



CAMBRIDGE ASSESSMENT

**‘Aspects of Writing’:
Beyond an atomistic approach to evaluate qualities of features of
writing.**

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A history of the ‘Aspects of Writing’ project.

In 1981 a report on writing and comprehension at different grade levels in English Language was produced by the Test Development and Research Unit (TDRU), part of the University of Cambridge Local Examinations Syndicate (UCLES). A section of this study described the accuracy of punctuation, spelling, grammar, usage and expression, the range of vocabulary, and sentence length. This was extracted from a sample of work comprising candidates’ fourth sentences from the essay question of the 1980 Midland Examining Group¹ English Language GCE² O level.

Sixteen years later, the Evaluation Service section of the Research Division of UCLES used the sentence samples from the 1980 study (which had been preserved as an appendix to the original report) in order to carry out a comparison between performance in English in 1980 with performance at GCSE in 1993 and 1994. The study was reported in 1996 (Massey & Elliott, 1996). Such a study was important because of the nature of the unique data that exam boards hold – evidence of candidate performance carried out under controlled conditions with no access to spell checking or external assistance. The data can be used to provide empirical evidence which then feeds into the ongoing commentary both specifically on standards, but also on education in general. The aim was to look at these features at the different grades awarded in the examination and to investigate how they performed as indicators of performance and progress.

The results of the 1996 study, comparing 1980 with 1993/4 (Massey & Elliott, 1996), showed a fairly dramatic decline in the correct use of most forms of punctuation, and spelling had greatly weakened. Of course it was important to note the changes that had taken place over the course of that decade. The exam papers were very different, and expectations of candidates both in the classroom and in the examination hall had altered. Much of the formality of language seen in the 1980 sample sentences was no longer present, and candidates were writing dialogue and including idiosyncratic phrases much more. The study generated a great deal of media interest in the spring and summer of 1996.

In 2005, the study was updated using examination scripts from June 2004. The results of this were very positive, and were reported in 2005 (Massey et al, 2005). Although there was little evidence of the patterns of very formal language seen in 1980, the counts of correct use of various forms of punctuation were considerably improved on 1994, and there was enormous improvement at the lowest grades. For most of the elements considered, the profile of performance in 2004 was between that seen in 1980 and in 1993 and 1994. One exception was the percentage of words at lexical grade 5 or higher, where grades A and B very considerably outperformed their 1980 counterparts. So 2004 candidates seemed to be using more ambitious vocabulary, and there was also a trend towards a greater use of more sophisticated sentence structures. The report looked at spelling errors, the extent of which were found rather shocking in 1993/1994. At the lower grades the 2004 sample showed considerable improvement on the 1994 sample, and the research team were especially heartened to find only two instances of ‘text’ language amongst the whole sample. At the lowest grades there was a general upsurge in performance in 2004 – in the 1996 study we had to abandon some of the attempts to categorise G grade sentences, because they just didn’t make enough sense to be able to do so, and that problem did not arise in 2004. In 1994 around

¹ Midland Examining Group (MEG) was a group of examining bodies comprising UCLES, the Oxford and Cambridge Board, the Southern Board, the East Midlands Board and the West Midlands Board. It was set up in 1981 and merged with OCR in 1998 (Raban, 2008).

² The examinations from which the study drew samples of writing were (i) the General Certificate of Education Ordinary (O) level, which was the secondary-level academic qualification that examination boards in the United Kingdom conferred upon students from 1951 to 1988 and, (ii) the General Certificate of Secondary Education (GCSE) which replaced it. The GCE O level was graded from A (high) to E (low) and the GCSE from A (high) to G (low) from 1988 to 1994. In 1994 an additional topmost grade - A* - was introduced to the GCSE examination.

a third of the grade G candidates did not succeed in writing a sentence which conveyed any meaning – in 2004 nearly all of them did. The final version of this report was completed at the end of September 2005, and it went on the Cambridge Assessment website (<http://www.cambridgeassessment.org.uk>) at the end of October. The entire report was published as a special issue of the journal 'Research Matters' in November 2005. The work again attracted significant media interest, and was presented at a seminar at the House of Commons and at the United Kingdom Literacy Association and British Educational Research Association conferences during 2006.

