are not overt (e.g., Dye et al. 2019). In the L2 literature, studies analysing comprehension and production data at the initial state have shown a dissociation between surface morphology and other more abstract syntactic properties associated with FCs[3] (e.g., Grüter, 2006). For example, whilst tense and agreement morphology remain fairy scarce, properties such as overt subjects and relevant case marking seem to be in place. Furthermore, initial state L2 grammars do often contain surface evidence for knowledge of CP, such as *wh*-questions (e.g., Prévost, 2009). This, along with the general consensus that functional morphology presents the 'bottleneck' of L2 acquisition (Slabakova, 2008), has led the 'syntax-before-morphology' position to be the dominant one within GenSLA (e.g., Jensen et al., 2020).

2.1. The issue of evidence

What is clear from studies on both sides of the debate is that any adopted stance depends on the reliability of performance data and the significance attributed to surface structure phenomena. Disagreement is driven in part by differing stances on how to interpret this, and what counts as reliable evidence for FCs. The absence of overt evidence in production data, for some, does not imply that the underlying syntactic category is unavailable, and hence learners' L2 knowledge can be underrepresented (e.g., White, 2012). However, there is also the issue of overrepresentation (e.g., Myles, 2004). The observation that initial state learners' productions of *wh*-questions show that 'CP is clearly present' (White, 2005, p. 524) is more complicated when the concept of formulaicity is considered. It is now well established, particularly outside of GenSLA, that beginner learners are able to produce complex strings of language which go beyond knowledge of their internal parts (e.g., Bardovi-Harlig, 2009; Myles & Cordier, 2017). This entails that early utterances supposedly demonstrating evidence for CP (such as *wh*-questions) may actually be 'formulaic expressions' (FEs) that are being retrieved and produced holistically, rather than generated online. These kinds of phrases are typically high in frequency, functionality and prototypicality in learners' early L2 input (e.g., Ellis, 2012; Ellis et al., 2015).

For classroom learners, good candidates are conventional expressions that are closely tied to specific communicative contexts and are taught to permit interaction at initial stages of learning, such as *what is your name* or *how old are you* (Towell, 2015). It can be presumed that these expressions, which are introduced holistically in the classroom, are retained this way by learners and provide a pathway to basic routine conversation in the L2. Seminal studies in this regard come from Myles and colleagues, who analysed longitudinal production data from

initial state L1 English adolescent classroom learners of L2 French (Myles et al., 1998; 1999; 2004). They demonstrate how learners produced accurate conventional *wh*-questions such as *quel âge as-tu* ('how old are you'), but could not form these structures in similar functional environments, such as **il âge frere* (he-age-brother) ('how old is your brother'). Revisiting this dataset, Authors (XXX) demonstrate that outside of these conventional question forms, learners' interrogatives in the L2 are mostly lexical and/or constrained by derivational complexity (e.g., Jacobowicz, 2011), showing a lack of wh-fronting and subject-verb inversion. Taken together, these findings suggest that what could be taken as evidence for knowledge of TP and CP at the initial state in the L2 is more likely a result of formulaic material in instructed classroom settings.

2.2. Identifying formulaic expressions in interlanguage development

The identification of potentially 'formulaic' expressions (FEs) is therefore crucial under any GenSLA account of the L2 initial state and the nature of interlanguage development, particularly in instructed classroom contexts. One must determine whether these are reliable evidence of the functional categories and corresponding features/computational properties which they exemplify, or whether these are products of holistic retrieval, and present reliable evidence for either scenario. As FEs typically exemplify a level of fluency and syntactic development that is not found elsewhere in learners' interlanguages, necessary is to compare these candidate expressions to the generative competence of individual learners at a given point of development and thereafter. Consequently, the analysis of oral production data from a group of learners over a significant period of time is necessary (e.g., Doughty & Long, 2003; Myles, 2005; 2015; Verspoor et. al., 2020), rather than case studies following one or two individuals

(e.g., Haznedar & Schwartz, 1997; Lardiere, 1998a;b). Crucially, to most accurately capture individual developmental trajectories, data must be collected and tracked from the same learners over time, unlike cross-sectional designs (e.g., Vainikka & Young-Scholten, 1998; Bhatt & Hancin-Bhatt, 2002). Production data also allows to distinguish the discrepancy between a learner's formulaic and creative utterances, unlike comprehension data. Another important factor for the identification of FEs is the predictability of learners' L2 input. An advantage of investigating taught-classroom settings, in particular foreign language instruction in the learners' L2 environment, is that one can presume the bulk of L2 input comes from the classroom and teaching materials used within this (Rankin & Unsworth, 2016).

