Syntactic Development across Genres in Children's Writing:
The Case of Adverbial Clauses

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Abstract: Corpus linguistic methods can provide detailed and statistically robust information about how children's written language develops as they progress through their education. Such data can inform both models of written language development and curricular policies and practices. To this end, the current paper focuses on *subordination* as a key site of syntactic complexity. Using a corpus of 240 texts written by children aged 6 to 16 in England as part of their regular school work, it quantifies how the most common type of subordinate clause (the adverbial clause) varies across year groups and genres in terms of frequency, internal complexity and semantic function. A complex developmental picture emerges with length and frequency of finite vs. non-finite clauses changing in distinct ways across primary vs. secondary education. These patterns are found to be closely related to discipline- and genre-specific developments in the main functions for which adverbial clauses are used.

A key contribution that applied linguistic research can make to education is that of increasing our understanding of how children's written language changes as they progress through their school careers. Language in general, and writing in particular, is a sophisticated tool for construing experience, for thinking, learning and developing ideas, and for relating to other people. Understanding its development thus provides a window onto the development of thought, knowledge and social identity. Language is also a fundamental resource through which education is achieved, and children's educational success depends in fundamental ways on their mastery of language and of the ways in which language can be shaped to meet the demands of particular contexts and purposes. Understanding how children's mastery of written language develops through the course of their education is, therefore, a powerful way of understanding their broader educational development.

On a more directly applied level, teachers and curriculum designers are often called upon to make decisions about how the linguistic focus of teaching should be structured. It is important that such decisions are made with as much knowledge as possible of how written language develops. Development is, of course, never independent of the curriculum itself: the language that children write is influenced by what they have been taught and the types of writing they are asked to do. We cannot, therefore, provide a neutral description of how children's language develops in the wild and shape our teaching to that (even if such an approach were desirable, which is open to debate). However, we can learn about what language development looks like within particular curricular regimes. This gives insight both into the outcomes of our current practices and, where curriculum and outcomes fail to align, into possible constraints on those outcomes.

Modelling writing development is not a straightforward task. Writing ability is, as many researchers have emphasized (e.g. Alamargot & Fayol, 2009; Grabe & Kaplan, 1996; Hayes, 2012), a highly complex construct. A competent writer needs, amongst other things, lexico-grammatical knowledge, discourse knowledge, knowledge of the world in general and of the topic on which they are writing in particular, an understanding of how texts are conventionally structured and phrased in particular genres, an ability to plan and organise ideas, to transcribe language orthographically and to maintain motivation for a sustained writing task. Any written text that a learner produces relies on the complex interaction of such knowledges and abilities within a particular social and physical context comprising, for example, short- and long-term goals, time constraints, social resources such as access to a teacher, peers or reference materials and the hardware of writing such as pens and paper, computers, chairs, tables etc. This dense web of interacting factors means that the influence of any part of writing ability on the production of texts is highly mediated, making it difficult to trace the development of particular components of that ability in an ecologically valid way.

One means of building a picture of writing development is to study changes in the written products themselves; that is, to study the outcomes of the whole complex writing process. Studying texts as products does not allow us to draw firm inferences about any particular component of writing ability; rather it shows us the state of the system as a whole. Since the ultimate aim of education is to develop the child's overall ability to write, rather than to develop particular elements within the system, such an approach has strong educational validity. While written products could be usefully studied in any number of ways, a key method is to study texts' linguistic makeup. Language is, after all, at the heart of writing, and the analytical tools of linguistics can therefore offer a powerful analytical lens for understanding how writing changes developmentally.

Previous research along these lines has shown that linguistic development in school-aged children's language is not primarily about the emergence of new syntactic elements. Children appear to have access to the core grammatical structures of English by the time they start school (Applebee, 2000; Hoff, 2009). Instead, a key change concerns their "ability to manage an increasing degree of structural complexity" (Applebee, 2000, p. 97). In a tradition stretching back several decades, this emerging complexity has been studied in terms of the frequency with which particular linguistic structures are used and the internal complexity of those structures (e.g., Grobe, 1981; Hunt, 1965; Loban, 1976; Yates, Berninger, & Abbott, 1995). Such work has gathered significant pace since the 2000s and the spread of computer-assisted corpus linguistic methods, which have enabled researchers to study children's language use on a scale, and with a level of reliability, which was not previously practical (e.g. Crossley, 2020; Durrant, Brenchley & McCallum, in press).

The approach taken in this article agrees that quantitative corpus research is an excellent means of identifying consistent developmental patterns across large sets of data. However, it is also important to recognise that language is functional and that variation in the use of linguistic features is a product of the types of meanings which writers create (Christie & Derewianka, 2008). This is crucial because development in written language use is not simply, or primarily, a matter of increasing formal complexity; it also involves a growth in semantic variation and complexity, which formal complexity serves to reflect. Work of the sort just described is therefore at its most effective when complemented by qualitative investigation of the meanings which underlie quantitative patterns. This approach is capable of providing both a bird's-eye view of language development and a thick description of what that development looks like and of the functional changes that account for it.

The broader project, of which this study is part, digitized approximately 3,000 texts written by children aged six to sixteen at schools in England. While publications to date have focused on variation in the use of vocabulary (Durrant &

Brenchley, 2019) and collocation (Durrant & Brenchley, in press), the present study is the first to look at syntactic variation. In particular, it will aim to track changes in the use of adverbial subordinate clauses. Our decision to focus on subordination rests on a long-standing tradition which associates increased subordination with increased complexity in written syntax (Beers & Nagy, 2009), making it an intuitive candidate for developmental significance. Adverbial clauses in particular were chosen as these turned out to be, by far, the most commonly-used form of subordination in our corpus. This suggests that they are likely to play important developmental and functional roles in children's writing.

1. Subordination, Syntactic Complexity, and Adverbial Clauses in Children's Writing

Subordination plays a central role in English teaching in the context where this study was conducted. The 2014 National Curriculum for England (Department for Education, 2014), which mandates the content to be covered at each stage of a child's education, makes frequent reference to features of subordination throughout the years of primary education, as Table 1 summarises. After Year 1 (where clause combining is restricted to co-ordination), each year's content makes some reference to subordination (even though this is sometimes only implicit, as in the introduction of conjunctions and prepositions at Year 7 and the introduction of fronted adverbials at Year 4). The Secondary Curriculum does not cite specific features that need to be introduced. However, a strong focus on grammar remains. Children "should be taught to…consolidate and build on their knowledge of grammar and vocabulary through…drawing on new vocabulary and grammatical constructions from their reading and listening, and using these consciously in their writing and speech to achieve particular effects" (Department for Education, 2014, p. 84 & 87). The goal is therefore that children's overall grammatical repertoire and their ability to deploy that repertoire effectively should continue to develop throughout the secondary years.

Subordination has also been a popular theme of child writing research. This may be partly because it is so salient as a readily observable feature of texts. Perhaps more important though, is the intuitive association between subordination and notions of *syntactic complexity*. Syntactic complexity is a much-used, but seldom defined, construct. Tacitly, most studies subscribe to the idea that complexity is a product of the number of component parts within a feature and the number and nature of connections between those parts (Bulté & Housen, 2014). Defined in these terms, it is easy to see increased use of subordination as a prime example of increased complexity since more subordination implies sentences with a larger number of interconnected parts.

We study syntactic complexity as a formal, structural feature of language in texts. This must be distinguished from *relative complexity*: the subjective difficulty of a

particular feature. Relative complexity relates to the "cost and difficulty of processing or learning" (Bulté & Housen, 2014, p.43) a feature and, while this may be influenced by formal structural complexity, it is also a product of learner variables, such as age and motivation, and of a feature's salience and frequency in the linguistic environment. Syntactic complexity also needs to be distinguished from writing quality. As Beers and Nagy (2009) note, more complex does not necessarily imply better. In the right place, simple sentences can be the most powerful (Myhill, 2008).

Table 1. Subordinate clauses in the National Curriculum for England (Dept. for Education, 2014)

Year	Ages (years)	Content
1	5-6	How words can combine to make sentences Joining words and joining clauses using *and*
2	6-7	Subordination (using *when, if, that, because*) and co-ordination (using *or*, and, *but*)
3	7-8	Expressing time, place and cause using conjunctions [for example, *when, before, after, while, so, because*], adverbs [for example, *then, next, soon, therefore*], or prepositions [for example, *before, after, during, in, because, of*]
4	8-9	Fronted adverbials [for example, Later that day, I heard the bad news.]
5	9-10	Relative clauses beginning with *who, which, where, when, whose, that* or an omitted relative pronoun.
6	10-11	The difference between structures typical of informal speech and structures appropriate for formal speech and writing [for example…the use of subjunctive forms such as *If* I were or *Were they to come* in some very formal writing and speech]

However, as Beers and Nagy (2009) also note, increased complexity does enable writers to express more complex ideas and relationships between ideas more succinctly. There is thus good reason to think that the more complex meanings which children are expected to create as they mature will be reflected in greater overall syntactic complexity.

