
Examining Linguistic Complexity in Museum Guides: Towards Easy Language Content

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Abstract & Keywords

English:

Easy Language, also known as Easy-to-Read, is a simplified language variety that aims to facilitate reading and language comprehension that can be applied to written, oral and multimodal content. It follows specific recommendations regarding wording, structure, design, and evaluation (AENOR 2018; ISO 2023). In this paper, we will report on the results of a corpus study of two Catalan guides, one in standard Catalan (from the Museu Memorial de l'Exili) and the other in Easy Language Catalan (from the Museu d'Història de Catalunya). The former uses standard Catalan and are addressed to the general public, while the latter are written and validated in Easy Language. We have performed a morphosyntactic, lexical, and manual analysis of the subcorpora. The parameters considered were average sentence length, mean verb per sentence, parts-of-speech distribution, corpus aboutness, frequency of *-ment* adverbs, word length, lexical diversity, vocabulary richness, information load, and two readability indexes: the Gunning Fog Index and the Flesch-Szigriszt Index. The analysis aims to study the linguistic complexity and readability of written museum guides in standard Catalan, using the guide from the Museu Memorial de l'Exili as a case study and to identify the differences in approach between standard guides and the simplified versions using Easy Language.

Keywords: easy language, linguistic complexity, readability, museum guides, Corpus analysis

1. Introduction

The implementation of Easy Language in museum content has been increasing lately in Spain (García Muñoz and Matamala 2021). While until now this adaptation of content has been generally in written formats, there have been suggestions to also use Easy Language in museum audio guides (Berdud et al. 2014; Matamala 2023). Christopher Taylor and Elisa Perego (2020) further suggest using Easy Language in audio descriptive guides and enriched guides, considering that these types of guides can be useful for a wide range of users.

This study aims to analyse the linguistic complexity and readability of written museum guides, focusing on those from the Museu Memorial de l'Exili (Exile Memorial Museum) as a case study. The objective is to identify differences in approach between standard guides and simplified versions using Easy Language in terms of linguistic aspects. Since the Museu Memorial de l'Exili currently does not offer Easy Language guides, data from another Catalan history museum, the Museu d'Història de Catalunya (History Museum of Catalonia) will be used for comparison. The corpus will be examined through both qualitative and quantitative methods, considering morphosyntactic and lexical aspects. As the study specifically concentrated on Easy Language, aspects related to Plain Language, such as semantics or pragmatics, were not included in the analysis.

This article will start with an introduction to Easy Language, followed by a short review of the studies that have been done regarding Easy Language in museums. Additionally, it will provide an overview of the current state of museum accessibility for users with cognitive disabilities in Catalonia. In Section 4, the methodology will be presented, followed by the morphosyntactic analysis in Section 5, the lexical analysis in Section 6, and the readability indexes in Section 7. Finally, the conclusions will be given in Section 8.

2. Easy-to-Understand Language

Easy-to-Understand (E2U) language refers to 'any language variety which enhances comprehensibility' (ISO 2023). Such varieties are known by a wide array of terms, such as Easy-to-Read, Easy Reading, Easy Read, Easy Language, Plain Language, Simple Language, Simplified Language, Clear Writing, etc. (Matamala 2022).

While these varieties share many characteristics (Arias-Badia and Matamala 2023; ISO 2023), Plain Language (PL) generally aims to simplify specialised language for non-professionals, while Easy Language (EL) aims to make texts accessible to people with reading and understanding difficulties (Lindholm and Vanhatalo 2021). As such, EL is usually more simplified than PL (Arias-Badia and Matamala 2023; Lindholm and Vanhatalo 2021).

ISO/IEC 23859:2023 (ISO 2023) defines PL as a 'language variety whose wording, structure, and design are so clear that the intended readers can easily find what they need, understand what they find, and use that information'.

As defined in the Spanish standard UNE 153101:2018 EX (AENOR 2018), EL (referred as 'Easy-to-Read' in the text) is a 'method that includes a set of guidelines and recommendations related to the writing of texts, the design/layout of documents and validation of their understandability, intended to make information accessible to people with reading comprehension difficulties'. EL can be useful to many types of users, such as individuals with intellectual disability, cognitive and linguistic difficulties, specific language disorders, brain damage, autism spectrum disorder, hearing impairment, effects of the aging process, low levels of literacy, and lack of knowledge of the language (AENOR 2018; Centre for Inclusive Design 2020; Lindholm and Vanhatalo 2021).

Some basic EL recommendations are using simple sentences and abstaining from complex sentence structures. This involves avoiding compound or unusual verb tenses, refraining from using subjunctives, conditionals, and the passive voice, as well as employing two or more verbs together. Additionally, affirmative sentences are preferred whenever feasible, and information should not be omitted, ensuring that users do not need to make inferences to understand the content fully. Regarding vocabulary, EL advocates for the use of simple and common words while avoiding complex or abstract terms and overly lengthy words. Furthermore, adverbs ending with *-mente* should be avoided (AENOR 2018; García Muñoz 2012).