Considering these requirements, this study analyses longitudinal production data from a spoken EFL classroom learner corpus, The Barcelona English Language Corpus (BELC). This rich dataset provides a unique opportunity to achieve a more comprehensive picture of the interplay between FEs and the nature of L2 knowledge over a substantial period of time. In this regard, we adopt a mixed-methods analysis to distinguish the following research questions:

i. Can early CP projections (e.g, *wh*-questions) be classified as formulaic? That is, do learners demonstrate knowledge of associated syntactic properties outside of these expressions? If evidence for this knowledge is limited, it is more likely that these expressions are products of holistic retrieval rather than generated by the interlanguage grammar.
ii. How does any classification of early CP projections as formulaic expressions affect the nature of interlanguage development as observed across the corpus?

iii. Is there a relationship between learners' use of any formulaic expressions and associated syntactic development?

3 Methodology

3.1 The Barcelona English Language Corpus (BELC)

The Barcelona English Language Corpus (BELC) was constructed by the Barcelona Age Factor project (Muñoz, 2006) and is available online via its open-access location https://slabank.talkbank.org/access/English/BELC.html. A total of 55 bilingual Spanish/Catalan state-school pupils with limited exposure to English in taught-classroom contexts participated in naturalistic L2 spoken tasks across four rounds of data collection split across four ages. The accumulative hours of instruction (hrs) across the ages are as follows: age 10, 200 hrs; age 12, 416 hrs; age 16, 726 hrs and age 17, 826 hrs. The data can be divided into early years (ages 10 and 12) and later years (16 and 17). In the discussion of the data, we will refer to these data collection stages by age (i.e., age 10, 12, 16 and 17) for ease of exposition, but these groupings essentially reflect the difference in L2 exposure time. The spoken tasks of the BELC have been reported in detail elsewhere (e.g., Muñoz, 2006; Authors XXX). These consisted of a semi-guided interview about the learners' daily life, a narrative task elicited from pictures depicting a story and a role-play task in which pairs of learners had to plan a party. All tasks also included an opportunity for the learners to ask open-ended questions to the interviewer.

Out of the 55 learners which constitute the BELC, we selected nine for our analysis. This is because they were identified as being the only learners to participate across at least three rounds of data collection over the 7-year period. Therefore, these provided the most consistent longitudinal data, allowing for the best opportunity to identify and investigate individual developmental trajectories. In order to control external influences on L2 development to obtain a more comparable dataset, the BELC specified that these learners in the sample did not spend any time abroad in an English-speaking country or have attended out-of-school English classes or have retaken a course grade. This also allowed us to predict FEs that learners were likely exposed to from their principle L2 input inside the state-school EFL classroom.

4 Analysis

4.1 Identifying candidate FEs in learners' transcripts

It is widely agreed that textbooks make up the main and sometimes only source of language input for practice both in and outside the classroom in EFL contexts (Menkabu & Harwood, 2014, Rankin & Unsworth, 2016). Whilst we do not have access to information regarding the exact textbooks that were used in the learners' Catalan state-school classrooms, it is possible to identify beginner textbooks which would be representative of teaching materials used in this context. We analysed two 'local' (Spanish) EFL textbooks (*Challenge for ESO 1* and *Bachillerato Made Easy 1*) and two global EFL textbooks (*New Headway Elementary 4th Edition* and *New English File 2nd Edition*) and extracted the following four prototypical *wh*-expressions that were presented in 'fixed' form to learners in spoken tasks.

(1) a. *what's/is your name*

b. *how old are you*
c. *where do you live*
d. *where are you from*

Under a mainstream generative framework (e.g., Chomsky, 1995; Radford, 2009), these *wh*-questions exemplify various syntactic operations driven by features on functional categories T and C. It is assumed that *wh*-words carry an interpretable *wh*-feature [*i*WH] and finite verbs carry an interpretable tense feature [*i*T], whilst in root interrogatives C carries an uninterpretable interrogative feature [*u*WH] and an uninterpretable tense feature [*u*T]. Nominal syntactic subjects in specifier position of VP carry an interpretable D feature [*i*D], and T also carries an uninterpretable D feature [*u*D]. The [*u*WH], [*u*T] and [*u*D] all carry the EPP (Extended Projection Property), which in English is checked by moving the *wh*-word and finite verb to the specifier and head of CP, and the nominal syntactic subject to the specifier of TP. These syntactic operations are known as *wh*-movement, T-C movement (or subject-verb inversion), and A-movement respectively. A tree diagram is given below to depict this derivation, using *what is your name* as an example.