Much research on subordination to date has relied on Hunt's (1965) concept of *clause density*. This is defined as the ratio of all main and subordinate clauses to all t-units, where t-units are defined as main clauses plus their dependent subordinate clauses. A higher clause density indicates a higher number of subordinate clauses for each main clause. Most studies using this measure have observed increased use of subordination as children mature (Crowhurst & Piche, 1979; Golub & Fredrick,

1970; Grobe, 1981; Hunt, 1965; Myhill, 2008; Rubin, 1982; Rubin & Piché, 1979; Sun & Nippold, 2012; Veal, 1974; Verhoeven et al., 2002; Wagner et al., 2011).

While clause density is a simple, and apparently reliable, index of syntactic maturity, it is limited in that it gives only a coarse-grained picture of language use. Subordination is a cover term for a range of grammatical features, including adverbial clauses, relative clauses and complement clauses. Moreover, each of these includes a further diverse range of structures with potentially quite different developmental profiles: finite and non-finite clauses; complement clauses as subject or object of a verb, as object of a preposition, or as noun complement, etc. This lack of granularity may be part of the reason for the success of Hunt's measure. By averaging across a range of more detailed features, much of the variability inherent to contextualized language use disappears. However, the trade-off is a less informative and less sensitive picture that may conceal important developmental patterns (Biber, Gray, Staples & Egbert, 2020 provide a useful discussion of this issue).

This underlines the need for more fine-grained studies of subordination, and a small number of studies have looked at how particular clause types vary in use across children at different ages. Harpin (1976) and Noyce and Christie (1985) both studied the use of adverbial clauses by children near the start of their educational careers - the former comparing writing in Years 3 and 6 in the UK and the latter comparing Grades 3 and 5 in the US. Both found an increase in use across these year groups, though neither subjected their figures to an inferential analysis. Studies looking at older cohorts have not found similar increases. Nippold, Ward-Lonergan and Fanning (2005), who compared writing by US students in Grades 5/6, those in Grades 11/12 and adults found no difference between groups, while Sampson (2003), who compared the writing of 9 to 12-year olds in the UK with that of adults found a significant decrease in the prevalence of adverbial clauses.

Taken together, these studies hint at an initial increase in the use of adverbial clauses in the primary school years, followed by a levelling off, or decrease, as children progress through secondary education and into adulthood. However, the small number of studies involved, and the lack of inferential analyses in the primary school studies, make this pattern speculative. While it is possible that the primary/secondary contrast is due to a genuine age effect, equally, it may well be due to peculiarities of the individual studies. A particular issue is the potentially important variable of text genre. There is independent evidence that children use more adverbial clauses in their narrative writing than in their non-narrative writing (Berninger, Nagy, & Beers, 2011), so this is likely to be a confounding factor in developmental studies. Harpin (1976) describes the texts in his corpus as a mix of creative and factive, Noyce and Christie (1985) as free writing that is predominantly narrative and Nippold et al. (2005) as persuasive, while Sampson (2003) provides no information at all. This blend of uncontrolled, multiple and undifferentiated genres

within studies, and divergent labels for what may be the same thing (c.f. creative vs. narrative) between studies makes unpacking any effects impossible.

A further set of studies has looked more specifically at the category of finite adverbial clauses. However, this literature offers few clear conclusions. O'Donnell, Griffin and Norris's (1967) study of writing by children in Grades 3, 5 and 7 in the US appears to cohere with the primary increase vs. secondary plateau distinction suggested above, finding a significant increase from Grades 3 to 5 but no change between Grades 5 and 7. An increase at primary level is also found by Thomas, Nemanich and Bala (1967) between Grades 3 and 6. However, if the primary increase is real, other studies suggest that it must be constrained to the earliest stages. Studies tracing development from Grade 4 found no development by Grades 6 (Golub & Frecerick, 1965) or 8 (Hunt, 1965). Studies of post-primary writing tend to agree with O'Donnell et al. (1967) that there is no increase at these ages (Blount et al., 1967; Hunt, 1967). Only Thompson, Nemanich and Bala (1967) buck this trend, showing an increase between Grade 6 and adults. However, they do not support their findings with an inferential analysis. As with the general adverbial clause studies reported above, it is not possible to determine the possible effect of genre on these findings. While O'Donnell et al. (1967) and Thompson et al. (1967) both study narrative texts, the other studies do not specify their genres.

Overall, therefore, although subordination in general and adverbials in particular feature prominently in the National Curriculum guidance, and although previous research has suggested some interesting patterns of development, it is not possible to draw clear conclusions from the current evidence base about how frequency or complexity of adverbial clauses varies with age. There is some hint of a primary-school increase in frequency followed by a secondary-school plateau, but the small number of studies, lack of inferential analyses, and failure to control for text genre make this conclusion highly speculative. Evidence for finite adverbial clauses is still less clear, and we have not been able to find any evidence regarding non-finite clauses. Also missing from the literature is an interpretation of how children use adverbial clauses and what any possible quantitative patterns signify about how their functional use of language changes as they progress through school.

The current study therefore aims to add to our understanding in this area by investigating how the frequency and internal complexity of adverbial subordinate clauses develops across year groups in the writing of school children in England, how this development is moderated by genre and how it reflects functional changes in the messages that children convey.

2. Methodology

2.1 The Corpus

This study is based on a corpus of children's writing collected from schools in England[1]. All writing was produced as part of children's regular school work and was collected with consent from students, their legal guardians and their schools and with the approval of the first author's institutional ethics committee. The full corpus comprises approximately 3,000 texts collected from approximately 1,000 children in 24 schools and was sampled across the disciplines of English, Science, and Humanities (i.e. History, Geography, Religious Studies) from children at the ends of Key Stage (KS) 1 (Year 2, when children are 6-7 years old), KS2 (Year 6, when children are 10-11 years old), KS3 (Year 9, when children are 13-14 years old) and KS4 (Year 11, when children are 15-16 years old).

Texts were classified as either *literary* or *non-literary* in genre. Literary texts are those which can be evaluated as successful or unsuccessful without considering their propositional or directive relationship to the world. That is, their contents do not need to be judged as either factually accurate or as making a persuasive argument in order to be considered successful. Literary texts are written primarily to be appreciated in their own terms as pieces of stylised writing. Prototypical examples include creative fiction and literary imitations (Durrant & Brenchley, 2019). Non-literary texts, in contrast, do need to bear a propositional or directive relationship to the external world to be considered successful. Their main purpose is to accurately describe, evaluate or argue for a particular state-of-affairs. Prototypical examples include autobiographies, complaint letters and experimental reports. This classification was preferred over existing frameworks (e.g. Nesi & Gardner, 2012; Rose & Martin, 2012) as we found that these could not be reliably applied across disciplines and year groups (Durrant & Brenchley, 2019). Classifications were made based on our understanding of the tasks that were set, rather than on analysis of the texts themselves.

The present study required texts to be hand-coded for syntactic features as automated parsing software (Manning et al., 2014) did not prove to provide a sufficiently accurate means of identifying forms of interest. As the labour-intensive nature of this work prohibited our using the full corpus, this study was based on a stratified random sample of 240 texts; 30 literary and 30 non-literary texts from each year group. With the exception of Year 2, in which Science texts were rare, non-literary texts were equally sampled between English and Science disciplines. All texts from Year 2 were from English classes. The contents of the sampled corpus are summarised in Table 2.

