

UNIVERSIDADE DE LISBOA
FACULDADE DE CIÊNCIAS, LETRAS, MEDICINA E PSICOLOGIA



**Cognitive and Neural Mechanisms Underlying Word Retrieval and Integration
during Sentence Comprehension**

Carla Sofia Tavares Frade

Orientador(es): Prof. Doutora Ana Luísa Nunes Raposo (FPUL)
Prof. Doutora Andrea Santi (UCL)

Tese especialmente elaborada para obtenção do grau de Doutor em Ciência Cognitiva

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Financiado pela Fundação para a Ciência e Tecnologia (SFRH/BD/92546/2013)

The research reported on this thesis was funded by
Fundação para a Ciência e a Tecnologia,
Doctoral Grant SFRH/BD/92546/2013



ACKNOWLEDGEMENTS

Este percurso não teria sido possível sem o apoio e suporte de inúmeras pessoas. Em primeiro lugar gostaria de agradecer às minhas orientadoras Prof. Ana Raposo e Prof. Andrea Santi. Durante estes anos o seu apoio científico foi fundamental, proporcionaram oportunidades enriquecedoras e estimulantes e incentivaram-me a aprofundar o meu rigor e competência científica. À Prof. Ana Raposo, gostaria também de agradecer o suporte na construção do projeto de doutoramento, que foi essencial para que conseguisse o financiamento para o mesmo. À Prof. Andrea Santi, o acolhimento na UCL e a forma crítica, mas sempre construtiva, com que analisou as diferentes etapas do doutoramento.

Gostaria também de agradecer o apoio da Prof. Ana Pinheiro, tão importante para delinear o estudo EEG. Agradeço também aos membros do grupo de investigação Cognition in Context pelas discussões científicas e pelo feedback ao trabalho que desenvolvi no âmbito desta tese.

O percurso foi bem melhor por ter contado com o apoio incansável e com a amizade de vários colegas. O meu muito obrigada por toda a ajuda, pelas partilhas e pelo convívio, Margarida Cipriano, Miguel Andrade, Marina Ferreira, Catarina Nunes, Maria Amorim, Luísa Corbal, Ana Lapa, Cristina Mendonça, Filipa Almeida, Mara Alves, Sofia Jacinto, João Braga, Cristiane Souza e Sara Soares. Por falar em amizade, não posso deixar de destacar amigos que sempre acreditaram em mim e estão lá sempre prontos a celebrar as minhas conquistas, mesmo que pequenas. Obrigada, Naldinha, Joana Frade, Ana Marques, Rui, Sara, Catarina, Carlos, Zenhas, Joana Silveira, Filipa Brandão, Daniela e Jóni. Ao Pincha, o companheiro das longas horas de revisão, o que estive lá sempre a apoiar-me, o que sempre acreditou, o que me levantou cada vez que perdi forças, estarei sempre grata.

Tudo isto não seriam possível, tudo isto não faria sentido, sem o apoio, sem o amor, da minha família. Aos meus pais, à minha irmã, aos meus avós, tias e tios e primos devo tudo. O meu profundo e infinito obrigada.

RESUMO

O processamento das palavras é facilitado quando estas surgem numa frase com um contexto que lhes dá suporte. Porém, a natureza dos processos subjacentes a este efeito é ainda pouco clara. Numa abordagem multimodal, os estudos empíricos desta dissertação investigaram como é que os processos de acesso e integração de palavras são implementados e interagem durante a compreensão de frases, atendendo ao contexto frásico e à expectativa das palavras.

Nos estudos comportamental e eletrofisiológico, observou-se uma facilitação na leitura de todas as palavras esperadas, i.e., não apenas as mais esperadas, mas também as segundas palavras mais esperadas. Os potenciais evocados mostraram que o efeito de facilitação é inicialmente restrito às palavras mais esperadas e manifesta-se mais tardiamente para as segundas palavras mais esperadas. Adicionalmente, estes efeitos não foram modelados pelas características da tarefa nem pelas capacidades dos leitores, tratando-se de um efeito robusto e consistente. O estudo de fMRI revelou padrões de ativação distintos em duas sub-regiões do córtex frontal inferior esquerdo. Na sub-região anterior, a ativação foi maior durante o processamento de frases completadas com palavras inesperadas comparativamente a palavras esperadas, apenas quando o contexto frásico era muito restritivo e ainda durante o processamento de frases com palavras esperadas em que o contexto frásico era pouco restritivo relativamente a contextos muito restritivos, sugerindo que esta região está associada ao acesso semântico de palavras. A sub-região posterior, além de apresentar resultados semelhantes aos da sub-região anterior, revelou maior ativação para frases completadas com palavras inesperadas em contextos muito restritivos comparativamente a contextos pouco restritivos. Logo, esta região parece ser recrutada em frases que promovem a ativação de várias palavras e,

consequentemente, requerem um esforço adicional para selecionar e integrar a palavra alvo.