(Figure 1)

Do-support is also manifested in *where do you live*, with the unhosted abstract affix on T spelled out as an appropriately inflected form of the dummy auxiliary *do* (Radford, 2009). These underlying syntactic operations can manifest not only through *wh*-questions but via a variety of surface structures which are often superficially unrelated. We return to outline these structures in Section 4.2 and discuss how these can be used to measure learners' knowledge of these underlying L2 syntactic properties.

As also reported in Authors (XXX), a manual analysis of the corpus reveals that the extracted *wh*- questions are indeed produced fluently (no repetition, false starts, repairs etc.) by all 9 learners under analysis. Table 1 below shows how the production of these expressions is distributed across the different learners and ages, and demonstrates how they are documented for our analysis. No transcript (NT) indicates that the learner did not participate in that round of data collection, and a dash '–' indicates that a learner participated but was not shown to produce one of these expressions.

(Table 1)

In order to address research question (i) and determine whether these *wh*-questions are likely 'formulaic' for all learners under analysis at a certain point of data collection, it is necessary to analyse the realisations of the expressions' associated syntactic properties (i.e., *wh*-movement, T-C movement, A-movement, *do*- support) outside of learners' use of the expressions. If learners demonstrate limited surface evidence for these properties, this could suggest that these expressions are products of holistic retrieval rather than online generation. Section 4.2 now outlines the surface structures in learner production data that we take to evidence knowledge of these underlying syntactic properties.

4.2 Reliable surface manifestations of the wh-questions' syntactic properties

The strongest evidence for A-movement is overt subjects used in structures which imply a TP projection. Often, learner productions of simple clauses in English are ambiguous between VP or TP projections, as little inflectional morphology is required on the verb. For example, if a

learner produces *I like football*, especially at the initial stages, it is difficult to see unambiguously if the subject pronoun is VP internal or has A-moved to the specifier position of TP, as there is no overt evidence for the presence of T. Equally ambiguous of TP projections in classroom English settings are simple clauses in any conjugation with the auxiliaries *have* and *be* (*I am happy, he has a cold*), as these verbs are often learned in a rote-like formulaic fashion with a personal pronoun (Samian & Tavakoli, 2012). Consequently, we follow previous studies in discounting these forms as evidence for knowledge of functional category T (e.g., Lardiere, 1998a; b; Vainikka & Young-Scholten, 1998), and henceforth refer to such utterances as 'overt subjects in VPs' (OS in VP).

More reliable evidence for A-movement is therefore the use of overt subjects in clauses that unambiguously reflect functional category T. This would be verbs that are overtly inflected for tense, number or person in utterances such as *he likes football, he liked the game*, where a functional morpheme gives more reliable evidence of T and therefore of a TP projection with the A-moved subject as its specifier. Other utterances with overt subjects and overt material in T or C, such as auxiliaries/modals (*he is walking to class, I will go to the cinema, she can draw that picture*), negation/adverb placement (*I do not like sushi, I always read books),* question formation (*where are you going*) and complementisers *(I think that you can go)* can be taken as more reliable evidence of A-movement.

Similarly to *wh*-words occupying a clause-initial position in root interrogatives (as with the FEs), *wh*-movement can manifest in exclamative clauses (2a) relative clauses (2b) and interrogative complement clauses (2c).

(2) a. *what rubbish he would talk!*
b. *it is something which you can do*

c. *I wonder how much money they have*

Evidence for T-C movement in English is the overt inversion of the subject and auxiliary verb (*are you happy, is he sleeping*?) and *do*-support manifests via question formation (*do you have the time? where do you like to eat?*) and negation (*he doesn't like that song, I don't want to go there*). Let us now turn to how we measured learners' L2 knowledge of these computational properties.