Table 2. Sampled corpus

Year	Genre	Number of				Mean words/text
		Texts	Writers	Distinct topics	Schools	
2	Literary	30	29	9	3	83.87
	Non-Literary	30	25	9	3	55.90
6	Literary	30	29	12	5	316.20
	Non-Literary	30	26	15	4	214.30
9	Literary	30	30	5	4	350.13
	Non-Literary	30	29	19	8	279.70
11	Literary	30	26	6	4	343.27
	Non-Literary	30	27	19	6	327.70

2.2 Procedure: Corpus Annotation

Our sample corpus was hand-coded by a team of six annotators using a dependency grammar framework developed specifically for the project.[2] Annotation focused on syntactic features within the noun phrase (NP) and on subordination (SC; the focus of the current article). As Figure 1 illustrates, each text was transferred in its entirety to a spreadsheet, with one word per row. Each word was indexed with a sentence and word number. Annotators were asked to identify: the head of each NP and SC ('status' column); the part of speech of each word within each NP or SC ('pos' column); the word on which each of those constituent words is grammatically dependent ('dep on' column); specific syntactic functions defined within the framework and the status of verbs as finite or non-finite ('dep' column). The head of each NP and SC was annotated to show its role in the broader sentence. Additionally, selected internal dependencies were specified within each NP. Adverbial clauses were defined as finite and non-finite clauses which function adverbially with respect to a surrounding clause (Biber, Johansson, Leech, Conrad, Finegan, 1999). These include standard adverbials, sentence adverbials, comment clauses and tag clauses, but not prepositional phrases functioning as adverbials.

Each text was annotated independently by two annotators. Inter-rater agreement was high (status column: 96%; pos column: 94%; dep column: 89%; dep on column: 92%). Where annotators disagreed, the code was adjudicated by the second author of the present article.

	A	B	C	D	E	F	G
1	sentence number	word number	word	status	pos	dep	dep_on
2	1	1	As		conj_sub		4
3	1	2	the		det		3
4	1	3	celebration	np	noun_com	subj	4
5	1	4	came	sc	verb_lex_act	adv_fin_fronte	11
6	1	5	to		prep		4
7	1	6	an		det		7
8	1	7	end	np	noun_com	prepobj	5
9	1	8	,				
10	1	9	the		det		10
11	1	10	guests	np	noun_com	subj	11

Figure 1. Sample of syntactic coding.

2.3 Quantitative Analysis

An R script (R Core Team, 2014) was written to quantify the frequency and mean length (in words) of syntactic features of interest in each coded text. To allow comparison of texts of different lengths, frequencies were normalised to occurrences per main clause[3]. The data points in our analysis are thus individual texts, each of which is associated with a mean SC length and normalized SC frequency.

It is important to acknowledge that these texts are not 'independent' in the statistical sense: some writers contributed more than one text; multiple texts were written in response to the same assignment, and within the same school and/or academic discipline. Such texts are likely to be more closely related to each to than texts produced by different writers, on different topics, and in different schools or disciplines. For this reason, our inferential analyses used mixed-effects models (MEM). This enabled us both to quantify the influence of these grouping variables and to control for lack of independence[4]. We adopted the three-stage stepwise procedure recommended by Gries (2015), which involves:

1. identifying the maximal fixed effects structure and maximal random effects structure of interest. For all analyses, the maximal fixed effects structure comprised the main effects of year group and genre plus their interaction. The maximal random effects structure comprised: schools; disciplines; writers as nested within schools; titles as nested within disciplines. The two nested structures are crossed because individual titles were written by multiple writers, whilst individual writers wrote on multiple titles. Titles also cut across schools as students from multiple schools wrote on common titles, reflecting the influence of a national curriculum with shared public examinations;

2. determining the optimal random effects structure by removing each random effect in turn, and comparing the overall quality of the model when the effect is present versus when it is absent. In each case, particular random effects were retained only if their removal made the model quality significantly worse, as indicated by the Akaike Information Criterion;

3. determining the optimal fixed-effects structure. This involved sequentially removing any fixed effects which were neither significant in themselves nor participated in any higher order interactions. As with the Stage Two procedure, a particular fixed effect was retained only if removing it made the model quality significantly worse.

To ensure that the models met the assumptions of MEM (Tabachnick & Fidell, 2014; Zuur, Ieno, Saveliev, & Smith, 2009), histograms of residuals were checked to identify significant outliers; residuals vs. observed values were checked to confirm the linearity of the data; Q-Q plots were checked to confirm the normal distribution of residuals and random effects; plots of standardized residuals vs. fitted values were checked to confirm homoscedacity of residuals. To correct for non-normally distributed residuals, dependent variables were transformed to their base 10 logarithm[5].

2.4 Functional Analysis

While quantitative analyses can identify patterns of variation in language use, qualitative examination of language in context is required to understand what those patterns mean. To this end, all examples of adverbial clauses in the corpus were retrieved and categorized for functional roles.

Although some taxonomies of adverbial functions exist (e.g, Biber et al., 1999; Quirk, Greenbaum, Leech, & Svartvik, 1985), these are not sufficiently consistent with each other to provide a single set of categories which we could confidently apply. Moreover, in dealing with children's developing usage, it is important to allow for categories which do not align with those defined for adult language. We therefore determined categories through an inductive iterative process. The first author of this article read through all 1,540 examples and categorized each with an initial code which described his understanding of that example's function in the text. He then created a coding document which defined each code and provided representative examples of each. The third author then used this document to independently code a sub-sample of examples. The two authors subsequently met to discuss their codes and negotiated any disagreements. Based on this discussion, unclear definitions were rewritten and, where necessary, categories were deleted, added or combined. Codes assigned to the sample were also revised retrospectively. The two authors then independently used the revised coding document to code a further subsample of texts, followed by a further round of

negotiation and further adjustment of the coding document. This continued in an iterative way across three rounds, such that all examples had been coded by both coders and we arrived at a set of codes which achieved a balance of descriptive adequacy and rater consistency. The final set of codes is shown with examples in Appendix A.

3.   Findings

3.1   Overall Frequency of Subordinate Clause Types

An initial analysis of subordinate clauses in the corpus showed adverbial clauses to be the most commonly-used type of subordination, with an average of .36 occurrences per main clause (see Figure 2). Finite adverbials are the most frequent subtype, with .25 occurrences per main clause, while non-finites appear, on average, .11 times per main clause. This suggests that adverbials are a key form of subordination in children's writing and so an important focus for study.
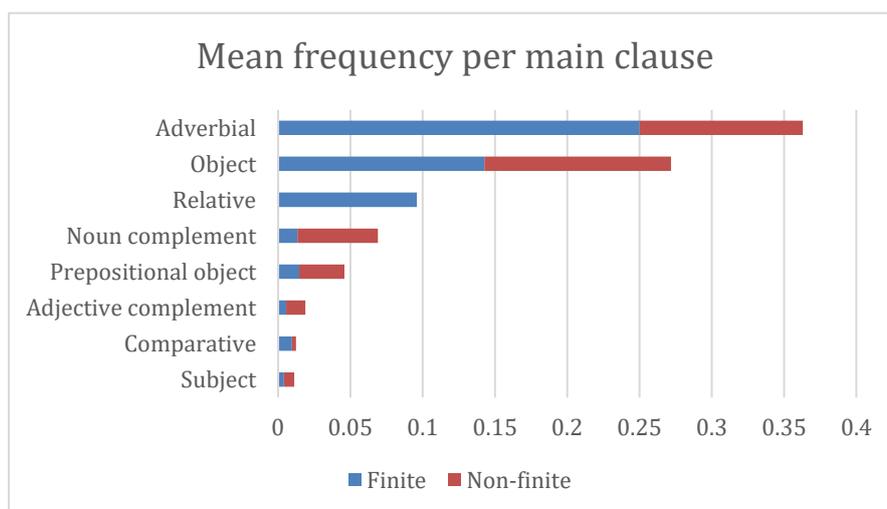

Figure 2. Frequencies of subordinate clause types.

3.2   Frequency of Adverbial Clauses Across Year Groups and Genres

The mean frequency of adverbial clauses across year groups and text genres is shown for finite and non-finite clauses in Figures 3a and 3b, respectively. The best-fitting MEMs for each clause type are shown in Tables 3a and 3b. Both types of adverbial were used significantly more frequently by older children. Figures 3a and 3b suggest that, while the age-related increase in use of non-finite adverbials is linear, for finite adverbials, levels of use level-out from Year 6 onwards, with

infrequent use of finite adverbials being restricted to Year 2 students. Figure 3a also suggests a genre effect: that is, non-literary writing used finite adverbial clauses more than literary writing and the increase in use across age groups was restricted to this genre, with literary writing remaining constant. While a regression analysis confirmed both of these effects, they did not turn out to be significant in the MEM, which included task as a random variable. Thus, the apparent genre effects could not be reliably separated in these data from the effects of individual writing tasks.