Estes resultados enfatizam o papel dos mecanismos preditivos no acesso às palavras durante a compreensão de frases. Estes mecanismos ocorrem de forma serial e gradativa, são desencadeados automaticamente e são consistentes, independentemente das capacidades dos leitores. Esta evidência contribui para o desenvolvimento dos modelos de compreensão da linguagem.

Palavras-chave

acesso às palavras, integração de palavras, mecanismo preditivos, compreensão de frases

ABSTRACT

The processing of words is facilitated when they appear in a sentence with a supportive context. Yet, the nature of the processes underlying that effect is still unclear. In a multimodal approach, the empirical studies of this dissertation investigate how word retrieval and integration are implemented and interact during sentence comprehension, according to the sentence context and word's expectation.

In the behavioural and electrophysiological studies, the facilitation effect during sentence reading was found for all expectable candidates, i.e., not only for the most expected words, but also for the second-best words. The event-related potentials revealed that the facilitation effect is initially restricted to the most expected word, with the second-best word demonstrating a delayed effect. Additionally, the facilitation effect was not affected by task demands or readers' abilities, showing that the effect is robust and consistent. The fMRI study showed distinct patterns of activation in subregions of the LIFG. In the anterior subregion, the expectancy effect was restricted to high constraint sentences and the expected words triggered more activation in low than in high constraint sentences, suggesting that this region is involved in lexical-semantic retrieval. The posterior subregion, besides showing similar results as the ones found in the anterior subregion, also revealed an enhanced activation for unexpected words in high constraint sentences compared with low constraint sentences. Thus, the posterior LIFG was recruited by sentences that endorsed the retrieval of multiple words and, consequently, require greater effort to select and integrate the candidate word.

The findings highlight the impact of the predictive mechanisms on word retrieval during sentence comprehension. These mechanisms seem to occur in a serial and graded

way, are triggered automatically and are consistent despite readers capacities. This evidence contributes to the further development of language comprehension models.

Key-words

word retrieval, word integration, predictive mechanisms, sentence comprehension

RESUMO ALARGADO

Uma determinada palavra é processada mais rapidamente quando surge numa frase que lhe dá suporte, i.e., quando o contexto prévio fornece pistas sintáticas e semânticas sobre a palavra subsequente, do que quando surge numa frase em que o contexto é neutro, i.e., pode ser completado com uma ampla gama de palavras. Duas propostas principais sobre os processos cognitivos subjacentes ao efeito de facilitação do contexto têm sido avançadas na literatura. De acordo com a proposta com foco nos mecanismos de integração, o efeito de facilitação ocorre porque há uma maior correspondência entre as propriedades semânticas do contexto e da palavra-alvo (e.g., Hagoort, 2006). Por outro lado, segundo a proposta que enfatiza mecanismos preditivos, o efeito de facilitação ocorre porque o contexto frásico permite a antecipação das palavras seguintes (e.g., DeLong, Urbach, & Kutas, 2005). Os estudos experimentais desenvolvidos nesta tese investigaram os processos de acesso e integração das palavras durante a leitura de frases, explorando a natureza e a extensão destes processos, o seu nível de automaticidade e os eventuais custos envolvidos, integrando evidências comportamentais, de EEG e de fMRI.

O primeiro estudo experimental (Capítulo 2) apresenta uma base de dados normativa da probabilidade de uso das palavras para completar 806 contextos frásicos em português europeu, uma vez que não existiam até à data dados validados para população adulta portuguesa. Estes valores foram subsequentemente usados para selecionar os materiais dos restantes estudos empíricos. Os dados foram obtidos com recurso a tarefas de *cloze probability* (Taylor, 1953), integrando dois paradigmas distintos: o de produção singular (Experiência 1) e o de produção múltipla (Experiência 2). Para cada contexto frásico foi computada a probabilidade de uso de cada palavra, o *type-token ratio* e a

proporção de respostas idiossincráticas. Os resultados demonstraram elevada consistência entre os paradigmas e entre os métodos de cálculo dos valores (primeira resposta *vs.* respostas múltiplas).

O estudo apresentado no Capítulo 3 investigou a extensão do efeito de facilitação das palavras durante o processamento de frases, *i.e.*, se o efeito se restringe à palavra mais esperada ou se se dissemina para todas as palavras esperadas (mesmo que em menor grau). Comparámos não apenas o processamento da palavra mais esperada *vs.* inesperada, tal como realizado em estudos anteriores, mas também analisámos o processamento da segunda palavra mais esperada. Os resultados mostraram tempos de leitura mais rápidos para as palavras subsequentes à palavra-alvo, tanto quando a palavra-alvo era a mais esperada como quando era a segunda mais esperada, demonstrando que há um efeito de facilitação para todas as palavras esperadas. Examinou-se também a automaticidade e a constância deste efeito. Para tal, diferentes conjuntos de frases foram apresentados no início da tarefa, antes das frases experimentais, em que se manipulou o nível de restrição das frases e a proporção de frases completadas com palavras esperadas e inesperadas, criando cenários mais ou menos favoráveis para antecipar as palavras subsequentes. Os tempos de leitura das frases experimentais não diferiram em função do tipo de frase inicialmente apresentado, mostrando que o efeito de facilitação promovido pelo contexto é independente das características da tarefa. Por último, diferenças individuais entre participantes, especificamente na fluência de leitura e na memória de trabalho, não afetaram de forma consistente e significativa o efeito de facilitação, demonstrando que este é generalizável a todos os leitores.