4.3 Measuring L2 knowledge of the underlying syntactic properties

As the learners under analysis were taking part in L2 spoken tasks whereby the target language was English, it is important to note that all these tasks were contexts which required L2 usage. However, there exist four possible ways for learners to realise an utterance in these contexts; accurately in the L2, inaccurately in the L2, via translanguaging[4] or in their L1. We have chosen to represent all these possibilities when measuring learners' L2 accuracy of the syntactic properties outlined above, in an attempt to achieve a more precise measurement of learners' L2 knowledge. L2 accuracy rates will therefore be measured as a relative percentage out of manifestations across every context at a given age. To illustrate this process, (3) below shows all realisations of an example learner in contexts which require *wh*-movement in English at age 16 (intended meanings are given in square brackets where relevant).

(3)

a. *¿Qué te gusta comer?* [what do you like to eat?]

b. **go there when?* [when do you go there?]

c. *what do you want?*

d. *Por qué he not like?* [why does he not like it?]

e. *I like el equipo que ganó* [I like the team who won]

f. *when can I go?*

Out of these 6 contexts where *wh*-movement is required to manifest in English, only two utterances are accurate in the L2 (c, f), one is in the L1 (a), two are realised via translanguaging (d, e) and one is ungrammatical in the L2 (b). The accuracy rate of *wh*-movement for this learner at age 16 would therefore be 33.3%, as they realise two accurate utterances out of six possible contexts. Note that, in deciding what structures constitute evidence for the computational properties, this method of measuring learner's L2 accuracy is quite conservative. This is because we believe that discounting L1 and translanguaging utterances would lead to issues of reliability/inaccurate scores, as we would be ignoring a large proportion of learners' productions. Based on the *wh*-movement example above, if we were to measure L2 accuracy as a relative percentage of the learner's L2 utterances only, we would get a much higher accuracy rate of 66.6% (2/3). We believe this to be a somewhat misleading figure, when it is considered that in 50% (3/6) of contexts where *wh*-movement is required in English, the learner reverts to realising the utterance in their L1 or via translanguaging. This, taken together with their inaccurate L2 utterance, constitutes 66.6% (4/6) of contexts in which the learner fails to realise *wh*-movement accurately where required in the L2.

Section 5 now presents the results of the longitudinal data analysis to address research questions (i) – (iii) as outlined in Section 2.

5 Results

In addressing research question (i), we find that at the ages where the *wh*-questions first appear in learners' transcripts, there is limited evidence for knowledge of associated syntactic properties elsewhere in their interlanguages. In relative terms, this is in fact close to 0% in most learners' cases (see Appendix 1). We use Learner 38 as a representative example. This learner produces *what's your name* and **where you live* fluently for the first time at age 12. Except for these *wh*-questions at this age, their interlanguage predominantly consists of single lexical items in the L2 as below:

(4) a. *one past half*
b. *seven*
c. *hm (.) hm the farm*

They do show some accurate use of overt subjects in the L2, but in these instances inflection is not visible on the lexical verbs (5). Therefore, these instances might be better interpreted as bare VPs at this stage, rather than evidence of functional category T.

(5) a. *they go*
b. *they play football*
c. *I play football*

Further evidence for a lack of TP projection comes from utterances like those in (6) when inflection is required on the verb and Learner 38 consistently fails to realise this accurately in the L2.

(6) a. **her mother prepare*
b. **the dog see the sandwiches*
c. **her dog hm eat the food*

There is no evidence for knowledge of functional category C in the L2 at this age. Interrogatives are realised with L1 *wh*-words in isolation (7), via translanguaging (8) or with lexical categories of the L2 and assumed rising intonation (9).

(7) a. *com?* [Catalan] (how?)

b. *que?* [Catalan] (what?)

(8) **when friends I conviden?* (how many friends do I invite?)

(9) a. *house in my house?* (is it in my house?)

b. **you prepare the my birthday?* (have you prepared for my birthday?)

For all learners, there is a clear discrepancy between their initial fluent productions of the *wh*-questions and all other L2 utterances, as exemplified with Learner 38 above. In answering research question (i), this is reasonable evidence to suggest that the *wh*-questions in these instances are indeed 'formulaic', that is, memorised products of holistic retrieval, rather than computational derivation. We will henceforth refer to these *wh*-questions as such (FEs).