In addition to the UNE (AENOR 2018) and ISO guidelines (ISO 2023), as well as the recommendations from Óscar García Muñoz (2012), various other guidelines and recommendations concerning E2U language and its varieties exist, such as the ones from the European

Commission (2012), IFLA (2010), ILSMH-EA (1998), and Inclusion Europe (2009).

Research on different aspects of E2U languages has been prolific, such as technological development (Saggion et al. 2011; Saggion et al. 2015), end users and the usefulness of the recommendations (Bernabé-Caro 2017; Bock 2018; Bock 2019; Fajardo et al. 2014; Pappert and Bock 2020), and, recently, audiovisual content (Bernabé-Caro et al. 2020; Bernabé-Caro 2020; Bernabé-Caro and Cavallo 2021; Bernabé-Caro and García 2019; Bernabé-Caro and Orero 2019; Bernabé-Caro and Orero 2020).

3. Easy Language in museum accessibility

According to the International Council of Museums (2021), a museum is ‘a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment’. Furthermore, the Universal Declaration of Human Rights and the European Disability Strategy consider access to cultural sites a right irrespective of cognitive, sensory, or physical ability (European Commission 2021; UN General Assembly 1948).

Currently, EL has started being offered as an accessibility service in museums. For instance, Stefania Span, Patrizia Clementi and Deborah Arbulla (2019) discuss the Museo Accessibile project, which has adapted museum texts from the Civic Museum of Natural History of Trieste into EL. Their target users include not only individuals with intellectual disabilities but also children, the elderly, individuals with limited education, and those unfamiliar with the Italian language. Claudia Seibel and Laura Carlucci (2021) focus on simplifying vocabulary as they describe the linguistic and textual process of translating museum texts from the Archaeological and Ethnological Museum of Granada into EL. Finally, Óscar García Muñoz and Anna Matamala (2021) note the growing adoption of EL in Spain's cultural sector, particularly in museums. This trend extends beyond EL Spanish, evident in institutions like the Prado Museum and the Thyssen Museum, and includes other co-official languages such as Galician (Provincial Museum Network of Lugo) and Catalan (Empordà Museum, Majorca Maritime Museum, Maricel Museum, Manacor History Museum, and Ceramics Museum, among others).

Museums in Catalonia are currently improving their accessibility in line with the Museums 2030 Plan for Museums in Catalonia (Departament de Cultura 2017). The plan outlines various strategies aimed at a new museum vision, with the goal of achieving full implementation by 2030. At present, in Catalonia 24 per cent of the registered museums at the Museum Register of Catalonia offer accessibility services for people with cognitive disabilities using EL or augmentative and alternative communication systems (Departament de Cultura 2020).

EL is not only applicable to written museum guides, but also to audio guides. Audio guides are a means of communication that deliver cultural information (Lee 2016) that can enhance the museum experience for all users, including people with intellectual disabilities (Martins 2012).

Museum audio description (AD) and audio descriptive guides have gained prominence in recent years, as evidenced by various research works (Eardley et al. 2017; Hutchinson and Eardley 2019; Hutchinson and Eardley 2021; Jiménez-Hurtado and Soler Gallego 2015; Neves 2012; Perego 2019; Randaccio 2017; Randaccio 2018; Randaccio 2022; Soler Gallego and Luque Colmenero 2018; Taylor and Perego 2022; Vilatte 2007).

As noted by Rachel Hutchinson and Alison Eardley (2021) and Belén Ruiz (2008), audio descriptive guides can reduce cognitive load by offering consistent visual and auditory cues to sighted users. This means that they have the potential to help not only blind and visually impaired users, but users with cognitive disabilities as well. Additionally, the techniques employed in AD may enhance the nature and level of engagement for sighted visitors, as well as the memorability of the experience (Hutchinson and Eardley 2021).

Nonetheless, museum AD can often be rich in vivid language, incorporating technical terms and semantic complexity. By using EL, the quantity and complexity of the information would be reduced, which would result in ‘an immediate, clear, empathetic and concise communication’ and would enhance accessibility for a wide range of users, including individuals with intellectual and learning disabilities (Taylor and Perego 2020). In a manual for museum accessibility, Liz Zúñiga Robles (2019) also advocates for the integration of EL into museum AD and recommends the use of multimedia guides as a communication solution for users with cognitive disabilities. These devices would include audio-navigation, audio-description, subtitles, and sign language features. Similarly, María Luisa Berdud et al. (2014) also mention adhering to EL guidelines in order to offer ‘easy audios’, which they define as ‘easy-to-understand auditive information that explains the information offered in a simplified language, particularly regarding historical context, technical terms, etc.’.