Given the longitudinal nature of the study we were able to consider the issue of how standards of performance had changed over time and this aspect of the work was of particular interest in terms of political initiatives and policies.

The atomistic method.

The atomistic approach discards some information about a student's response (style of expression, fluency and originality of ideas etc.) to give a reduced description of student response based on more limited and discrete features. In other words, the features coded are those which can be extracted from a few (or often just one) words. This in turn impacts upon the sampling frame. In the case of the Aspects of Writing Studies in 1996 and 2005, the sampling frame was a single sentence per candidate response. The atomistic method was originally used for the "Aspects of Writing" studies in 1996 and 2005 because the available data from 1980 consisted of single sentences only. Although this restricted the features that could be analysed, the method nevertheless has certain advantages:

- In restricting the features used in the analysis to isolated elements of the writing it is possible to build up a bank of quantifiable features that can be recorded relatively quickly from a large sample of scripts.
- Within the UK system comparability over time is the focus of particular political interest. The comparison on a restricted range of features is intended to be invariant in relation to the task, thus providing a robust comparison over time. The focus of assessments changes over time (in L1 qualifications at 16 the type of task – narrative/comprehension/formal/informal etc), but it is considered that these features we define as atomistic (largely grammar, spelling and punctuation) considered in the Aspects of Writing study will/should always be important.
- With complex features of writing, an analysis either has to be narrative and descriptive or subject to a very strict coding frame. The atomistic features are selected to be largely non-judgemental and should therefore have better inter-rater reliability.

One further important aspect of this sort of comparison is that the inherent simplification within the atomistic method should promote good public understanding of the research.

The atomistic approach cannot provide the depth of knowledge that an ethnographic / qualitative approach might provide. However, it can provide a comparison between two candidate responses on a restricted range of features, where an in depth comparison may simply serve to show that they are different.

The samples and analyses were all stratified by grade. There is a possibility that this approach builds inherent trend structure into the data, i.e. we observe that candidates with lower grades perform poorly on our measures because our measures are similar to the criteria on which grades are awarded, hence we find a trend through circularity. We suggest that this is not the case for the atomistic features as the mark schemes used focus on the content of what is written, with typically only 5% of the marks allocated to grammar or spelling.

Time for change

The Aspects of Writing study has been ongoing intermittently since 1994, with major reports published in 1996 and 2005, based upon writing samples taken from a GCE O level English examination in 1980 and

GCSE English examinations in 1993, 1994 and 2004. The original design of the study was limited by the nature of writing samples collected in 1980. Furthermore, the first study was envisaged as a 'one-off', and the growth of this project has inevitably had an impact upon the fitness of the original method for the purposes to which it may be put in future.

Finally, the considerable amount of media and political interest in this study has thrown up research questions not considered by the original study, and discussion and commentary on the study with and from other experts within the field have revealed both strengths and weaknesses in the methodology of the Aspects of Writing study from 1980-2004.

It therefore became remarkably timely to carry out a review of the design of the Aspects of Writing study, and particularly of the analyses used. A certain number of changes needed to be encompassed in future – most critically the change from the same single teacher judge to a team of trained raters. However, that in itself brought with it the opportunity to expand upon the samples of writing, and to reconsider the analyses chosen. It also allowed the opportunity to improve and extend the design.

Reviewing the method and analyses used by the Aspects of Writing study.

In order to effectively gauge the success or otherwise of different methods of data collection, and to gain an overview of the different features of writing which might be analysed, we began the process of revising the method for future Aspects of Writing studies by reviewing a number of key studies which had taken place in the UK in the decade since the inception of the Aspects of Writing project.