In order to address research question (ii), when measuring the trajectory of learners' L2 development over the four data collection rounds, it is therefore necessary to exclude the FEs as reliable evidence for knowledge of their related computational properties and associated functional categories. When comparing learners' L2 accuracy rates of these properties outside of the FEs at ages 10, 12, 16 and 17 respectively, we observe that these increase incrementally across the four ages. At ages 10 and 12, L2 utterances largely consist of single NPs (*dog, mother, farm* etc.), and grammatical L2 utterances which contain verbs are either suppletive forms or those which show no overt evidence for functional category T (OS in VP). Any

evidence for learners' knowledge of the computational properties and functional categories T and C in the L2 begins to appear at age 16. The line graph in Figure 1 below demonstrates this, showing learners' mean L2 accuracy rates as relative percentages.

(Figure 2)

Indeed, we find a significant increase in learners' L2 accuracy on these properties at ages 16 and 17 (M = 43.66%, SD = 28.75%) from those at ages 10 and 12 (M = 0.55%, SD = 0.73%); $t(8) = 4.54$, $p < .05$ (two tailed). On average, it is learners' L2 accuracy of those properties associated with functional category T (A-movement) that increase the most at age 16, whilst those associated with functional category C (T-C movement, *wh*-movement) start to show higher levels at age 17. *Do*-support is also more accurately manifested in structures with negation (TP) as opposed to those with question formation (CP).

In order to demonstrate the progression of these computational properties, Tables 2 and 3 below display Learner 38 and Learner 42 as representative examples of the observed developmental trends. In each table, the second row shows their FE productions while the third row includes some of the typical L2 utterances that are found outside of the FEs at each of the four ages. In the third row, '//' is added to separate each utterance unit. These utterances demonstrate a clear progression from lexical (NPs, bare VPs) to functional category (TPs, CPs) knowledge between the ages 12 and 17.

(Table 2)

(Table 3)

The typical utterances exemplified in the tables above show that, outside of the FEs, there is very little evidence for surface phenomena such as auxiliaries, inflectional morphology, negation or question formation in learners' production data at age 12, and considerably more so at ages 16 and 17.

In addressing research question (iii), that is, the relationship between FE use and syntactic development, we observe intra-learner variation within L2 accuracy rates at the later ages (16 and 17) (note the large standard deviation at these ages; $M = 43.66\%$, $SD = 28.75\%$). It is clear from Tables 2 and 3 above, for example, that Learner 38's interlanguage is more progressed at the later ages (16 and 17) than that of Learner 42. Learner 38 is also shown to produce two FEs at age 12 (*what's your name, *where you live*), whilst Learner 42 fails to produce any until age 16 (*what is your name, where are you from*). At ages 16 and 17, Learner 38 produces a variety of utterances which demonstrate knowledge of functional categories T and C (incl. *can I do it, why are you doing this work, I think that we have five rooms*), whereas Learner 42's interlanguage at these ages – whilst clearly more developed from the earlier ages – shows far less evidence of these L2 functional categories and often makes errors where these should manifest (incl. **mother say goodbye* …).

This trend is consistent across all learners under analysis; significant differences were observed between L2 accuracy rates for learners who produced an FE at the early ages (age 10 and 12) ($M = 61.2\%$, SD = 24.8%) and those who failed to do so until the later ages (age 16 and 17) ($M = 22.3\%$, $SD = 14.2\%$; $t\,(7) = 2.95$, $p = <.05$). The four graphs in Figures 2–5 below illustrate this. The blue line shows the mean L2 computational property accuracy rates of those

learners who produced FEs at ages 10 and 12 (Early FE Learners), and the orange line shows the mean rates of those learners who failed to produce an FE until age 16 (Later FE Learners). The green bars show the mean average of all learners.

(Figure 3)

(Figure 4)

(Figure 5)

(Figure 6)

The graphs show how all learners progress through a similar developmental trajectory from lexical to functional category L2 accuracy, but those with early and frequent FE use are quicker to achieve higher L2 accuracy rates. Correlations were identified (Tables 4 and 5) between a higher L2 accuracy of the syntactic properties at the later ages[5] and (i) a younger age of first FE production, and (ii) a more frequent production of the FEs at the initial rounds (ages 10 and 12). Note that these would be considered significant in accordance with bootstrapped confidence intervals and at the adjusted alpha level of .10 and .15 as recommended for small sample SLA studies (e.g., Stevens, 1996; Larson-Hall, 2016; Larson-Hall & Mizumoto, 2020).