Conversely, Monica Randaccio (2022) considers that the characteristics of museum AD (vivid and rich vocabulary, technical terms and metaphors) may contradict EL recommendations, such as avoiding lexical diversity, using simple words and straightforward syntax. Another concern raised by the author is regarding the acceptability of these simplified guides, a subject also approached previously by other authors (Hansen-Schirra and Maaß 2020; Maaß 2020). However, Ulla Bohman (2021) points out that the guide in EL at the Army Museum in Sweden gained popularity beyond its intended audience of users with intellectual disabilities, to the extent that the museum had to print additional copies.

Recent studies also highlight the enhanced effectiveness of enriched AD and multisensory approaches to AD of art and environments (Dobbin, Eardley and Neves 2016; Eardley et al. 2016; Eardley et al. 2017; Neves 2010; Neves 2012; Neves 2016; Randaccio 2018). These approaches are deemed more engaging and conducive to the long-term memory of the museum experience (Taylor and Perego 2020). Eardley et al. (2017) further suggest that a multisensory experience incorporating imagery or perceptual elements, along with semantic or factual information, could enhance memorability.

Joselia Neves (2016) defines these enriched descriptive guides as ‘[audio] guides, in which factual information has been “enriched” through the creative use of description, sound effects and music, to provide thinking prompts that fuel the senses, invite cognitive and/or physical exploration, and capture the uniqueness of the cultural context the guide relates to’. This enrichment can also be textual, such as the word choice and style, cultural references, and personal interpretations. Taylor and Perego (2020) suggest using EL in these enriched contents as well, but the effect on user comprehension remains uncertain.

4. Methodology

This study used museum guides from two institutions as a corpus: one from the Museu Memorial de l'Exili and one from the Museu d'Història de Catalunya. The Museu Memorial de l'Exili, situated in La Jonquera, Catalonia, is dedicated to commemorating the Spanish Civil War and the subsequent exile, with a specific focus on the experiences of Catalans who sought refuge in France. On the other hand, the Museu d'Història de Catalunya, located in Barcelona, offers insights into Catalan culture and history from prehistory to the 21st century. For the purposes of the analysis, the Museu Memorial de l'Exili subcorpus will henceforth be referred to as ‘MUME’, and the Museu d'Història de Catalunya subcorpus as ‘MHC’. This study aims to analyse the linguistic complexity and readability of written museum guides, using MUME's guides as a case study and to identify the differences in approach between standard guides and the simplified versions using EL.

The MHC subcorpus was created by the Associació Lectura Fàcil (Easy-to-Read Association). Texts from audio recordings were omitted from the MUME subcorpus due to the inclusion of unscripted interventions and interventions in other languages, which might introduce bias and compromise the accuracy of the analysis. Conversely, all available texts were included in the MHC subcorpus, as there were no elements present that could potentially skew the results.

Table 1 provides basic information about each subcorpus, including details on language variety, year of production, and the counts of tokens and types. Tokens represent the overall word count in the corpus, whereas types denote the total number of unique words (Baker, Hardie and McEnery 2006). For instance, if the word ‘war’ appears 56 times within a text, it is considered as one type but 56 tokens.

Corpus	Tokens	Types	Year	Language
MUME	11,302	2,745	2020	Standard Catalan
MHC	2,510	863	2021	EL Catalan

Table 1: Corpus description

The corpus was analysed using the methodology outlined by Blanca Arias-Badia and Anna Matamala (2023), which involved examining it from both morphosyntactic and lexical viewpoints, as detailed below.

The open-access tool Contawords@[1], developed by the Institute for Applied Linguistics at the Universitat Pompeu Fabra (Barcelona, Spain), was used to automatically lemmatise the corpus, perform part-of-speech (PoS) tagging, and identify the most frequent bigrams within the corpus. Lemmatisation involves reducing the words in a subcorpus to their corresponding lexemes or base forms. For example, ‘is’, ‘are’, and ‘was’ are all considered variations of the same lemma for the verb ‘be’. In contrast, PoS tagging assigns each word a grammatical category, such as nouns, verbs, or adjectives. Finally, bigrams are pairs of adjacent words occurring together in the corpus (Baker, Hardie and McEnery 2006).

At the morphosyntactic level, an analysis of sentence complexity and PoS distribution was conducted. Sentence complexity was examined by assessing sentence length, mean verbs per sentence, and the occurrence of verbal periphrases to gain insights into the syntactic structures of the text. Analysing sentence complexity and PoS distribution can offer insights into the comprehensibility of the texts. For instance, complex sentence structures, indicated by a high average number of verbs per sentence or long sentence length, may render the text challenging to read or understand. Furthermore, to complement these analyses, a manual analysis was conducted to identify how verbs were utilised concerning verb tenses and the passive voice.