Com recurso ao EEG, o Capítulo 4 explorou a natureza dos processos cognitivos subjacentes ao efeito de facilitação das palavras durante o processamento de frases, isto é, se o efeito reflete um acesso antecipado às palavras esperadas ou uma facilitação no

processo de integração. Mais ainda, no caso de haver um acesso antecipado, procurou-se perceber se este ocorre de forma serial e gradativa ou de forma paralela. O conjunto de frases experimentais utilizado no estudo anterior foi também usado neste estudo e cada frase foi apresentada com a palavra mais esperada, a segunda palavra mais esperada ou uma palavra inesperada. A amplitude do componente de onda N400 foi sempre menos negativa para as palavras mais esperadas do que para as palavras inesperadas (entre 300-500ms), enquanto as segundas palavras mais esperadas apenas apresentaram uma menor amplitude do que as palavras inesperadas numa fase posterior (entre 400-500ms). Estes dados sugerem que o efeito de facilitação está associado à antecipação das palavras, uma vez que este emerge numa fase inicial do processamento das palavras; e mostram que a predição ocorre de forma serial e gradativa. Numa primeira fase, a antecipação é exclusiva para a palavra mais esperada, e só se a predição não se confirmar é que há antecipação de outras palavras também esperadas naquele contexto. Por sua vez, o processamento de palavras inesperadas parece envolver recursos adicionais numa fase posterior do processamento, como evidenciado pela maior amplitude do componente PNP para estas palavras comparativamente a palavras mais esperadas. Este efeito pode estar associado a um maior esforço de integração dessas palavras no contexto da frase.

O estudo de fMRI apresentado no Capítulo 5 investigou as bases neurais do efeito de facilitação com enfoque no papel de duas sub-regiões, uma mais anterior e outra mais posterior, do córtex frontal inferior esquerdo. Procurou-se esclarecer se a ativação desta área, especialmente a sua porção anterior, está associada a processos de integração semântica (Hagoort, 2016) ou ao acesso semântico das palavras (Badre & Wagner, 2007). Por outro lado, hipotetizou-se que a região posterior é recrutada durante a resolução da interferência causada pela ativação de múltiplas palavras. Observou-se maior ativação do córtex frontal inferior esquerdo durante a compreensão de frases completadas com

palavras inesperadas face a frases completadas com palavras esperadas. Uma análise restrita a esta região revelou uma diferença no padrão de ativação das porções anterior e posterior do córtex frontal inferior esquerdo. A sub-região anterior foi mais recrutada durante o processamento de frases completadas com palavras inesperadas comparativamente a frases completadas com palavras esperadas, apenas quando o contexto frásico era muito restritivo. A ativação da mesma região foi também observada durante o processamento de frases com palavras esperadas em que o contexto frásico era pouco restritivo relativamente a contextos frásicos muito restritivos. Os resultados mostram que o recrutamento desta região ocorre em condições de maior dificuldade no acesso às palavras, dado existir menos informação contextual congruente com as palavras-alvo. A sub-região posterior, além de apresentar resultados semelhantes aos da sub-região anterior, revelou maior ativação para frases completadas com palavras inesperadas em contextos muito restritivos comparativamente a contextos pouco restritivos. Estes dados sugerem que a porção posterior do córtex frontal inferior esquerdo é recrutada quando existe necessidade de resolver o conflito ou a interferência entre a palavra esperada ativada pelo contexto prévio e a palavra apresentada, inesperada naquele contexto. Mais ainda, o grau de ativação desta sub-região é modulado pelo grau de expectativa da palavra mais esperada.

Em suma, os resultados dos estudos apresentados nesta tese confirmam que o contexto frásico é usado ativamente durante a compreensão da frase para facilitar o acesso e integração de palavras. Este efeito foi encontrado para todas as palavras esperadas e parece estar principalmente associado à antecipação no acesso destas palavras. Esta antecipação é inicialmente exclusiva para as palavras mais esperadas, uma vez que a facilitação para palavras menos prováveis, isto é, as segundas mais esperadas, surge mais tardiamente, conforme demonstrado pelos resultados do Capítulo 4. Este efeito de

facilitação não foi significativamente afetado pelas características da tarefa nem por diferenças individuais entre participantes, logo os mecanismos preditivos parecem ocorrer de forma automática e generalizada (Capítulo 3). Por último, verificou-se que os mecanismos preditivos geram custos de processamento quando as previsões não são confirmadas, tal como evidenciado pelo aumento da ativação neural no córtex frontal inferior esquerdo para as palavras inesperadas (Capítulo 5). O processamento destas palavras requer a resolução do conflito/interferência entre a palavra esperada, erroneamente antecipada, e a palavra inesperada, especialmente nas frases com contextos mais restritivos.