Table 3a. Mixed-effects model for log10 frequency of finite adverbial clauses

Fixed effects	Value	SE	df	t-value	p-value
Intercept	-3.14	.29	66.41	-10.68	<.0001
Year group	.24	.04	71.57	6.43	<.0001
Random effects					
	Variance	Std. Dev			
Title within discipline	.49	.70			
Residual	1.79	1.34			
Goodness of fit					
R^2 marginal	.23				
R^2 conditional	.39				

Table 3b. Mixed-effects model for log10 frequency of non-finite adverbial clauses

Fixed effects	Value	SE	df	t-value	p-value
Intercept	-4.32	.28	31.94	-15.21	<.0001
Year group	.30	.04	35.27	8.42	<.0001
Random effects					
	Variance	Std. Dev			
Title within discipline	.27	.52			
Residual	2.34	1.53			
Goodness of fit					
R^2 marginal	.29				
R^2 conditional	.36				

3a: Finite adverbial clauses   **3b: Non-finite adverbial clauses**
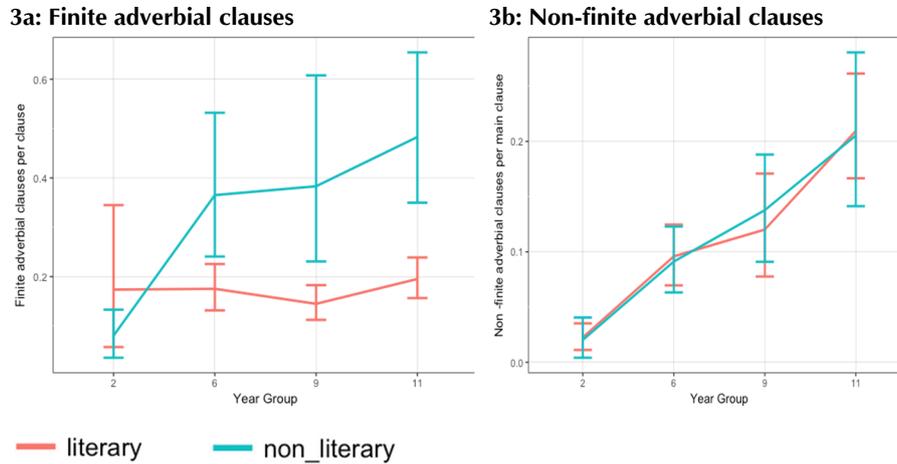

Figure 3. Mean frequency of adverbial clauses across year groups and text genres.

To understand the reasons for these quantitative shifts in use of adverbials, all cases of these clauses were retrieved from the corpus and categorised functionally, as described in Section 3. Figure 4 shows how the use of each functional category was distributed across text genres. By far the most common types were *reason* and *co-occurrence*.
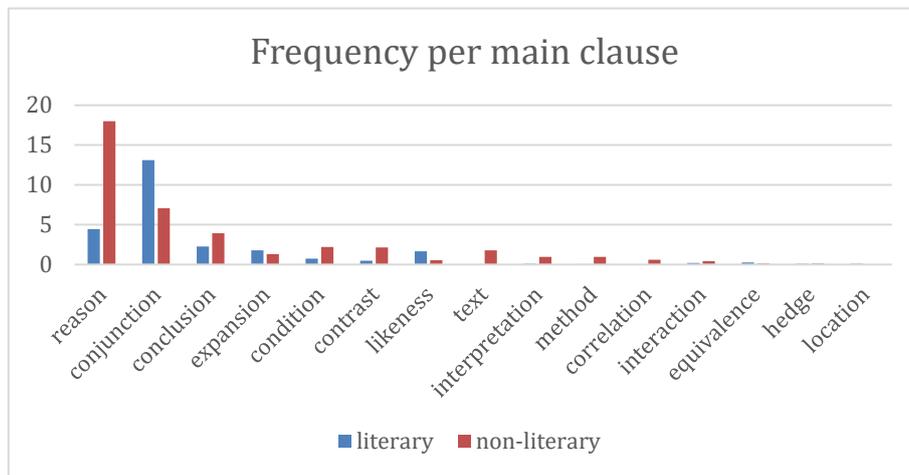

Figure 4. Distribution of adverbial functions across genres

The former refers to cases where the adverbial provides a reason, aim or support for a situation or judgment. The latter is primarily used to provide more detail about

a scene, to set events in a temporal relationship with each other, or to describe a context within which an event occurs or against which it should be interpreted.

As well as being the most frequent categories overall, these uses of adverbials show clear genre preferences: reasons are mostly found in non-literary texts, whereas co-occurrences are mostly found in literary texts. Less frequent categories also appear to show biases towards particular genres, though their relatively small numbers mean that we can be less confident about the reliability of these patterns.

Figures 5a and b show how the frequencies of functional categories are distributed across year groups for literary and non-literary texts, respectively. Year 2 students used adverbials for a much narrower range of functions than older children. In literary texts, Year 2 students used adverbials for five different functions, compared with eight functions for Year 6, 12 for Year 9, and 13 for Year 11. In non-literary texts, Year 2 students used adverbials for three functions, compared to 12 for Year 6, 13 for Year 9, and 10 for Year 11. Second, the use of adverbials by Year 2 children is not in line with the genre-norms seen in Figure 4: co-occurrence and reason adverbials are used with equal frequency in literary texts, whereas in the corpus as a whole the former is much more frequent. The categories of contrast and correlation, which are usually found in non-literary texts, were used by Year 2 writers only in literary texts, suggesting that there may be less understanding of genre distinctions at this stage of development.
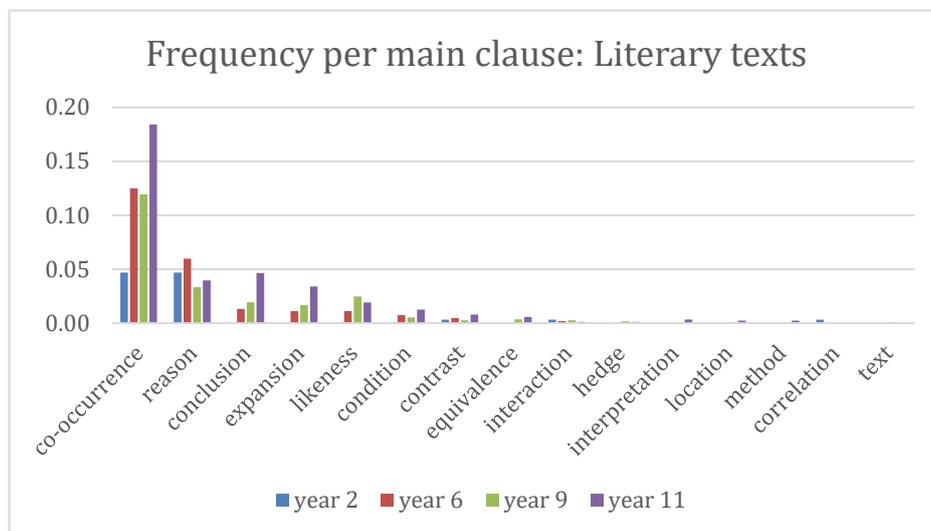

Figure 5a. Distribution of adverbial functions across years in literary texts.
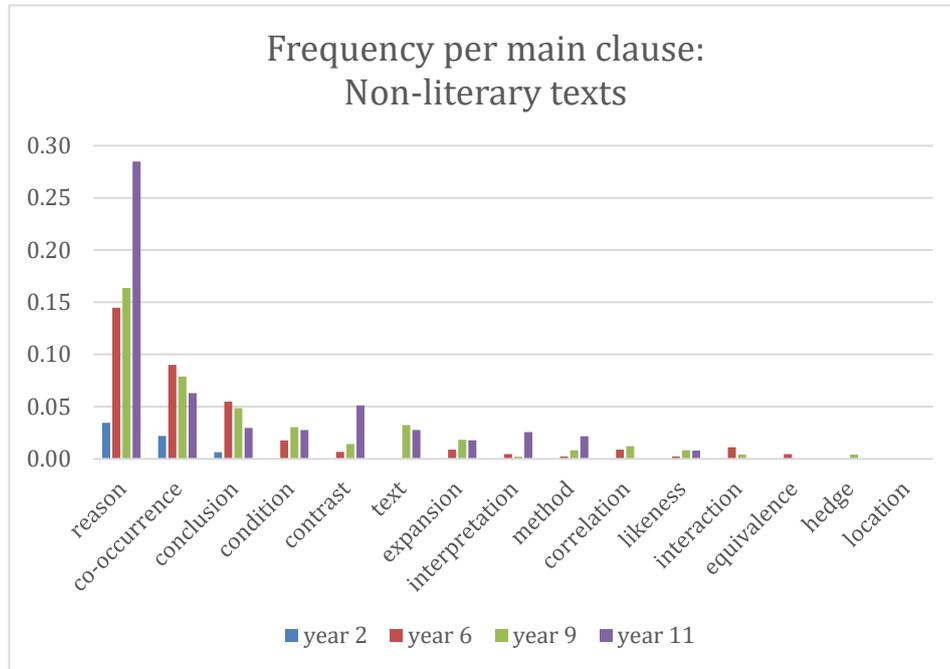
Figure 5b. Distribution of adverbial functions across years in non-literary texts.