At the lexical level, the following aspects were considered: corpus aboutness, mean word length, and lexical density, encompassing aspects such as type-token ratio (TTR), vocabulary richness, and information load. Additionally, the corpus was manually analysed to identify the use of foreign words, neologisms, complex terms, idioms, and figurative meanings, as well as the use of adverbs with the Catalan suffix *-ment* (*-ly* in English).

Corpus aboutness is ‘the extent to which individual linguistic features characterise the corpus as a whole’ and ‘can be described by the set of words found to score most highly on these measures’ (Oakes 2012). To evaluate the corpus aboutness, Contawords@ was utilised to extract the 30 most frequently occurring content words (nouns, verbs, adjectives, adverbs, and named entities) from each subcorpus. This facilitated determining whether uncommon or complex words were frequently employed in the museum guides.

The lexical variation was computed using the type-token ratio (TTR) to assess lexical density. A high type-token ratio indicates lexical diversity in the text, while a lower ratio suggests repetitions (Baker, Hardie and McEnery 2006). Vocabulary richness was determined by dividing the number of lemmas by the number of tokens, and information load was measured by dividing the number of content words (nouns, adjectives, adverbs, verbs, and named entities) by the number of tokens.

Finally, two readability indexes were used to analyse the corpus from both morphosyntactic and lexical perspectives: the Gunning Fog Index and the Flesch-Szigriszt Index. As noted by Arias-Badia and Matamala (2023), Perego (2019) employs the Gunning Fog Index to compare the comprehension difficulty of film and art audio description in English. This index has traditionally been utilised as a readability formula that indicates the relationship between syntactic complexity, determined by sentence length, and the occurrence of complex words. Although Arias-Badia and Matamala (2023) do not use it, the Flesch-Szigriszt Index was also incorporated into the analysis because it has been validated for Spanish (Barrio Cantalejo 2007) and is commonly used for Catalan (Pérez Colomé 2011). This index considers the number of syllables, words, and sentences in the text. The counting of syllables was performed using the online syllable counters from Softcatalà@[2].

To calculate the two indexes, a random sample of 100-150 words was chosen from each subcorpus as per the recommendations from Readability Formulas@[3]. The Gunning Fog Index was determined using an online calculator@[4], whereas the Flesch-Szigriszt Index was computed using the formula validated by Ines Barrio Cantalejo (2007).

5. Morphosyntactic analysis

This section presents the results yielded from linguistic features associated with sentence complexity, namely the mean sentence length and the mean verb per sentence, and the presence of verbal periphrasis. The PoS distribution has also been analysed.

5.1. Sentence complexity

As shown in Table 2, the MUME subcorpus in standard Catalan has a mean sentence length of 28.4, while the MHC subcorpus in EL Catalan exhibits a mean sentence length of 16.6. As a point of comparison, the mean sentence length found in the Catalan Web 2014 corpus is 20.99 (Hermosa-Ramírez 2021) and the European Commission (2012) recommends an average length of 20 words to write clearly.

The mean sentence length of the MUME subcorpus exceeds both the average observed in the Catalan Web corpus and the length recommended by the European Commission, suggesting that this museum guide is quite complex to read and may use complex sentence structures. In contrast, the sentence length of the MHC subcorpus falls below the established average in the Catalan Web and the

European Commission recommendations, indicating that these EL guide is more likely to be easier to read and use simpler sentence structures.

The analysis of mean verbs per sentence shows that the MUME subcorpus averages 3.1 verbs per sentence, further suggesting a prevalence of complex sentence structures within the subcorpus. The MHC subcorpus has 2.1 verbs per sentence on average. A manual analysis reveals that complex sentences in the MHC subcorpus typically consist of copulative or adversative coordinated structures, which are deemed acceptable in EL texts. Additionally, subordinated causal, final, temporal, conditional, and comparative structures are also considered acceptable (García Muñoz 2012). Thus, while the MHC subcorpus exhibits an average of two verbs per sentence, this does not necessarily imply that the sentence structures are difficult to comprehend, as they adhere to these recommendations.

Corpus	Tokens	Types	Sentence length	Mean verbs per sentence
MUME	11,302	2,745	28.4	3.1
MHC	2,510	863	16.6	2.1

Table 2: Sentence complexity results

5.2. Verbal periphrases

Verbal periphrases do not appear often in the MUME subcorpus, as illustrated in Table 3. The most frequently used periphrases have four and three occurrences each. Furthermore, upon examining the ten most frequent periphrases (of which only half have more than one occurrence), it becomes apparent that these periphrases use the Catalan modal verbs ‘poder’ [can] and ‘voler’ [want], which are exceptions to the UNE recommendation of avoiding periphrases. Verbal periphrases are even less common in the MHC subcorpus. There are only five instances observed, with each periphrasis appearing only once. However, it is worth noting that these periphrases do not use the modal verbs exempted from the recommendation.