(Table 4)

(Table 5)

503 In addressing research question (iii), we can therefore identify a relationship between earlier
504 and more frequent FE use and a higher L2 accuracy of the syntactic properties for which the
505 expressions exemplify. Section 6 now presents a discussion of the analysis.
506

507 **6 Discussion**
508

509 Our results demonstrate that the categorisation of complex L2 expressions as 'formulaic' has
510 direct consequences for the nature of instructed learners' L2 initial state and how development
511 proceeds through their transitional state grammars. At the initial rounds (ages 10 and 12),
512 accuracy of L2 surface forms which exemplify manifestations of L2 FCs (T & C) are
513 represented by formulaic expressions (FEs) only, as derived from their taught-classroom input.
514 All other L2 productions appear to be lexical in nature; the majority of these take the form of
515 single NPs (*cat, mother, repeat*) and subject-less/uninflected VPs (* _ *go to the cinema, *the*
516 *mother read the map*). The only grammatical L2 utterances at these ages contain lexical verbs
517 with first person subjects and hence do not require inflection (*I play football*), which could be
518 analysed as bare VPs on account of their ambiguous structural nature and existence within a
519 predominantly lexical-based L2 grammar. Accurate L2 utterances demonstrating knowledge
520 of the FEs' computational properties, which provide more substantial evidence for knowledge
521 of L2 FCs, (including overt subjects with auxiliaries, inflected lexical verbs, negation, question
522 formation, complementisers etc.) start to appear at ages 16 and 17. Correlations are found
523 between a more frequent use of the FEs at early ages, and a higher knowledge of related L2
524 FCs at the later ages. Emerging knowledge of L2 FCs is evidenced through a variety of surface
525 structures that are often superficially unrelated.
526

The observation of this correlation, made possible only through the analysis of dense, longitudinal data, is one that warrants further attention. Unlike usage-based approaches, GenSLA has traditionally dismissed the role of FEs as peripheral communicative phenomena existing independently of L2 syntactic acquisition, which has its own developmental trajectory (e.g., Krashen & Scarcella, 1978; Bohn, 1986; Carroll, 2010; Bardovi-Harlig & Stringer, 2017- although see Rastelli (2019) for an alternative stance). Indeed, in terms of L2 accuracy rates, we observe an incremental developmental trajectory which is consistent across all learners. However, the observed relationship between FE use and higher L2 accuracy rates suggests that FEs could influence the 'rate' in which learners progress through this trajectory. Therefore, it could be that, over time, use of the FEs provides learners with the morphological and syntactic distributional evidence necessary to trigger the establishment of L2 FCs and their feature values in the interlanguage grammar. This concept has been mirrored in L1 studies examining children's earliest utterances for evidence of FC 'determiner'. For example, Szagun & Schramm (2016) analysed German L1 data and found that determiners were first present in multiword utterances, before their associated syntactic information of case and gender were generalised over different items of the noun class. This implies that, what starts out as formulaic and initially unanalysed, may eventually become analysed and feed into/influence the underlying grammatical system as classroom learners' exposure to and interaction with the target language increases (e.g., Myles et al. 1999; Myles 2004; 2015).

Further exploration of this concept could be an interesting area of inquiry for GenSLA studies concerned with the influence of input properties and language usage on the acquisition of underlying L2 syntax. Existing models that are centred around the interaction between statistical and grammatical learning in SLA more generally could provide useful theoretical

551 points of departure in this regard (e.g., Rastelli, 2014; 2019; Truscott & Sharwood-Smith,
552 2019). Specifically, the Modular Cognition Framework (MCF) (Sharwood Smith & Truscott,
553 2014; 2019)[6] adopts a processing approach to acquisition based around notions of 'competition'
554 and 'activation'. We now briefly sketch how this framework could be applied to our data and
555 the consequences this has for debates surrounding the nature of the L2 initial and transitional
556 state grammars, particularly in instructed settings.
557
558 The MCF distinguishes an innate architecture split into a Conceptual Store (CS), which
559 handles all abstract meanings in general working memory, and the specific linguistic systems,
560 namely the Phonological Store (PS) and the Syntactic Store (SS). 'Processing' refers to the
561 construction of representations in each store, where representations are 'activated' either
562 through external stimulation or through spreading activation within its store. The 'current
563 activation' level is the extent to which a representation is available for current processing, and
564 its 'resting activation' is the level it has when not involved in processing, but this level reflects
565 the extent of its past use (Truscott, 2017). This means that with continuing use/stimulation, a
566 representation's resting activation level is raised. For an L2 learner, processing in one language
567 activates items in both the L1 and L2, including functional categories (FCs) with their features
568 and feature values (Sharwood-Smith & Truscott, 2006). When an L2 utterance is being
569 comprehended or produced, this leads to parallel activation of CS/PS/SS chains in working
570 memory, and current activation levels determine which set of competing items (L1 or L2) is
571 selected for these representations (Sharwood-Smith, 2021). The higher the resting activation
572 level of the L2 syntactic representations, for example, the better position they are in to compete
573 with the L1 representations that initially dominate the SS (Sharwood-Smith & Truscott, 2014).
574