These studies were:

- NFER APU Language Monitoring/Performance Projects 1979-1988 (Gorman et al, 1988)
- Aspects of Writing Study 1 (Massey & Elliott, 1996)
- QCA Technical Accuracy Project, (Myhill, 2001)
- Writing Support Project, (Green, 2001, 2003)
- Changes in KS2 writing, (Green et al, 2003)
- QCA Analysis of Pupil Performance/Implications for Teaching & Learning (QCA, 2004-2006)
- Aspects of Writing Study 2 (Massey, Elliott & Johnson, 2005)

Two different sets of information were sought from the review. These were (i) the **methods used** in the studies, which refers chiefly to the way in which data were gathered – e.g. the nature of the sample of text, whether a coding team was used and (ii) the **analyses undertaken**, which concerns which features of writing were evaluated – for example, counts of correct/incorrect commas and so on.

An initial desk review was undertaken, in which tables of methods used and analyses undertaken were generated for every study, detailing which features of writing were coded, how the coding took place, for example, whether it was a judgement on a rating scale, or a count of instances, and what the outcome was from the analysis.

A meeting was then convened with a number of key researchers in the field³ to discuss the advantages and disadvantages of each coding decision and to discuss the different elements and talk through the different ways of gathering the data.

³ The group comprised Dr Marian Sainsbury, NFER; Professor Debbie Myhill, University of Exeter; Andrew Watts, Cambridge Assessment; Sara Scorey, OCR, and Pauline Sutton and Sylvia Green, Cambridge Assessment.

The outcome of the meeting was a set of tables, detailing the advantages and disadvantages of all the methods used and analyses undertaken, as discussed in the meeting. These were used as the basis for selecting a number of methods and analyses which were piloted on the scripts which had been used in the 2004 study.

Selecting methods, features and analyses for future phases of the Aspects of Writing study

The ultimate selection of the methods and analyses which will be carried forward into future Aspects of Writing studies took place in two stages:

- i. the 2004 scripts from which the single-sentence data reported in 2005 had been collected had been retained. These were used to carry out an initial pilot of the analyses in which we were most interested. A team of six raters were recruited, and twenty five scripts from a range of grades were used for coder training and inter-rater agreement trials.
- ii. Following feedback from coders, and information from the inter-rater agreement statistics, a certain number of analyses were amended, or dropped. The revised coding sheets were then used to carry out further training and inter-rater agreement trials using a fifty script sample from scripts from June 2007.

An issue that has become important with the new method is the need for inter-rater reliability. If we are using several raters we must ensure that they are completing their codings in the same way. Since we had kept all the examination scripts used in the 2004 study, we were able to use these in 2007 to pilot the revised method and new features, using a team of six raters, all of whom were recruited because of their experience in similar studies. Five of the same team of raters then worked upon a sample of scripts from the 2007 sample.

The final selection of method and analyses is shown in Figure 1, with expansion and some commentary about inter-rater reliability (IRR) on the following pages.

100 word analysis

Sentence demarcation

The first group of features that we coded concerned sentence demarcation. These are all quite self-explanatory. In defining stops both question marks and exclamation marks were included with full stops to comprise a set of end-of-sentence stops. Readers familiar with students' writing may not be surprised to learn that other stops (colons and semi-colons) were rarely seen and thus a count of these other stops was maintained, but no analysis undertaken.

- Correct stops, incorrect stops, missing stops. For the Aspects of Writing study this is a new feature as a correct stop always meant the end of a sample in the single-sentence method. The 100-word method allows information on this feature to be gathered.
- Comma splices. Comma splices are a common mistake seen in students' writing where the writer puts a comma between two clauses that should be two separate sentences. These could be categorised as a missing stop, or indeed an incorrect comma. Therefore to avoid double counting a common mistake comma splices were recorded once and not recorded as missing stops or incorrect commas.
- The final feature recorded concerning sentence demarcation was capitalisation. This element was not coded by the raters but will be counted by two members of the research team and differences in counts corrected through an arbitration process.