As evidências encontradas nos estudos empíricos apoiam as propostas que argumentam que para a compreensão da linguagem se utilizam mecanismos preditivos, pelo menos em determinados contextos frásicos. Os dados mostram ainda que estes mecanismos ocorrem de forma serial e gradativa e que não são modulados pelas características das tarefas ou pelas capacidades dos leitores. Deste modo, os dados destes estudos dão um contributo importante para a elucidação dos processos envolvidos no processamento de palavras durante a compreensão de frases, e conseqüentemente têm implicações para o desenvolvimento dos modelos de compreensão da linguagem.

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1. INTRODUCTION

1.1. Overview

Sentence comprehension is a critical and unique aspect of human communication. Sentences are constructions with a set of specific syntactic structures and a vast, possibly an infinite set, of semantic combinations. The complex and dynamic interaction of the cognitive processes required to allow an efficient and rapid apprehension of the messages has puzzled researchers of several domains of cognitive science, such as linguistics, psychology, neuroscience and artificial intelligence.

The goal of this dissertation is to investigate the mechanisms underlying word integration during sentence comprehension, according to the sentence context and word' expectation. In a multilevel approach we explored the core processes of word integration, exploring several aspects of it, namely the nature and extension of those processes, the degree of automaticity of the processes engaged, the cost that might be entailed and their electrophysiological and neural correlates. To address these issues, evidences from behavioural, event-related potentials and brain imaging studies were combined.

Sentence comprehension begins with the translation of the physical inputs received – written text or speech – into word representations, and then those representations are combined to build a coherent meaning. Despite several cognitive processes being required to comprehend a sentence, namely accessing each word and integrating those words into the sentence context, it normally operates efficiently and rapidly. A key element to this seems to lie on the ability to use the context to facilitate the processing of the upcoming words. Namely, the context can be the prior discourse, visual cues in the environment, body language or the prior sentence message (DeLong, Urbach, & Kutas, 2005; Van Berkum, Brown, Zwitserlood, Kooijman, & Hagoort, 2005; Wicha,

Moreno, & Kutas, 2004). Yet, which processes lead to such facilitation effects, how those processes are implemented, and which factors may affect them are still unanswered questions.

1.2. The Role of Context and Words' Expectation in Word Integration

A vast body of research has reported that sentence context affects integration of an upcoming word (e.g., Fischler & Bloom, 1979; Schuberth & Eimas, 1977; Simpson, Peterson, Casteel, & Burgess, 1989; Stanovich & West, 1981). Specifically, a word is processed faster when it appears in a supportive context, that is constrained towards its meaning (e.g. “On a hot summer's day, many people go to the BEACHES”¹), than in a neutral context, that can be completed with a wide range of words (e.g., “The last word of this sentence is BEACHES”¹). These results are not merely explicable by lexical association effects, i.e., intralexical spreading activation, since the facilitation effect is greater when a pair of related words (e.g., ‘baby’ and ‘cry’) is embedded in a sentence than when it is presented in a non-sentence (e.g., “The presence of the stranger made the baby cry” and “The made the of presence stranger the baby cry”, respectively²). Moreover, the magnitude of the facilitation effect is unaffected by the lag between the pair of related words, the facilitation effect is similar in sentences where the pair of words (e.g., ‘crowd’ and ‘people’) are presented sequentially (e.g., “The auto accident drew a large crowd of people”²) and in sentences that present the pair of words (e.g., ‘chairs’ and ‘table’) interleaved by some other words (e.g., “John bought four chairs to go with his new table”²). If the effects were only explained by lexical spreading, increasing the lag between the pair of related words should lead to a reduced facilitation effect. Thus, the

¹ Examples from Schwanenflugel & LaCount (1988).

² Examples from Simpson, Peterson, Casteel, & Burgess (1989).

reliability of the effects of context rely on the fast capacity of building an interpretation of the sentence context, that then can be used to ease the processing of upcoming words (Simpson et al., 1989).

The degree of expectancy of each word in the sentence, which is usually assessed by a cloze procedure task (e.g., Bloom & Fischler, 1980; Pinheiro, Soares, Comesaña, Niznikiewicz, & Gonçalves, 2010; Taylor, 1953), modulates the magnitude of the facilitation effects. Several studies (e.g., Forster, 1981; Schubert, Spoehr, & Lane, 1981; Schwanenflugel & LaCount, 1988) have shown that the time to process a word is significantly shorter when that word is highly expected than when it is weakly expected (e.g., ‘beaches’ is highly expected in the sentence “On a hot summer's day, many people go to the”, whereas ‘schedule’ is weakly expected in the sentence “The college administrator made a change in the”). When the words presented are unexpected, even if those words are syntactically and semantically appropriate (e.g., ‘joke’ is an unexpected word in the sentence “The little girl refused to go to sleep until he told her a”³) the time to process them is higher than to process expected words, either highly or weakly expected. In some cases, the unexpected words can even lead to inhibitory effects, especially when those unexpected words appear in sentences that have an highly expected word (e.g., Federmeier, Wlotko, De Ochoa-Dewald, & Kutas, 2007; Ness & Meltzer-Asscher, 2018; Schwanenflugel & Shoben, 1985). There are at least two proposals for the mechanism that leads to these facilitation effects of expected words: integration and prediction.