Looking in particular at the two most frequent functions, use of co-occurrence adverbials in literary texts is relatively infrequent for Year 2 learners. Year 6 shows a sharp increase, which then levels-off at Year 9 before rising again sharply at Year 11. In non-literary texts, use of co-occurrence adverbials tends to decrease across year groups from Year 6 onwards.

Use of reason adverbials in literary texts starts off relatively high in Years 2 and 6. It then drops away at Year 9 and 11. In contrast, their use in non-literary texts shows an increase from each year group to the next, with Year 11 especially showing a large increase.

In an attempt to understand this striking jump in the use of reason clauses in non-literary writing, we investigated their frequencies at a more fine-grained level of analysis, separating use in texts written for English vs. Science classes. While the use of these clauses in English discipline writing remained almost constant from Year 9 (*M*=.19, *SD*=.13) to Year 11 (*M*=.20, *SD*=.15), their frequency in science writing more than doubled. For Year 9 writers, around one in five clauses (*M*=.18, *SD*=.27) was an adverbial reason clause, whereas for Year 11 writers, this rose to one in two clauses (*M*=.51, *SD*=.30).

This dramatic increase reflects a clear shift in the questions that are being set at Year 11 level, as students prepare for their GCSE[6] examinations. At Year 9, the science writing tasks in our corpus are largely responses to questions phrased using prompts such as how, discuss, describe or are reports of experiments. Of nine distinct tasks represented in the corpus, only one includes the word *why* as part of its prompt. In contrast, Year 11 tasks almost invariably include a specific request for reasons (see Figure 6).

"Biomass" Question
Look at the graphs.
They show how the biomass of phytoplankton and zooplankton changes over a year in two place, the Arctic and the North Atlantic oceans.
Describe the similarities and differences between Graph A and Graph B **and suggest reasons** for these differences.

"Food Chain Energy" Question
Look at the energy flow through the food chain.
Calculate the efficiency of energy transfer from the plants to the sheep.
Explain how energy is lost from this food chain, and **why** this limits the length of the food chain.

(titles and emphases added)

Figure 6. Example tasks in Year 11 Science writing

Of eight distinct tasks in the corpus, five include a specific prompt for reasons. Strikingly, this intensive training in giving reasons also appears to carry over to tasks where no such request is made, as in examples 1 and 2:

> 1.
> Q1. Do your results support the hypothesis you investigated? You should use any pattern you can see in your results to support your answer. You should include any examples from your results.
> A: I think that the results I got do support the hypothesis I investigated **because after a fixed period of time the temperature of the water did drop, and I did use a variety of different temperatures which include 80°C, 70°C, 60°C, 50°C and 40°C.**

2.

Q2b) **-** Look at Case Study 2. The students recorded the mean values of the temperature after 5 minutes. What mistakes have the students made in recording the mean values? Explain what the students should have done.

 A. The mistake that the students made in recording the mean values is that they haven't put a specific decimal place in place **because in one there's one decimal place and in another there's 5 decimal places.** This will make the results very hard to compare if they are like this. I also think that the students who did the chart have made a mistake **because they haven't checked for anomalies in their which which cannot be included into the mean.**

3.3 Length of Adverbial Clauses Across Year Groups and Genres

The mean length of adverbial clauses across year groups and text genres is shown for finite and non-finite clauses in Figures 7a and 7b, respectively. The best fitting statistical models are shown in Tables 4a and 4b. In the case of finite clauses, no random effects made a significant contribution in mixed effects modelling so a multiple regression model was fitted.
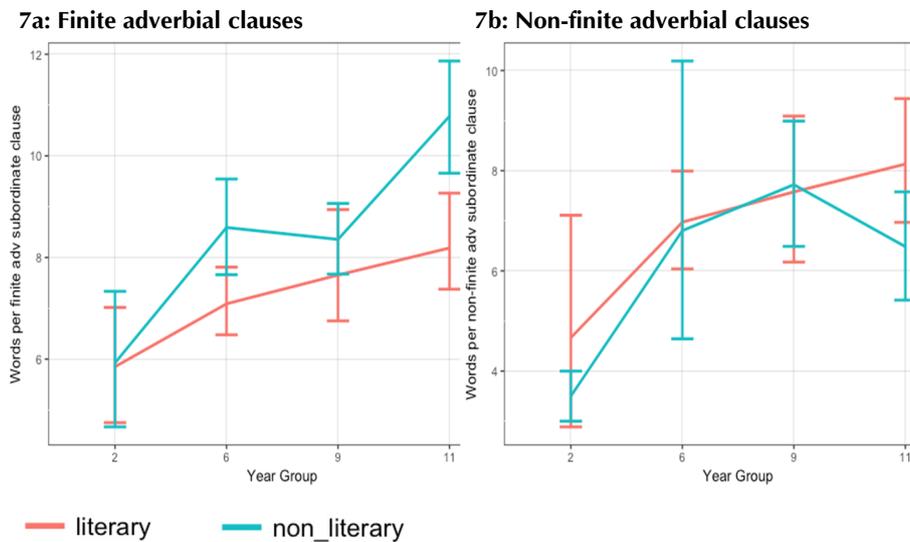
7a: Finite adverbial clauses   **7b: Non-finite adverbial clauses**

Figure 7. Mean length in words of adverbial clauses across year groups and text genres.

Table 4a. Regression model for log10 length in words of finite adverbial clauses

Fixed effects	Value	SE	df	t-value	p-value
Intercept	.774	.024	190	31.73	<.0001
Year group	.017	.003	190	6.14	<.0001
Genre	.067	.017	190	4.06	<.0001
Goodness of fit					
Adjusted R^2	.22				

Table 4b. Mixed-effects model for log10 length in words of non-finite adverbial clauses

Fixed effects	Value	SE	df	t-value	p-value
Intercept	.648	.082	1.97	7.91	<.05
Year group	.022	.005	139.30	4.16	<.0001
Random effects					
	Variance	Std. Dev			
Writer within school	.018	.137			
Title within discipline	.009	.094			
Residual	.011	.104			
Goodness of fit					
R^2 marginal	.08				
R^2 conditional	.74				

Both types of adverbial clause show a significant increase in length across year groups. While the increase for finite clauses is more-or-less linear, non-finite clauses show a levelling-off after Year 6, especially in non-literary writing. For finite clauses, there was also a significant effect of genre, with non-literary texts using significantly longer clauses than literary texts. The differences in length between years is large: whereas Year 2 finite adverbials were, on average, 5.9 words in length for both genres, Year 11 finite adverbials were 8.2 words for literary and almost 10.8 words for non-literary texts. For non-finite adverbials, Year 2 mean length was 4.7 in literary and 3.5 in non-literary texts, whereas Year 11 mean length was 8.1 for literary and 6.5 for non-literary texts.

Figure 8 throws more light on the differences between groups by showing the full spread of lengths found for each clause type. Strikingly, the mode value does not change much between year groups. For finite clauses, all year*genre groups have a mode of 5 or 6 words, with the exception of Year 2 non-literary, which has a mode of 4. For non-finite clauses, all year*genre groups have a mode of 3 or 4 words, with the exception of Year 6 non-literary, which has a mode of 5. In other words, the most frequently used clause length remains essentially the same across genres

and year groups. Table 5 shows illustrative mode-length adverbial clauses for texts from Years 2 and 11.

What does differ is the proportion of very long clauses. Whereas only 5% of Year 2 finite adverbials are longer than 10 words, this figure rises to 17% for Year 6, 19% for Year 9 and 36% for Year 11. For non-finite clauses, 8% of Year 2 adverbials are longer than 8 words, compared to 28% at Year 6, 32% at Year 9 and 30% at Year 11. Similarly, it is the use of longer clauses which distinguishes genre in finite clauses: while only 9% of Year 11 literary clauses are longer than 10 words, the figure rises to 27% for non-literary texts.