Inter-rater reliability on these features was good in both the pilot study and the 2007 data (87 to 95%), apart from initial issues with understanding of the coding frame.

These sentence demarcation features are key measures for quantitative analysis, along with being highly understandable. Additionally, they are transparent and thus promote good public understanding of the measure.

Verbs and proper nouns

- Incorrect tense
- Subject-verb agreement
- Correct capitalisation
- Missing capitalisation

There was much discussion about what grammatical features to include for word class. The study could have covered many word classes but many would have been too detailed/specialised for the Aspects of Writing study and are very time consuming to count. In considering which features to include in the study it was necessary to look at what benefits they would bring.

Commas

- Correct use
- Omission
- Incorrect use

These data proved slightly more problematic with inter-rater reliability. The inter-rater reliability in the pilot study caused some concern, with counts of correct and omitted commas achieving only 50% agreement. This had increased significantly following clearer guidance in the main study, achieving 78 to 90% agreement.

This was an important feature of previous aspects studies, and it is, of course, media friendly. It is of particular public interest in the UK in the light of recent bestselling books about this aspect of grammar (Truss, 2003).

Apostrophes

The apostrophe is another important feature with regards to skills of interest to policy makers. There was consistently good inter-rater agreement of above 95% (even in the pilot).

- Possessive apostrophes correctly used
- Possessive apostrophes incorrectly used
- Possessive apostrophes omitted
- Correct abbreviation
- Incorrect abbreviation

The results for punctuation features, as expected, showed good use by higher-graded candidates and poor or absent use at lower grades.

Sentence Structure

In the 2004 study, our teacher-judge classified sentences as simple, compound, complex or multiple. It was also found that using the single sentence method the sentences from candidates below grade E often produced sentences that defied classification.

In the revised method the raters took the sentences within the 100-word sample as they should have been grammatically demarcated, rather than as they were. The fact that an error had been made was already recorded in the sentence structure rating. We also dropped the compound and complex division to give a general feel for the sophistication of the writing. However, instances of coordination and subordination were added to the codings.

- Simple sentences
- Multiple sentences
- Instances of coordination e.g. "I walked out on to the stage and in front of me was a huge crowd of people."
- Instances of subordination e.g. "All these questions were running through my mind as I sat shaking in the waiting room, where every other contestant was sat with their supporters."

Word level features

- Categorising spelling errors
- Linguistic sophistication

In the 1994 and 2005 studies the identification of spelling errors was carried out by two in-house raters who then ensured that their outcomes were the same and jointly revisited any areas of contention to ensure that a correct result was achieved. In the pilot study the inter-rater reliability for spelling errors was disappointingly poor. This may have been due to a number of factors; such as speed of work or the use of highlighter pens to record other counts, which might then have masked spelling errors. Therefore this was moved in-house for the arbitration method as used in the 2004 study.

In the past studies we had a complex method of measuring linguistic complexity using the Hindmarsh Cambridge English Lexicon. However, we were concerned about changes in language (the Lexicon has not been updated since 1980) and had not found a suitable modern replacement. It was also a very time-consuming exercise, involving every word being looked up in the Lexicon. Therefore in the pilot we used rating on a three point scale. The inter-rater reliability was 0.87 and therefore this was retained as a useful measure.

Whole text analysis

Paragraphs

- Number of paragraphs
- Use of paragraphs
- Paragraph links

These include the counts of the number of paragraphs. Within this, the number of coherent and incoherent paragraphs are coded, together with an option for coders to note if a text is heavily dialogue laden. Coders made a judgement about whether paragraphing was appropriately used, absent, overused or underused. Coders indicated whether or not paragraphs followed a logical order, and the effectiveness of links between paragraphs was evaluated on a simple rating scale.