In instructed settings, compared to FCs, substantive lexical content and conventional formulaic expressions are perhaps initially more susceptible to conceptual encoding, given their high salience, contingency and prototypical functionality in the L2 classroom input (e.g., Ellis, 2022). It is now well established that learners prioritise lexical over functional content during the processing of L2 input (e.g., Sato et al., 2025), and that typically in taught-classroom contexts, rote-learned FEs constitute a major part in role-play activities to permit interaction at initial stages of learning (Nattinger & DeCarrico, 1992; Mitchell & Martin, 1997; Towel, 2012; Myles & Cordier 2017). Specifically, we propose that these FEs at the initial state (like those observed in the present study) could be analysed as conceptual representations in CS which are mapped to conventional communicative functions, such as [ask name] and [ask age] (see Myles 2004 for a similar discussion). This meaning-function mapping is likely aided by non-linguistic factors, such as metalinguistic knowledge derived through classroom instruction[7]. Thus, compared to FCs, lexical categories and prototypical FEs would be quicker to achieve higher activation levels and better compete with the existing L1 ones at the earliest stages of acquisition in classroom contexts.

Applied to our data, this could explain why lexical categories/FEs are the only accurate L2 utterances observed at the initial rounds of data collection (ages 10 and 12), whilst ungrammatical L2 utterances and L1 utterances dominate where L2 functional categories are usually required. Under the MCF, this is a consequence of learners' long-term exposure to L1 forms in these environments and therefore the higher resting activation levels of L1 representations that compete for inclusion on a single, shared processing chain. This competition is also why many of the ungrammatical L2 utterances at these stages seem to be influenced by the learners' L1 (Spanish); for example, VPs with null subjects. Note that this is

599 a radically alternative view of 'transfer' compared to traditionally competing accounts of the
600 L2 initial state, which essentially posit a 'cloned' L1 (whether in full or in part) (e.g., Schwartz
601 & Sprouse, 1996; Vainikka & Young-Scholten, 1998).
602
603 Analysing the FEs as CS representations also means that over time and with frequent usage in
604 appropriate contexts, the increased activation of the FEs as CS representations has a growing
605 influence on activity in the syntactic module (SS)- meaning that the L2 linguistic information
606 that the FEs realise eventually becomes available to the learner. This could be one reason why
607 we observe a relationship between more frequent usage of FEs at the initial state and better
608 later knowledge of their underlying syntactic properties. In this sense, transitional state
609 grammars can be seen as a gradually increased competition between L1 and L2 activation
610 levels in the SS, perhaps scaffolded by frequent use of CS representations (such as the FEs)
611 that exemplify underlying L2 feature values and functional categories over time. Further
612 justification for this concept is that, in order for the syntactic processor to write a particular
613 category/feature in the SS, it must recognise that this category is needed to handle the L2 input.
614 Without considerable lexical and/or syntactic distributional evidence (which the FEs can
615 provide), this would be difficult, and hence, the acquisition of some substantive L2 content
616 words and their syntactic characteristics must necessarily precede the development of FCs in
617 order for these to achieve the required activation levels (see also Truscott & Sharwood-Smith
618 2004; Sharwood-Smith & Truscott, 2014).
619
620 Therefore, what initially seem like conflicting notions under traditional accounts (i.e. evidence
621 of L1 transfer *and* incremental emergence of L2 FCs), make sense when the potential effect
622 of FEs is considered under the MCF's conceptualisation of acquisition as a 'lingering effect of

processing' (Truscott & Sharwood-Smith, 2004 p. 4). Fundamentally, our analysis highlights the importance of identifying FEs in early learner data, both for a more accurate understanding of the nature of their L2 knowledge at this stage and how this may progress thereafter. Further engagement with these notions could potentially open up fruitful new avenues for exploration on a debate that continues to persist in SLA.