MUME			MHC		
Periphrases	Translation	Occurrence	Periphrases	Translation	Occurrence
Poder ser	‘to be able to be’	4	Soler participar	‘to usually participate’	1
Poder veure	‘can be seen’	3	Seguir sent	‘continue being’	1
Poder retornar	‘to be able to return’	2	Intentar fer	‘to try to do’	1
Poder passar	‘to be able to pass’	2	Fer canviar	‘to change’	1
Poder fugir	‘to be able to flee’	2	Continuar utilitzant	‘continue using’	1
Poder viatjar	‘to be able to travel’	1			
Poder trobar	‘to be able to find’	1			
Poder tornar	‘to want to return’	1			
Poder sortir	‘to be able to leave’	1			
Voler ser	‘to intend to be’	1			

Table 3: Frequent periphrases in the corpus

5.3. PoS distribution

The PoS distribution, which reveals that nouns are the most prevalent lexical category in both subcorpora, aligns with previous analyses of Catalan corpora, which have also identified nouns as the dominant PoS (Arias-Badia and Matamala 2023; Hermosa-Ramírez 2021). In the MUME subcorpus, nouns account for 46.1 per cent of the words, whereas in the MHC subcorpus, this percentage increases to 50.2 per cent. The MUME subcorpus has a higher proportion of named entities, as it makes references to many locations, organizations, and people relevant to the exile. Conversely, the MHC subcorpus is more general and does not specify as much, which leads to an apparent higher frequency of nouns.

Similarly to the other corpus analyses, verbs are the second most frequent category of words in the subcorpora. In the MUME subcorpus, verbs account for 20.3 per cent of the words, whereas in the MHC subcorpus, the percentage is higher at 24 per cent. This higher proportion of verbs seems to indicate that the MHC subcorpus follows the European Commission (2012) recommendation of using more verbal forms instead of nominalised verbs.

Finally, both subcorpora have a similar usage frequency of adverbs and adjectives. Specifically, in the MUME subcorpus, adverbs and adjectives account for 4.5 per cent and 13.7 per cent of the words respectively, while in the MHC subcorpus they account for 5.1 per cent and 13.8 per cent of the words.

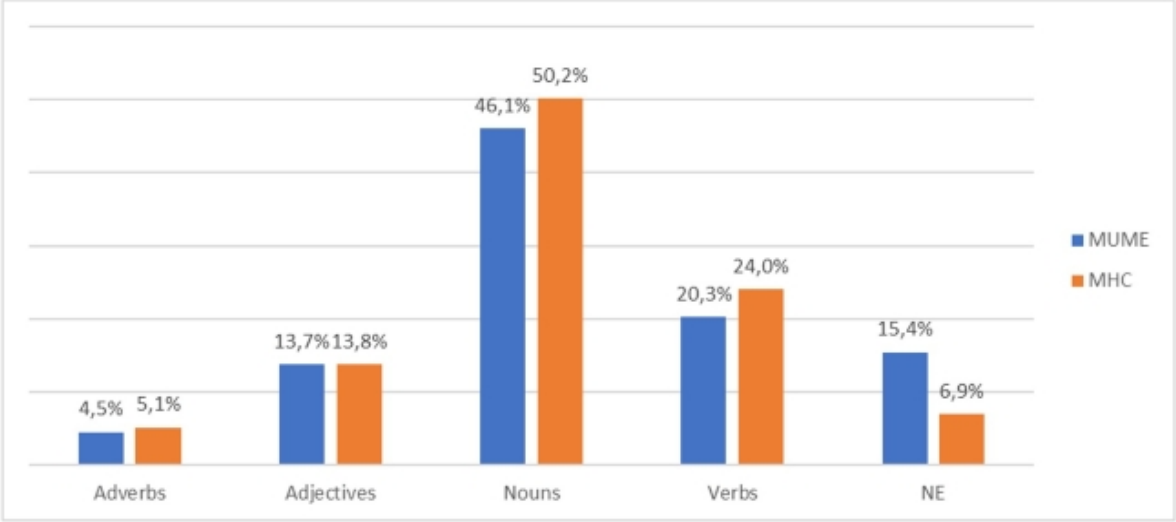


Fig. 1: PoS distribution in the corpus

The manual analysis reveals that the MUME subcorpus predominantly utilises the past simple tense, typically reserved for literary or poetic contexts in standard Catalan. Given that these texts are intended for the general public, a more appropriate tense would be the periphrastic past tense. For example, instead of ‘ell parlà’, ‘ell va parlar’ [he spoke] should be used. Furthermore, the frequent use of the passive voice in conjunction with the past simple tense contributes to the complexity of the texts and hinders comprehension. Some examples are the following:

‘La insurrecció militar fou continguda en llocs clau, com Barcelona o Madrid, gràcies a l’acció combinada dels sectors populars’ [The military insurrection was contained in key locations such as Barcelona or Madrid, thanks to the combined action of popular sectors]

‘[el llibre] fou segrestat per la censura’ [[the book] was seized by censorship]

‘La possibilitat d’embarcar-se cap a Amèrica fou vista pels exiliats republicans com un alliberament’ [The possibility of embarking for America was seen by Republican exiles as a liberation].

The second example is particularly confusing due to several factors. Firstly, it uses the passive voice together with the past simple. Secondly, the verb used in Catalan ‘segrestar’ can mean both ‘to seize’ and ‘to kidnap’. Thirdly, the omission of the subject makes it easy to misinterpret the text, leading one to assume that the author was kidnapped instead of the book being seized.

On the one hand, the MHC subcorpus predominantly employs the present tense, which, with a past value, can be used for the so-called historical present to refer to past events that continue to be relevant in the present. For example: ‘Al camp, la indústria rural comença a preparar la població per a la Revolució industrial’ [In the countryside, rural industry begins to prepare the population for the Industrial Revolution.]. When combined with other past tenses, the historical present can also be used to give greater vivacity to oral or written narratives (Institut d’Estudis Catalans 2018), which is the case in this subcorpus, as the imperfect tense and the past periphrastic are also used.

6. Lexical analysis

This section presents the results from the lexical analysis, namely the corpus aboutness, word length, and lexical variation.

6.1. Corpus aboutness

To study the corpus aboutness, the thirty most frequent content words in each subcorpus were analysed. Table 4 shows the list and their occurrence for each subcorpus.

Corpus	Corpus aboutness
MUME	ser (237), anar (147), no (91), haver (88), republicà (68), exili (52), guerra (48), camp (48), molt (45), fer (45), segon (43), més (42), poder (41), gran (40), tenir (38), refugiat (38), francès (36), Franco (34), català (32), espanyol (31), Barcelona

(31), Catalunya (30), passar (29), estar (29), França (28), militar (27), primer (25), després (23), polític (22), franquista (22)

MHC ser (42), més (16), molt (16), Catalunya (16), poder (15), segon (12), tenir (10), persona (10), nou (10), classe (10), fer (9), conreu (9), treballar (8), també (8), fàbrica (8), forma (8), feina (8), català (8), activitat (8), créixer (7), començar (7), vinya (6), vi (6), tèxtil (6), social (6), rei (6), primer (6), poc (6), indústria (6), família (6)

Table 4: Corpus aboutness

The verbs found in the MUME corpus aboutness: ‘ser’ [be], ‘anar’ [go], ‘haver’ [be], ‘fer’ [do/make], ‘poder’ [can], ‘tenir’ [have], ‘passar’ [pass] and ‘estar’ [be] are all highly frequent in common language. These verbs range in frequency from over 116,000 occurrences for ‘passar’ to over 1,700,000 occurrences for ‘ésser’ in the Corpus textual informatitzat de la llengua catalana (CTILC), the general-use language corpus of the Institute for Catalan Studies. Similarly, the most frequent adverbs in the MUME subcorpus are also commonly used, with occurrences ranging from over 98,000 for the least frequent adverb ‘després’ [after] to over 1,000,000 for the most frequent adverb ‘no’ [no].

The adjectives of the MUME subcorpus are not all equally common. Some of them, ‘primer’ [first], ‘segon’ [second], ‘gran’ [big], ‘català’ [Catalan], ‘espanyol’ [Spanish] and ‘polític’ [political], range from over 20,000 occurrences to over 140,000. However, the other adjectives are less common, like ‘franquista’ [Francoist], ‘militar’ [military] and ‘refugiat’ [refugee], which do not reach 10,000 occurrences in the CTILC, and ‘republicà’ [republican] and ‘francès’ [French], which appear fewer than 20,000 times. Nonetheless, it should be noted that although ‘francès’ is not a rare word, its frequency is limited by the subject matter of the texts in the CTILC. Finally, the most frequent nouns in the MUME subcorpus are personal names, ‘Franco’, or location names, ‘Barcelona’, ‘Catalunya’ [Catalonia] and ‘França’. [France]. The nouns ‘guerra’ [war] and ‘camp’ [camp] are also quite common, with occurrences between 28,000 and 31,000, while ‘exili’ [exile] is the only uncommon noun that appears, with only 2,700 occurrences in the CTILC.