³ Example from Wlotko & Federmeier (2012).

1.2.1. Integration Accounts

The integration view states that facilitatory effects for expected words in a sentence are a reflex of the greater match between the semantic properties of the context and target words (Schwanenflugel & Shoben, 1985; Traxler & Foss, 2000). When there is a good fit between the information conveyed by the sentence context and an upcoming word, that word is more easily integrated into the sentence and the creation of the sentence meaning evolves smoothly (Hagoort, 2006). Conversely, when the upcoming word is unexpected, even when it is a compatible completion of those sentences, they frequently disrupt the sentence interpretation (e.g., “On a hot summer's day, many people go to the MOVIES”, in this case the context may lead readers to build an idea that people would want to a place that benefits from a hot summer’s day, like a beach or a lake).

The older views of integration stipulated that this process was slow to begin, and occurred only after the meanings of all words had been completely retrieved (Schwanenflugel & Shoben, 1985; Swinney, 1979). Later accounts are more inclusive, proposing that the integration incorporates the early combination of semantic constraints built from the prior context, which eases the processing of upcoming words (e.g., Moss & Marslen-Wilson, 1993). However, even these theories do not include a role for prediction, as candidate words are held to be activated only when there is a perceptual input. The context only speeds and optimizes selection from the set of candidates that are consistent with the input received.

1.2.2. Prediction Proposals

The word prediction, as its origins in Latin allude to – pre (before or in front of) plus dicere (to speak) – means to declare what will happen in the future (Van Petten & Luka, 2012). Several human behaviours have a predictive quality, that rapidly improve

the outcome of the actions (e.g., predicting a trajectory of a ball to catch it). In the language domain, prediction is defined as the ability to anticipate an upcoming input (e.g., word), that may help the person to process language stimuli more rapidly and efficiently (Kuperberg & Jaeger, 2016). Thus, some authors have proposed that the facilitatory effects observed for the expectable word during sentence comprehension are driven by the pre-activation of those words, that occurs before they appear (e.g., Kutas & Federmeier, 2000; Van Petten & Luka, 2012).

In its seminal proposal, prediction was conceptualized as an explicit, deterministic and all-or-nothing process (Forster, 1981; Posner & Snyder, 1975). Yet, more recent accounts view it as a more implicit process that can occur unconsciously (Kutas & Federmeier, 2000). There are several questions that remain under debate regarding the predictive mechanism. Does prediction occur continuously during sentence comprehension or only under certain circumstances (e.g., only in sentences that have a highly expected word)? Is prediction exclusively generated for a specific candidate or are multiple expectable candidates anticipated? Is there any cost associated with a disconfirmed prediction (e.g., when the sentence is completed with an unexpected word)? If so, what are the mechanisms invoked – inhibition and/or re-interpretation?

The experimental studies developed in this thesis aims to answer to these questions. Namely, in the studies of chapter 3 and 4 we contrasted the processing of the most expected word and of the second-best candidate, the second most expected word in a sentence, to examine the reach of the predictive mechanisms. To our knowledge, these were the first studies to present a probable candidate without being the most frequent response in the cloze procedure task. In chapter 5, besides the word expectancy manipulation, the context constraint was also manipulated, which allowed to explore the circumstances that give rise to the predictive mechanisms. This study makes an important

contribution to the neuroimaging literature since is the first to manipulate both dimensions. Moreover, in chapter 4 and 5 we explore if there are specific neural correlates associated with the processing of unexpected words and which processes they are indexing.

1.3. Experimental Methodologies

1.3.1. Behavioural Paradigms

The role of sentence context on word integration difficulty has been extensively explored using behavioural paradigms. The three tasks that are most commonly used are lexical decision (e.g., Fischler & Bloom, 1979; Forster, 1981; Schubert & Eimas, 1977; Schwanenflugel & LaCount, 1988; Tabossi, 1988), naming (e.g., Stanovich & West, 1983; Stanovich & West, 1981; West & Stanovich, 1978) and self-paced reading (e.g., Calvo & Castillo, 1996; Hintz, Meyer, & Huettig, 2016). In lexical decision tasks, participants are exposed to words or non-words and they have to decide as quickly as possible if that stimulus is a word or not, normally using two keys of a keyboard or a response box. When the researchers are studying the impact of sentence context on the integration of words normally the sentence context is initially presented in its entirety, either visually or auditorily, and then, in a separate display, the word or non-word is presented. There are two measures that are normally reported – the accuracy and the response time of the participant's responses. The most relevant measure for this type of study is the response time to the target words. Lexical decision is a versatile and robust paradigm, yet it is a task that requires more stimuli (usually, twice as many stimuli, to match the number of words and non-words) and, consequently, more time than other behavioural paradigms. Moreover, it is a less ecological task, as it is an uncommon task

for participants to evaluate the lexicality of a stimulus, and it requires an attention switch, from reading/listening to making a binary decision (West & Stanovich, 1982).