Table 6 gives us some clues as to the functional patterns of use that underlie these results. Starting with finite clauses, we can see that the majority (70%) of long (i.e. >10 words) clauses in literary texts express either co-occurrence or likeness. For non-literary texts, reason clauses account for over 70% of long clauses. This figure is much higher than the overall prevalence of finite reason clauses in non-literary texts (54%), showing that such clauses tend to be clustered towards the long end of the spectrum. We have already seen that Year 11 texts show an unusual prevalence of reason clauses in their non-literary writing, so it may be this prevalence which drives the greater length of their clauses. The lack of such clauses in literary texts may also be a key reason for the length difference between the two genres seen for finite clauses. For non-finite clauses, three functions dominate amongst longer clauses: co-occurrence, expansion and conclusion together account for 91% of such clauses. For non-literary texts, reason, method and conclusion clauses together account for 83% of long clauses. Method and conclusion clauses in particular are more prominent amongst long clauses than amongst clauses in general, implying that clauses of this type tend to be long.

8a: Finite adverbial clauses
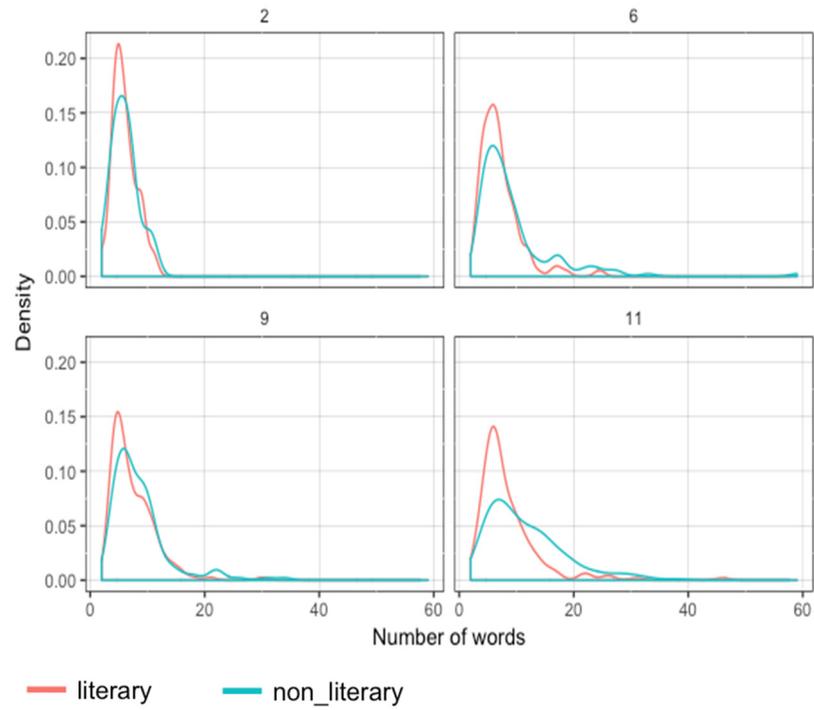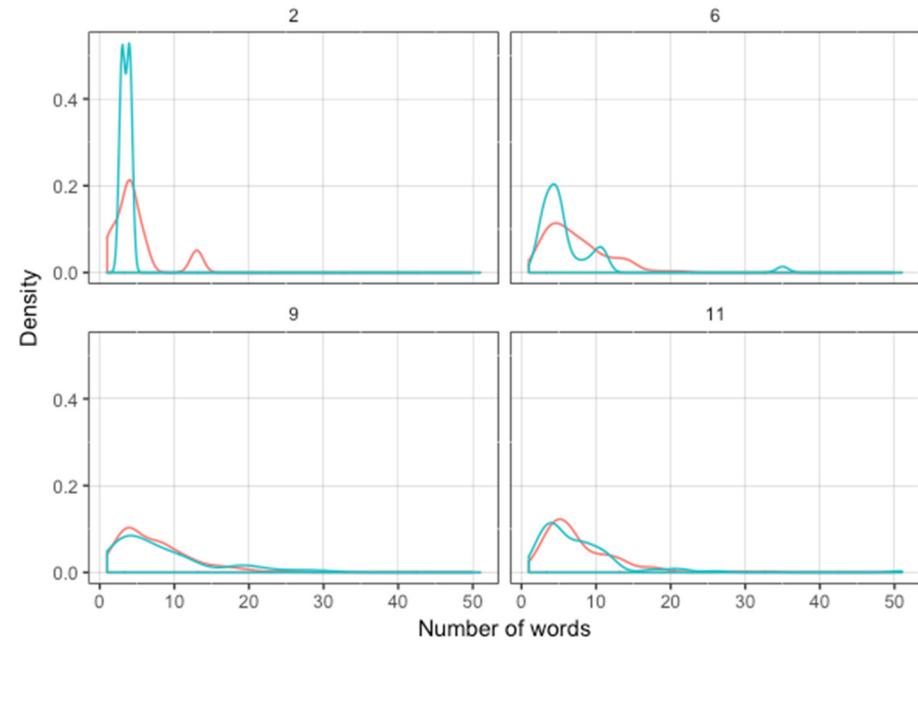
8b: Non-finite adverbial clauses

Figure 8. Spread of mean adverbials lengths across year groups and text genres.

Table 5. Mode-length adverbial clauses

Genre	Clause type	Year 2	Year 11
Literary	Finite	**When the meerkats were sleeping** a snake slithered into the burrow.	It was a quick moment of relief and comfort, **before the doors imprisoned us again.**
	Non-finite	But a fennec was coming **to take two pups.**	Clouds lay a blanket of misery, **trapping the malicious storm.**
Non-literary	Finite	**When we got there** I saw a ferocious tiger.	**Once I have done this** I will start the stopwatch for exactly 10 minutes.
	Non-finite	**Being a teacher** we could ask Personname to come to Institutionname and teach together and be friends.	This likely to use more energy **to obtain the food** than you gain out eating it.

Table 6. Functions of long clauses in Year 11 texts

Clause type	Literary texts			Non-literary texts		
	function	% of all clauses	% of clauses > 10 words	function	% of all clauses	% of clauses > 10 words
Finite clause	co-occurrence	61.69%	57.58%	reason	54.21%	70.41%
	likeness	10.39%	12.12%	contrast	13.16%	14.29%
	conclusion	3.90%	9.09%	interpretation	4.21%	7.14%
	reason	7.14%	9.09%	conclusion	2.63%	3.06%
	expansion	1.30%	6.06%	text co-occurrence	4.74%	3.06%
	contrast	4.55%	3.03%	co-occurrence	11.05%	1.02%
	interaction	0.65%	3.03%	expansion	1.05%	1.02%
Non-finite clause	co-occurrence	41.46%	48.57%	reason	45.16%	33.33%
	expansion	17.07%	22.86%	method	11.83%	27.78%
	conclusion	21.34%	20.00%	conclusion	10.75%	22.22%
	reason	14.63%	5.71%	interpretation	5.38%	11.11%
	likeness	0.61%	2.86%	co-occurrence	11.83%	5.56%

An examination of the most prominent long-clause functions in Year 11 texts provides more qualitative insight into these patterns. As we have seen, co-occurrence clauses make up the bulk of long adverbials in literary writing. The majority of these are placed after the main clause and serve to add richness of detail to a scene or to complete an idea, as in examples 3-4:

> 3. *Regret fills me with a solemn dread* **as I sit in the house watching the scene unfold out my transparent window.**
>
> 4. *Every so often the traffic up there slowed to a crawl and if he tried hard enough, he could even hear the yells of the impatient drivers* **as they hurried home to their families in the town across the bay that was currently so hidden by a thick fog that only the lights of the waterfront were visible**

Of the 20 long finite clauses in our corpus, 18 were of this type. A similar but much weaker preference was seen for non-finite clauses (11/17). Less common (especially amongst finite clauses) were cases like example 5, where the adverbial is fronted to set a context for the main clause. Fronted adverbials of this sort are most commonly non-finite.