Reader-writer relationship

- How crafted does the piece feel?
- How well-paced does the piece feel?
- Consistency of the narrative perspective

These were rated by the coding team on simple and straightforward scales. In the case of craftedness and pace the rating was of whether it was well crafted/paced or not. For consistency of the narrative perspective, coders decided whether the piece was lacking consistency, partially consistent or very consistent.

Discussion

The Aspects of Writing study has been ongoing for more than a decade, but has begun to outgrow the original method used for the collection of data. The original studies were entirely based upon the data available from 1980, which was a sample of sentences, stratified by grade and candidate gender. The entire text had not been retained so we were limited to the data available from the single sentence. In revising the method, we decided that we would not limit ourselves to the single sentence method, even

though that would mean that for some new features we would not be able to compare back with the earlier data.

We have made some major changes to the method, which we hope will sustain the project in a more robust format for the future. Key amongst these were replacing the single sentence with an 100 word sample, the introduction of counting and analysing the grammatical sentences used by candidates, and introducing whole text features, which broadens the project away from the purely atomistic approach used in the past.

We also made some changes to the features analysed, dropping some of the least successful ratings, replacing a measure of the sophistication of vocabulary based upon the Cambridge English Lexicon with a simpler rating scale, and bringing in the new non-atomistic features such as pace.

Certain things remain very important. The text written by the L1 students must be written under examination conditions and must be in response to a question which requires narrative, extended writing. This has not been without its problems in the UK context, because at GCSE such writing is no longer a compulsory part of the curriculum. However, we have been able to obtain samples from an alternative to coursework paper.

One of the criticisms of the original studies was that they did not take into account the context of the whole piece. This has been brought in to the new methodology as it has been a feature of a number of studies that have been undertaken in the last 10 years. The whole text analyses are not based on atomistic features and could thus be vulnerable to the circularity mentioned before in our measures being similar to the criteria used in the original markscheme.

Although this methodology was carried out in the context of GCSE English and L1 learners it could be useful in other language teaching and learning contexts as a means of investigating grading standards and indicators of progress.

These types of analyses provide information about performance at different grade levels. This is a useful method for considering progression in students' writing and which features of writing develop at different levels of performance. Assessment results can then be used to inform curriculum developers and teachers about which features of writing need greater or less attention.

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Figure 1: The revised list of analyses to be undertaken in future Aspects of Writing studies.

A 100 word sample selected from every script. The script sample will ultimately comprise thirty boys and thirty girls at each grade at GCSE. From this the following information will be coded by the coding team:

Sentence demarcation

- Correct stops, incorrect stops, missing stops.
- Comma splices.
- Capitalisation.

Verbs and proper nouns

- Incorrect tense.
- Subject-verb agreement.
- Correct capitalisation.
- Missing capitalisation.

Commas

- Correct use.
- Omission.
- Incorrect use.

Apostrophes

- Possessive apostrophes correctly used.
- Possessive apostrophes incorrectly used.
- Possessive apostrophes omitted.
- Correct abbreviation.
- Incorrect abbreviation.

Sentence Structure

- Simple sentences.
- Multiple sentences •
- Instances of coordination e.g. " I walked out on to the stage and in front of me was a huge crowd of people."
- Instances of subordination e.g. "All these questions were running through my mind as I sat shaking in the waiting room, where every other contestant was sat with their supporters."

Word level features

- Categorising spelling errors.
- Linguistic sophistication.

Information regarding sentence demographics (average sentence length, average word length) will be extracted by the research team, using keyed transcripts of the 100 word extract and computer software.

A whole text analysis, of features seen in the entire answer to the question. The script sample will ultimately comprise 60 boys and 60 girls at each grade.

Paragraphs

- Number of paragraphs
- Use of paragraphs
- Paragraph links

Reader-writer relationship

- How crafted does the piece feel?
- How well-paced does the piece feel?
- Consistency of the narrative perspective