The MHC subcorpus shares most of the most frequent verbs with the MUME subcorpus, apart from the verbs ‘treballar’ [work], ‘créixer’ [grow] and ‘començar’ [start], which although highly common as well, have less occurrences in the CTILC. The most frequent adverbs are also highly common, with ‘poc’ [few], ‘també’ [also], ‘molt’ [many], ‘més’ [more] ranging from over 80,000 appearances in the CTILC for the least frequent to over 5,500,000 appearances for the most frequent. Among the most frequent adjectives, ‘segon’, ‘primer’ and ‘català’ appear again, along with ‘nou’ [new] and ‘social’ [social], which have over 87,000 and 39,000 occurrences respectively. The only outlier is the adjective ‘tèxtil’ [textile], which only appears 1,600 times in the CTILC. Finally, the most frequent nouns in this subcorpus are ‘Catalunya’, ‘persona’ [person], ‘classe’ [class], ‘conreu’ [cultivation], ‘fàbrica’ [factory], ‘forma’ [manner], ‘feina’ [work] ‘activitat’ [activity], ‘vinya’ [vineyard], ‘indústria’ [industry] and ‘família’ [family]. In contrast to the MUME subcorpus, there is only one location name. Most of the nouns range between over 20,000 and 60,000 occurrences, with the exception of the words ‘conreu’ and ‘vinya’, which appear less than 6,000 times.

As observed, both subcorpora use highly frequent words in general. The less frequent words tend to be the adjectives and nouns, which also coincides with the use of more specific terms, such as ‘exili’ or ‘tèxtil’. The MUME subcorpus appears to use a greater number of specific vocabulary, compared to the MHC subcorpus.

No instances of neologisms were found in either subcorpus, and only two foreign words were found in the MUME subcorpus: *ikurriña* and *harkis*. Additionally, there are instances where a concept is referred to by different terms in the MUME subcorpus. For example, while the terms ‘exili’, ‘éxode’, ‘retirada’ and ‘diàspora’ are sometimes used interchangeably within the text, in other instances they are used with different nuances. Likewise, there were cases where the same term was used to describe different concepts. ‘Front català’ [Catalan front] is used both to refer to the physical borders and a political coalition.

6.2. Usage of –ment adverbs

Table 5 presents the adverbs with the suffix *–ment*, often translated into English as ‘-ly’. This suffix is added to the feminine or invariable form of adjectives to form adverbs, commonly indicating manner, place, time, and other related aspects.

In the MUME subcorpus, *–ment* adverbs appear 65 times. While this number is not particularly high, many of these adverbs could be replaced with simpler expressions to enhance the text’s flow and improve comprehension. In contrast, the MHC subcorpus does not contain any instances of *–ment* adverbs, aligning with the recommendation to avoid them (AENOR 2018). Furthermore, in Catalan the use of this type of adverbs can result in ‘heavy sentences’, which is not advised when trying to be clear (Serveis Digitals i Experiència Ciutadana 2022).

MUME					
<i>–ment</i> adverb	Occurrence	Translation	<i>–ment</i> adverb	Occurrence	Translation
especialment	7	‘specially’	inversament	1	‘inversely’
activament	6	‘actively’	malauradament	1	‘unfortunately’
posteriorment	6	‘subsequently’	juntament	1	‘together’
finalment	5	‘finally’	militarment	1	‘militarily’
Clandestinament	4	‘clandestinely’	naturalment	1	‘naturally’

actualment	3	‘actually’	eminentment	1	‘eminently’
plenament	2	‘fully’	durament	1	‘hardly’
inicialment	2	‘initially’	obertament	1	‘openly’
greument	1	‘seriously’	numèricament	1	‘numerically’
decididament	1	‘decidedly’	paral·lelament	1	‘in parallel’
conjuntament	1	‘together’	pràcticament	1	‘almost’
intensament	1	‘intensely’	substancialment	1	‘substantially’
principalment	1	‘mainly’	unànimement	1	‘unanimously’
immediatament	1	‘immediately’	veritablement	1	‘truly’
individualment	1	‘individually’	perfectament	1	‘perfectly’
difícilment	1	‘with difficulty’	espectacularment	1	‘spectacularly’
definitivament	1	‘definitely’	completament	1	‘completely’
certament	1	‘certainly’	col·lectivament	1	‘collectively’
internament	1	‘internally’	bàsicament	1	‘basically’

Table 5: -ment adverbs

6.2. Word length

Since both the Gunning Fog Index and the Flesch-Szigriszt Index (Section 7) consider the number of syllables in their complexity calculations, the average number of syllables of the corpus was measured. The results of this analysis are reproduced in Table 6.