Finally, a brief note on the limitations is in order. Although our sample of nine learners is considerably large compared to similar longitudinal SLA case studies (e.g., Haznedar & Schwartz, 1997; Lardiere, 1998a;b; Eskildsen, 2015; Horbowicz & Nordanger, 2021), we recognise that the generalisability of our results to the wider L2 population should be treat with caution. Similarly, as with any learner corpus study, the BELC constitutes only a fraction of learners' productive capabilities in English at particular points in time. Therefore, as discussed in Section 2, the presence/absence of surface forms in this production data may not necessarily reflect their corresponding knowledge or lack of such, meaning that any links drawn between our data and the minds of learners should be tentative (Siyanova-Chanturia, 2015).

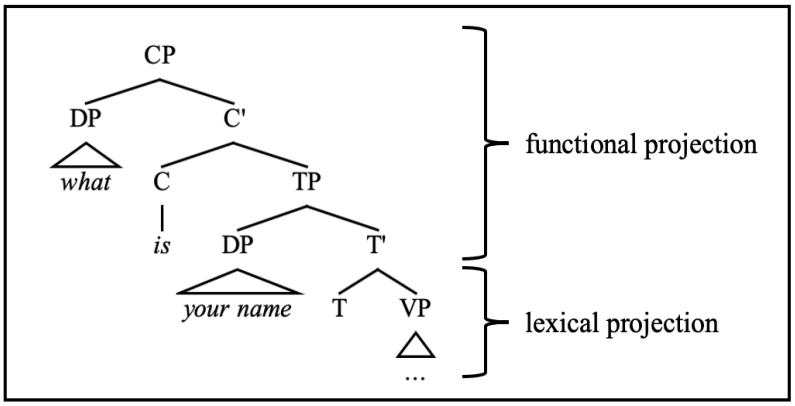
7 Conclusion

This study has applied the usage-based notion of formulaicity to a classroom longitudinal learner corpus to discover trends in interlanguage development. Accurate L2 utterances at the initial state seem to consist of memorised FEs and lexical categories only, before more evidence of L2 FCs emerges incrementally and in conformity at later ages. Individual differences between learners' knowledge of FCs seem to relate in part to their initial use of memorised FEs derived from their classroom input. It could be that frequent use of complex FEs over time

provides learners with the necessary syntactic distributional information needed to trigger the emergence of related FCs in the L2. We have highlighted this as an interesting area of inquiry for more input-oriented GenSLA research and suggested that processing approaches to acquisition based around the interplay between statistical and grammatical learning, such as the MCF, could be productive theoretical frameworks in which to investigate this relationship.

Notes

1. However, see Rastelli (2024) for a theoretical discussion regarding how formulae could feed into grammar based on a statistical model within the generative framework.
2. For those readers who are less familiar with the generative framework, we have included a simplified tree diagram below depicting the functional (CP, TP) and lexical projection (Verb Phrase (VP)) assumed to be involved in the generation of the *wh*-question *what is your name*. These phrases are first assembled under the VP and moved to the functional projections CP and TP. The detailed derivation by movement is also discussed in section 4.1 and schematised in Figure 1.



3. This dissociation has also been shown to persist with some end-state learners (e.g., Lardiere, 1998a;b).

4. Note that we adopt the term ‘translanguaging’ rather than ‘code-switching/mixing’. This is because in the learning context under analysis, use of the L1 in utterances such as (3-e) are likely a ‘fallback’ strategy used to communicate meaning, rather than constrained alternations occurring at specific points in communicative episodes (Przymus, 2024). That said, (3-e) could be classed as an instance of intra-sentential codeswitching, if looked at objectively.
5. All mean accuracy rates at later ages can be seen in Appendix 2, with raw figures and relative percentages.
6. This is an updated model based on the Modular Online Growth and Use of Language (MOGUL) (see for example Truscott & Sharwood-Smith, 2004).
7. Metalinguistic representations in the MCF are also taken to be formulated as conceptual representations, rather than specific linguistic ones (see Sharwood Smith 2021 for a discussion).

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Work on this article has been supported by the White Rose College of the Arts and Humanities Award (WRoCAH). This support is gratefully acknowledged. Earlier versions of this paper were presented at GASLA 16 and LAGB 2022, and we are appreciative for feedback from audience members. We also thank two anonymous reviewers for helpful comments on an earlier draft.

Competing interests: The author(s) declare none.