The naming paradigm is a more natural task for participants, since in this task they are asked to read aloud a sentence and/or a specific word. In many of those studies the participant sees the context initially, which can be read aloud or read silently, and then a target word appears and they have to name it aloud as rapidly as possible (e.g., West & Stanovich, 1981; West & Stanovich, 1978). The critical measure is the time that the participant takes to read aloud the target words. The major disadvantage of this paradigm is that it requires a processing switch from comprehension to production. This implies that the measure captures not only the access of words but also the production abilities.

In both lexical decision and naming paradigms the target words are usually presented separately from the remaining context, which might increase the probability that participants adopt strategic processing that might not be representative of the cognitive processes that are attempted to be characterized. Additionally, as most of the time the target words are the last words being presented for each sentence, the measure being reported might be affected by sentence wrap-up effects (Just & Carpenter, 1980; Rayner, Kambe, & Duffy, 2000). Both limitations are usually avoided in the self-paced reading paradigm, as in this task all the words of the sentence are presented in the same format and the target words are usually presented at least a few words prior to the end of the sentence. In this paradigm, adopted in the empirical study presented in Chapter 3, sentences are usually presented word-by-word at the participant's rate, since only when he/she presses a button does the next word appear. The key measures are the reading time of the target word and of the subsequent words, due to the spill-over effects (Morris, 1994). It should be noted that this paradigm also presents some disadvantages: it might lead to unnatural reading and repeatedly pressing a button while reading may induce task-

specific effects, such as longer reading times and delayed processing effects that spill over into the next word (Jegerski, 2014; Morris, 1994). Nevertheless, it is a robust paradigm, commonly used in psycholinguistic studies, that does not imply attention or cognitive switch, and that give us a more continuous measure of sentence processing, since it measures the reading times of each word.

1.3.2. Event-Related Potentials

The event-related potential (ERP) technique, used in the empirical study of Chapter 4, provides a highly informative temporal perspective on brain processing. It measures the voltage fluctuations in the ongoing electroencephalogram (EEG) that are time-locked to an event. The measurement of the electrical activity is obtained from electrodes placed on the scalp. The changes in scalp-recorded voltage that give rise to the ERP waveforms reflect the summation of postsynaptic potentials that appear simultaneously in a large number of cortical cells (Luck, 2014; Luck & Kappenman, 2011).

ERPs are well-suited to investigate language processing mainly for two reasons. First, they can provide an online measure of the processing of stimuli even when there is no behavioural response. In studies that explore the role of sentence context it is useful to measure the processing of specific words at the exact time the word is presented. In contrast with behavioural measures, that require an overt response, there is no need for the participants to perform a task, other than reading or listening sentences. Therefore, data is not affected by a meta-linguistic task, which people usually do not perform during natural comprehension. Secondly, this technique, besides providing a continuous measure of processing, has a high temporal resolution that helps to determine which stages of processing are affected by a given experimental manipulation (Luck, 2014). In language comprehension there is a vast literature using this analysis since it allows for the

investigation of the timing of earlier processes such as orthographic, phonological and semantic access (e.g., Comesaña et al., 2012; Hoshino, Midgley, & Grainger, 2011) and of later stages processes such as word integration (e.g., Zhu et al., 2012) or sentence re-interpretation (e.g., Brothers, Wlotko, Warnke, Kuperberg, & Watkins, 2020).

The two ERP components more frequently reported on studies exploring the impact of the context on the processing of words are the N400 and post-N400 positivity (Kutas & Federmeier, 2011; Thornhill & Van Petten, 2012).

1.3.2.1. N400 in Sentence Comprehension Studies

The best studied language-related ERP component is the N400, first reported by Kutas and Hillyard (1980). It was labelled as N400 since it is a relative negativity peaking around 400ms, though the negative deflection of the ERP usually starts 200-300ms after the critical word is presented. The N400 component is usually larger over central and parietal electrode sites, with a slightly larger amplitude over the right hemisphere than over the left hemisphere (Kutas & Federmeier, 2011; Lau, Phillips, & Poeppel, 2008). The initial studies demonstrated that the N400 was observed in response to violations of semantic expectancies. For example, a larger N400 was elicited by the last word of the sentence “I take my coffee with cream and dog” compared to when the last word of that sentence was “sugar” (Kutas & Hillyard, 1980). Crucially, many studies have shown that the N400 is also sensitive to the degree of expectation of the words (Federmeier et al, 2007; Kutas & Hillyard, 1984). Results have revealed that the N400 has a greater amplitude when the words are less expected, yet semantically appropriate, than when they are strongly expected (e.g., “honey” in the sentence context “I like my coffee with cream and”, where “sugar” is the most expected completion).