Corpus	Tokens	Graphic criteria
MUME	11,302	1.73
MHC	2,510	1.71

Table 6: Mean word length

As can be seen, the MUME and the MHC subcorpora have a mean output of 1.73 and 1.71 respectively, indicating that both prefer shorter words. These results follow E2U language principles of giving preference to short words if possible. There is not an apparent difference between the two subcorpora, indicating that language variety, standard Catalan and EL Catalan, may not be relevant in terms of word length.

6.3. Lexical variation

Table 7 shows the results of the parameters chosen to measure lexical variation: lexical density (TTR), vocabulary richness, and information load.

Corpus	Tokens	TTR	Vocabulary richness (lemmas/tokens)	Information load (content words/tokens)
MUME	11,302	0.24	0.19	0.55
MHC	2,510	0.34	0.26	0.52

Table 7: Lexical density results

The results show that the MUME subcorpus has a TTR of 0.24, while the MHC subcorpus has a result of 0.34. While this indicates that the MHC subcorpus has a higher lexical density, it is important to note that the TTR tends to decrease as the length of the text increases (Perego 2019), and the MHC subcorpus is only 22 per cent of the length of the MUME subcorpus. Similarly, the MHC subcorpus is also richer in vocabulary (0.26) than the MUME subcorpus (0.19). Finally, both subcorpora carry a similar information load, albeit slightly lower in the MHC subcorpus with a score of 0.52, compared to 0.55 in the MUME subcorpus.

7. Readability indexes

This section presents the results of applying the Gunning Fog Index and the Flesch-Szigriszt Index to the subcorpora.

The Gunning Fog Index scores reveal a significant difference between the MUME and MHC subcorpora, with respective scores of 22.63 and 13.77. As a point of comparison, other Gunning Fog Index scores for EL Catalan texts are 13.1 and 16.3 (Arias-Badia and Matamala 2023), indicating that the MUME subcorpus has a high complexity level.

The Flesch-Szigriszt Index categorises readability into five levels: <40 ‘very difficult’, for university and scientific publications; 40-55 ‘fairly difficult’, for scientific divulgation, specialised media, and high school level; 55-65 ‘normal’, for general media, sports media, and secondary school level; 65-80 ‘fairly easy’, for elementary school level, magazines, or books; and >80 ‘very easy’, for elementary school level and comics (Barrio Cantalejo 2007). As shown in Table 8, the MUME subcorpus has a score of 49.92, which is considered fairly difficult, while the MHC subcorpus has a score of 61.37, indicating a normal difficulty.

Corpus	Tokens	Types	Gunning Fog Index	Flesch-Szigriszt
MUME	11,302	2,745	22.63	49.92
MHC	2,510	863	13.77	61.37

Table 8: Readability scores

8. Conclusions

This paper reports on the results of the corpus analysis of two museum guides, one in standard Catalan and one in EL Catalan. The corpus was explored through qualitative and quantitative methods with the aim of identifying the differences in approach between standard guides and the simplified versions using Easy Language.

As expected, the results reveal significant morphosyntactic differences between the two subcorpora. The MUME subcorpus has long and complex sentences and favours the past simple tense, which has a literary and poetic use in Catalan. On the other hand, the MHC subcorpus employs shorter sentences with simpler structures and uses the historic present tense, the periphrastic past, and the imperfect tense to give more vivacity to the text.

At the lexical level, the MUME subcorpus shows a greater use of specific terms, while the MHC subcorpus uses more general vocabulary. Neither subcorpora contains neologisms, and foreign words are rare, if they appear at all. Similarly, both subcorpora do not show a difference in terms of word length or information load.

The study indicates that the MUME guides, despite being intended for the general public, may present challenges in comprehension. Further investigation into the integration of EL into museum guides is recommended. Although concerns regarding acceptability and stigma have been raised (Hansen-Schirra and Maaß 2020; Maaß 2020; Randaccio 2022), evidence from Sweden suggests that simplified guides have been well-received by the general public (Bohman 2021). Therefore, assessing the potential acceptance of simplified guides among the general public could be a valuable next step in this line of research.

Moreover, conducting research on audio descriptive guides and exploring new multisensory approaches and enriched guides (Hutchinson and Eardley 2021; Neves 2010; Neves 2012; Neves 2016; Taylor and Perego 2020) would be valuable to understand if, as suggested, they can help users with cognitive disabilities and assess the feasibility of implementing Easy Language in them.

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Notes

- [1] See: [url=<http://contawords.iula.upf.edu:3110/>]<http://contawords.iula.upf.edu:3110/>[/url]
- [2] See: [url=<https://www.softcatala.org/sillabes/>]<https://www.softcatala.org/sillabes/>[/url]
- [3] See: [url=<https://readabilityformulas.com/>]<https://readabilityformulas.com/>[/url]
- [4] See: [url=<http://gunning-fog-index.com/index.html>]<http://gunning-fog-index.com/index.html>[/url]

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