> 5. **Fed by the water darting down from the colourless sky and the wind which shipped at the landscape,** *it continued its rampage - its path of destruction.*

For non-literary texts, the most common function by far is *reason*. In science texts, long finite clauses of this type were mostly used to justify a claim made in the matrix clause, as in example 6, whereas in English texts, they most often explained a cause-effect relationship detected in a text being discussed, as in example 7:

> 6. *This is worse than aspirin* **because the platelets mainly stop platelets gathering together in the blood and may not have such a detrimental impact at an open wound.**
>
> 7. *This could show how Lady Macbeth feels guilty* **because she can't face what she has done so she hides the truth from herself so she won't be reminded of what she has done**

Non-finite clauses of this type (which were far less common) were more concerned with purposes, as in example 8:

> 8. He then uses tautology in `"fullgrown thickness" **to emphasise how filled with green and life the trees are**.

Both long co-occurrence clauses in literary works and long reason clauses in non-literary works also showed some regularities of formal structure that are worth noting. 18/20 long finite co-occurrence clauses in literary texts are headed by the subordinator *as.* Long finite reason clauses in non-literary texts invariably took either *because* or *as* as their subordinator. In writing for English classes, there was

an even split between the two (14 cases of each), whereas writing for science classes preferred *because* (27 cases, compared with 13 for *as*).

Long non-finite co-occurrence clauses in literary writing frequently (10/17) incorporated multiple non-finite verbs. A common strategy is to place non-finite clauses in parallel, as in example 9:

> 9. ***Guarded by trees, surrounding the village in dense forests, extending as far as the eye can see,*** *its sole connection is a single road.*

> Long non-finite reason clauses in non-literary clauses were invariably *to-infinitive* clauses, of the sort shown in example 10:

> 10. I believe that Priestley uses the younger generation **to prove to the audience that society needs to be changed for the better**

4. Discussion and Conclusions

4.1 Summary of Findings

This study set out to understand how children's written language changes as they progress through school in England, looking specifically at their use of adverbial subordinate clauses. Adverbials - particularly finite adverbials - were found to be by far the most common form of subordination. This confirms findings from previous research (e.g., Harpin, 1976) and lends weight to our assumption that they are likely to be a feature of key developmental interest. Children were found to make greater use of adverbial clauses as they progressed through school. For finite clauses, there is a marked jump during the primary years (Years 2 to 6), which levels off thereafter. This matches the pattern for adverbial clauses as a whole suggested by our synthesis of previous literature (Harpin, 1976; Nippold et al., 2005; Noyce & Christie, 1985; Sampson, 2003). Previous research suggests that further increase should not be expected thereafter; children at the end of primary education appear to have reached adult-like levels of use (Nippold et al., 2005; Sampson, 2003). Non-finite adverbials, which had not been an explicit focus of previous research, showed a more linear development over time. Both types of adverbial clause also increased significantly in mean length across year groups. While the most frequently-seen length remained fairly constant (5-6 words for finite clauses; 3-4 words for non-finite clauses), older children showed an increased use of very long (e.g. > 10 words) clauses. For non-finite clauses, the increase was somewhat truncated, with little development after Year 6 and mean lengths not exceeding around eight words. Finite clauses, in contrast, saw a linear increase, with mean length in Year 11 non-literary texts approaching 11 words. The latter form, it seems, allows for more open-ended flexibility with regard to extension. Non-literary writing especially offered scope for lengthy finite clauses.

In the functional analysis, the youngest writers were found to use adverbial clauses for a narrow range of rhetorical purposes, mirroring the findings of Christie

and Derewianka's (2008) analysis of Australian children's writing. By the end of primary school, this range widens sharply and continues to grow throughout secondary education. By far the most common functions were those which we have called *co-occurrence* and *reason*. The former is primarily associated with literary and the latter with non-literary writing. Use of co-occurrence clauses in literary writing shows a sharp increase between Years 2 and 6 and again between Years 9 and 11. The frequency of reason clauses in non-literary writing shows an increase from each year group to the next but is particularly marked by a sharp rise at Year 11. We saw that this is the product of intensive use of these clauses in science writing, where, on average, every second clause is a reason adverbial. This increase reflects a shift in the types of question which are set at Year 11, where explicit demands for reasons become far more prominent than in earlier years. Indeed, reasons become so routine a part of expectations that students start to provide them even when not explicitly required.

The functions of co-occurrence and reason are also primarily responsible for the increased length of finite clauses. In literary texts, long finite clauses are mostly co-occurrence clauses, usually *as*-clauses placed after the main clause to add detail to a scene or complete an idea. In non-literary texts, long finite clauses are overwhelmingly reason clauses starting with because or as. In science texts, these are mostly used to justify a claim made in the main clause. In English texts, they explain cause-effect relationships occurring in a text which is under discussion. Non-finite clauses, as we have discussed above, show less scope for development in terms of length. They also do not seem to be driven by any one function. In literary writing, long non-finite clauses tend to be co-occurrence, expansion or conclusion clauses. A particular strategy for lengthening these is the use of multiple clauses in parallel. In non-literary texts, long non-finite clauses primarily express reason, method, or conclusion.

4.2 Implications for a Model of Writing Development

In terms of our understandings of writing development, the research described above offers a number of substantive conclusions. First, it highlights the importance of pitching linguistic analyses at an appropriate level of granularity. Our literature review showed how previous research has tended to prefer the broadly focused, linguistic category of subordination, over more fine-grained analysis. We saw that there has been little work on specific types of subordination and none contrasting finite versus non-finite adverbials. However, our results have shown that there are large differences in the extent to which different types of subordination are used in children's writing and that finite and non-finite adverbial clauses follow contrasting developmental courses. This implies that coarse-grained measures based on counts of subordination obscure important developmental patterns, hence calling into question their value as a means of understanding development.

Second, our data showed that finite adverbial clauses are an early-developing form in the sense that children use it with mature frequency by the end of their primary education, whereas use of non-finite clauses increases throughout secondary school. This contrast does not appear to be a feature of finite versuus non-finite clauses in general. Figure 2 showed that for many types of subordination (noun complements; prepositional objects; adjective complements, subjects), the non-finite is the more frequent form in child writing and our informal analyses of the development of non-adverbial clauses across year groups (not reported here) does not show finite clauses to be faster developing than non-finite clauses in general.

One plausible explanation for the contrast is that finite forms are picked up earlier because they are more frequent in the language as a whole. Biber et al. (1999, pp. 768-769) find finite adverbial clauses to be about twice as frequent as non-finite clauses in adult use. Usage-based models of language learning (Kemmer & Barlow, 2000) would therefore predict that they would be mastered earlier. An important caveat must be attached to this suggestion, however. As we discussed in Section 1, the complexity of the writing process implies that we cannot be confident in ascribing differences in language use directly to differences in underlying lexico-grammatical knowledge. An equally plausible possibility is that use of non-finite clauses increases in later years because the types of writing that older children are asked to do make greater call for this form. In particular, we have seen that non-finite adverbials are used to supply reasons, aims or support for a situation or judgment. It may be that this is something that older children (especially those in Year 11, where the largest increase is seen) are particular asked to do, whereas expressing co-occurrence (the most common function of finite clauses) is needed from younger ages.

Data of the sort presented present no way of definitively unpacking these possibilities. However, it is probably best not to see them as mutually exclusive explanations. It is likely that young children are most comfortable with finite adverbials because they have encountered them frequently and that their education compounds this by calling on them to make extensive use of the form. As their exposure to sophisticated reading texts increases, they are likely to gain confidence with non-finite forms and this confidence is further bound up with the types of writing which they are then asked to do. Learning to write is, in the final analysis, about gaining parallel mastery over particular text types and the linguistic forms that are associated with those types and there is probably little to be gained by attempting to pull these factors apart.

It is also worth noting that the function-dependent nature of children's writing development further highlights the fact that it makes little sense to talk of a single context-independent course of development. The fact that generic measures of subordination do appear to show such context-independent patterns further

highlights their unsuitability for the purpose of constructing a developmental model.

This is also emphasized by the divergent findings found for clause length. These have demonstrated that finite vs. non-finite adverbials offer different possibilities for the development of internal complexity. Moreover, the fact that mode lengths tended to remain relatively constant and that increased mean lengths were the result of a thin tail of very long clauses implies that studies based on mean clause length may be providing a misleading impression. Writing development does not involve use of longer subordinate clauses in general. Rather, it involves an increased facility to apply a small number of long forms when they are needed.

We have also seen that use of long clauses is quite formulaic. Children, it seems, learn to use specific forms of the structures for specific purposes. Thus, this increased complexity is, at least at age 16, tightly constrained. As with the findings for finite vs. non-finite clause frequency, this pattern is in accordance with usage-based models of learning, whereby complex forms are initially mastered by gaining control over a narrow range of formulaic exemplars (Kemmer & Barlow, 2000). An interesting focus for future research would be to investigate the extent to which children further follow the predictions of such models by developing a more flexible range of long clauses as their writing matures.