In the last thirty years, with the rapid growth of studies, several theories have been presented for the processes underlying N400 effects. Some of those were framed at a

functional level, trying to map this component onto specific cognitive operation(s), such as semantic memory access (e.g., Federmeier & Kutas, 1999; Kutas & Federmeier, 2000) or semantic unification (e.g., Hagoort, Baggio, & Willems, 2009; Hagoort, Hald, Bastiaansen, & Petersson, 2004). These functional views are mainly based on the assumption that during sentence comprehension, which involves a feedforward series of processes, words are initially analysed at the perceptual level, then as a linguistic input (lexical processing), which culminates in word recognition. When the semantic information about a word becomes available, it can then be integrated into the current mental model of the unfolding sentence (Kutas & Federmeier, 2011). The views that associate the N400 to semantic memory access relate this component with relatively early processes which occur during the retrieval of word representations (Kutas & Federmeier, 2000). In contrast, the views that link the N400 to word unification, i.e., to the integration of semantic information of the accessed word with the sentence meaning, posits the N400 occurs relatively late in the processing stream (Hagoort et al., 2009). Most authors support that the N400 reflects mandatory processes in sentence comprehension, either by the eased retrieval or by the less demanding integration, yet it is still unclear which or to what extent those specific processes modulate this ERP component.

1.3.2.2. Post-N400 Positivity

In recent years, an increasing number of sentence comprehension studies have reported an enhanced positivity normally at the frontal electrodes, usually found between 600 to 900ms after target word onset. This component – Post-N400 Positivity (PNP) – has been reported for the first time in a study of Kutas in 1993. The ERP analysis revealed that there was an enhanced positivity when processing unexpected words compared to expected words when those words were embedded in high constraint sentences. The effect was particularly enhanced when unexpected words were unrelated with the expected

words. The author suggested that this component might index inhibition of a predicted word that did not appear (Kutas, 1993), facilitating the integration of the unexpected word (Ness & Meltzer-Asscher, 2018; Thornhill & Van Petten, 2012). Alternatively, some authors have proposed that PNP reflects a post-lexical discourse revision mechanism, that is triggered when readers face an unexpected word that requires a partial revision of the context for a coherent interpretation (Brothers, Swaab, & Traxler, 2015).

Besides being affected by the semantic relationship, namely the lack of it, between the unexpected and expected words (DeLong & Kutas, 2020; Kutas, 1993), the PNP seems to also be sensitive to the sentence's constraint (Brothers et al., 2020; Federmeier et al., 2007). Some studies have found that the PNP was elicited by unexpected words that appeared in sentences that have a high semantic constraint, whereas there was no effect when unexpected words were embedded in sentences with a low semantic constraint (Federmeier et al., 2007). Yet, the PNP effects are not consistently reported in EEG studies of sentence comprehension with these manipulations. In a literature review, van Petten and Luka (2012), examined 13 studies that have tested 19 contrasts between unexpected and expected words. They noticed that the PNP component was found in a little more than a half of the contrasts. Moreover, some inconsistencies have been reported, namely some studies found PNP only in high constraint sentences (Federmeier et al., 2007), whereas others showed a PNP effect for unexpected words in both high and low constraint sentences (Thornhill & Van Petten, 2012). Thus, the conditions that trigger the PNP and the functional nature of this late positivity to unexpected words are not well understood.

1.3.3. Functional Magnetic Resonance Imaging

In Chapter 5 of this thesis, functional magnetic resonance imaging (fMRI) was used to explore the brain regions associated with integration of words during sentence

comprehension. fMRI is a non-invasive technique that has a good spatial resolution, therefore is a commonly used method for mapping the functional architecture of the human brain (Kemmerer, 2014). During an fMRI experiment, a series of brain images are acquired while the participant performs a task. Changes in the measured signal allow researchers to make inferences regarding the task-related activations in the brain. This is accomplished by detecting changes in blood oxygenation level dependent (BOLD) signal. The assumption is that when a certain brain area is particularly active (e.g., during sentence reading), it consumes more oxygen and, to meet that increased demand, blood flow increases to that active area. Therefore, fMRI is based on increases in the blood-oxygen level in discrete parts of the brain (Rodden & Stemmer, 2008).