Finally, this extensive use of particular forms raises the question of the role that *strategic overuse* might play in development. That is, it may be that children's learning is facilitated by using particular forms more frequently than would be normal for a particular genre. This is seen most clearly in the explosion of reason clauses in Year 11 science writing, where more than half of clauses are subordinate adverbials of reason. Intensive use of *why* questions at this level appears to lead students to produce this form so instinctively that it becomes a format for all of their answers, regardless of whether the particular question at hand calls for it or not. It is plausible that such strategic overuse is a necessary phase of learning through which children pass as they practice flexing their linguistic muscles in getting to grips with the norms of a particular genre.

4.3 Pedagogical Implications

Though the ultimate aim of our research is to inform educators, pedagogical implications cannot be directly read off from our results. An understanding of how language develops within the constraints of a particular educational system needs to take its place within a much wider picture of educational research, teachers' professional wisdom, and societal value judgments about worthwhile educational ends. However, our findings do suggest a number of conclusions which can feed usefully into this picture.

First, adverbial clauses are the central example of subordination in children's writing, in the sense that they are more common than other forms. This suggests

that they may be a good focus for teachers wishing to help children understand subordination as a grammatical category. This is implicitly acknowledged in the National Curriculum (see Table 1), which introduces subordinate clauses at Year 2 in terms of clauses using when, because and that, the first two of which are clearly adverbials clauses. While Years 3 and 4 do not explicitly mention subordination, they do focus on adverbials of various kinds. From a teacher education perspective, it may be useful for teachers to notice that these can be clausal, to understand the overall category that covers these structures across Years 2-4, and to appreciate its overall importance in student writing.

Second, our research has shown the importance of the range of functions to which clauses are typically put and the ways that these can vary across genres. Indeed, we have argued above that it may be changes in this repertoire of functions, rather than changes in underlying linguistic knowledge per se, that drives development in the use of adverbial subordination. Young children use adverbial clauses for a very narrow range of functions and this range (unlike the overall frequencies of clauses) continues to develop throughout their educational careers. They also appear to learn to associate particular uses (and hence particular forms) with particular genres.

The National Curriculum offers little guidance on the functions of subordinate clauses and still less on genres. What it does specify is that children in Years 10 and 11 should be taught to write "selecting and using judiciously, vocabulary, grammar, form and structural and organisation features, including rhetorical devices, to reflect audience, purpose and context" (Department for Education, 2014). While this recognition of the importance of the relationship between language choices and audience/purpose/context (i.e. genre) is welcome, the recommendation is vague, with no guidance on how children might be expected to achieve genre-appropriate language choices. It is hoped that data of the sort presented above – that is functional taxonomies of the use of key linguistic forms, information on their distribution across genres, and on their emergence in difference types of student writing - could serve a useful function within teacher education by helping teachers to put more meat on the bones of such recommendations.

Notes
1. For full details of the corpus and information about access, please see http://socialsciences.exeter.ac.uk/education/research/centres/writing/projects/growthingrammar/corpus/.
2. A full description of the framework can be downloaded from http://socialsciences.exeter.ac.uk/media/universityofexeter/collegeofsocialsciencesandinternationalstudies/education/research/centres/writing/growthingrammar/annotation_manual.pdf.

3. Main clauses were identified by the presence of a main verb, with or without an explicit subject. Co-ordinated clauses such as *They came and ate* were therefore counted as two clauses.
4. All models were implemented using R version 3.2 and the lmerTEST R package (Kuznetsova, Brockhoff, & Christensen, 2017), with goodness of fit statistics calculated using the MuMIn package (Barton, 2018).
5. Because some texts had a value of 0, the actual transformation was the log of the original value plus .00001
6. General Certificate of Secondary Education, a set of discipline-specific examinations taken at the end of Year 11.

Acknowledgements

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Appendix A: Functional categories of adverbial clause use

Function	Gloss	Examples
co-occurrence	subordinate clause describes an event or situation which co-occurs with the event in the matrix clause in order to: • describe a context within which the matrix clause is to be interpreted • describe a situation within which the event in the main clause occurs • set events in temporal relation to each other • provide more detail about the main clause	**Being the conceited man he was** took no remorse, grasping at her cheeks, feeling more confident then he did before. It is formed **when the sodium alginate makes contact with the stomach acid**. In the same way that trees can't go back to when they were green **after they die**. She waves goodbye to the lone light **half wishing she had more time**.
conclusion	subordinate clause states an implication or a consequence of the matrix clause. The matrix clause may provide *evidence* for a claim made in the subordinate clause and/or describe a *cause* of the situation/event described in the matrix clause	The bulb would be dimmer with a longer wire and brighter with a shorter wire **making my prediction correct**. He states that trees have a way of hiding this to ordinary people **so that they look like they are immortal**. Next, Batman punched the Joker, **causing him to stumble**.
condition	subordinate clause describes a hypothetical situation in which the matrix clause would apply	This will make the results very hard to compare **if they are like this.** As magnificent as it is, **if not treated properly** it can be as unforgiving and deceitful as the devil.
contrast	either: 1) information provided in the matrix clause is construed as surprising or incongruent, given the information in the subordinate clause OR 2) situation described in the matrix clause is markedly different from that described in the subordinate clause	I immediately knew who he was, **although I had never seen him**: I had only heard descriptions about him when my father spoke about him to my mother. This shows she would prefer to be dead than **to be in the situation she is in.**

Function	Gloss	Examples
correlation	the event expressed in the subordinate clause is proportional to that in the matrix clause	**The higher a ball is held**, the more GPE it gains. The light intensity starts at a medium intensity, and increases **going the west**.
equivalence	states that an entity mentioned in the subordinate clause is in the same situation as that mentioned in the matrix clause	When one goes to this city, they can see a ghost of something which clearly was beautiful, **as is much of the rest of the country**, but has clearly been tainted by the interference of people. I started **as I always do** in the hospital.
expansion	subordinate clause provides further explanation or descriptive detail related to the main clause	They have been testing a disease well "cure" **as they like to call it**. These pupils sat at each desk, **arranged by last-name facing the great blackboard at the head of the cavern**.
hedge	subordinate clause comments on the epistemological status of the matrix clause	**Now that I think about it**, I think they might have survived. The echoes went on and on **it seemed**.
interaction	subordinate clause directly addresses reader or an imaginary character	So **you see Mr** Personname I think that I have enough proof for you to let Institutionname go to Institutionname. "I'm not deaf **you know**!
interpretation	subordinate clause provides an interpretive reading of the matrix clause	The abbreviation of "aren't", gives off a forceful negative and rather pushyfeel **as if the questioning of the older generation has almost given her adrenaline to do more because she knows it 's right**. I stared back right into his soul for as long as I could bare, before my rival broke his, **signalling defeat**.
likeness	expands on the matrix clause by saying that it resembles something expressed in the subordinate clause	The constant air conditioning wherever one goes makes one feel **like they are walking throughout an artificial environment**. I step back **as if to say there is not going to be a murder tonight**.

Function	Gloss	Examples
location	subordinate clause states where the event described in the matrix clause occurred	I started to walk off and **where I was walking** I could see dark shadows appearing in the walls, my heart race was getting faster and I start running faster. **Nearing the boats,** my pulse began to race.
method	subordinate clause describes how the action described in the matrix is achieved	When doing the investigation I will measure the starting temperature, **using a thermometer**. Repeat this experiment **keeping the time to cool of 5 minutes and volume of the water 150 ml the same**, also repeat it in the same room, on the same day to keep the room temperature the same.
reason	subordinate clause provides a reason, aim or support for the situation or judgments stated in matrix clause or vice-versa. In general, it answers the question *why*.	They slapped the water with such force, people jumped out of their seats **thinking it was a clap of thunder**. Furthermore although at first there appears minimal evidence that she is kind, in fact she soothed and consoled her father by reading to him fiction books, **suggested by the quotation "he liked them".**
text deixis	subordinate clause refers to an element within the writer's own text or in a text being studied or signals text organisation	**When we first get a description to Slim** he is also wearing just denim. **As we move through the play and into Act 1 when the Inspector arrives**, the uncover of Eva Smith seemingly takes effect on the younger generation as Eric has the courage to question his father's authority with," why shouldn't they try for higher wages", and" what if they can't move?"