1.3.3.1. Neural Mechanism Underlying Word Integration During Sentence Comprehension

Anatomical studies of language impaired patients and neuroimaging studies with normal readers have found that the cognitive processes involved in sentence comprehension recruit several areas across the brain. In the frontal lobe, the regions that are more commonly engaged are the left inferior frontal gyrus (Cardillo, Aydelott, Matthews, & Devlin, 2004; Friederici, Meyer, & Von Cramon, 2000; Kiehl, Laurens, & Petten, 2002; Kuperberg et al., 2003; Ni et al., 2000; Xu, Kemeny, Park, Frattali, & Braun, 2005), middle frontal gyrus (Kuperberg et al., 2003; Ni et al., 2000) and left superior frontal cortex (Bulut, Hung, Tzeng, & Wu, 2017; Kuperberg et al., 2003). Several regions of the temporal lobe are also frequently activated when processing semantically correct sentences, such as middle temporal gyrus (Cardillo et al., 2004; Kuperberg et al., 2003; Ni et al., 2000; Stowe et al., 1998) and superior temporal gyrus (Friederici, Rüschemeyer, Hahne, & Fiebach, 2003; Kuperberg et al., 2003; Ni et al., 2000). Additionally, the

angular (Humphries, Binder, Medler, & Liebenthal, 2007; Newman, Pancheva, Ozawa, Neville, & Ullman, 2001) and fusiform gyrus (Cardillo et al., 2004; Kiehl et al., 2002; Kuperberg et al., 2003; Zemleni, Renken, Hoeks, Hoogduin, & Stowe, 2007) are also associated with processes related to sentence comprehension.

Within this fronto-temporal language network, the left inferior frontal gyrus (LIFG) plays a critical role when sentences are completed with unexpected words (Baumgaertner, Weiller, & Büchel, 2002; Cardillo et al., 2004; Huang et al., 2012; Kuperberg et al., 2000; Zhu et al., 2012). Some authors have proposed that this region is linked to the semantic unification of words during sentence comprehension, thus sentences that impose greater demands for unification, such as the ones with unexpected words, lead to an increased activation of LIFG (Hagoort, 2006; Zhu et al., 2012). Alternatively, the conflict resolution framework (Novick, Kan, Trueswell, & Thompson-Schill, 2009; Novick, Trueswell, & Thompson-Schill, 2005) has proposed that the LIFG is recruited when multiple representations are active, but require selection of only one of them. Thus, increased LIFG activation for sentences completed with an unexpected word may be due either to monitoring the conflict of two competing candidates or to the resolution of the conflict.

The role of LIFG during sentence comprehension was analysed in the study of Chapter 5 – particularly we investigated which cognitive processes, semantic unification or conflict monitoring/resolution, trigger the enhanced activation of this brain region during the retrieval and integration of unexpected words.

1.4. Thesis Outline

The next chapters will present the work developed to explore the processes involved in word integration during sentence comprehension.

Chapter 2 presents the validation of a large set of sentence completion norms for European Portuguese sentences. They were developed to provide material for the experiments of the following chapters, since there was no large dataset of European Portuguese sentence norms validated in the adult population. The norms were validated in two experiments, using distinct paradigms. The first experiment used the classical single-production paradigm, whereas the second experiment applied the multiple-production paradigm.

Chapter 3 comprises a behavioural study using the self-paced moving window paradigm, designed to examine the nature of the cognitive processes underlying expectancy effects during sentence comprehension. Particularly, we explored the extension of the expectancy effects, to find if they are exclusive for the most expected words or if they expand to all expected words. Moreover, we analysed to what extent the processes underlying those facilitatory effects were affected by task demands and/or by participants' reading and working memory abilities.

Chapter 4 investigates the electrophysiological bases of word processing. The use of the ERP methodology provides a better grasp of the timing of the cognitive processes that are involved in word retrieval and/or integration during sentence comprehension, overcoming some limitations of the behavioural task presented in Chapter 3. Moreover, we explore if the processing of unexpected words requires an additional step in the processing, indexed by the arising of a late positivity component, and to which process it might be associated – inhibition or reinterpretation.

Chapter 5 explores the neural underpinnings of the expectancy effect focusing on the role of subregions of the LIFG during sentence comprehension. We aimed to clarify if the recruitment of this area is associated with semantic integration operations, particularly the anterior region of LIFG, or if it reflects the access and retrieval of words,

whereas the posterior LIFG reflects the cognitive demands associated with resolution of conflict between multiple active candidates.

In the final chapter, the main results across experimental studies are summarized and discussed. We debate the impact of sentence context and word's expectancy in word retrieval and integration, the functional dissociation within the LIFG and the cognitive mechanisms underlying the processing of unexpected words. We also examine how the predictive mechanisms are implemented, namely the extent of word pre-activation, the flexibility of using these mechanisms to optimize reading and the implications of the findings for the language comprehension models. Lastly, we present some ideas for future research.

2. COMPLETION NORMS FOR EUROPEAN PORTUGUESE SENTENCES

2.1. Introduction

During language comprehension, people frequently use the current sentential context to anticipate upcoming words. Such mechanisms can facilitate comprehension by helping to determine the appropriate response, enabling turn-taking in a conversation and contribute to our appreciation of humour (e.g., Coulson & Kutas, 2001; De Ruiter, Mitterer, & Enfield, 2006; Federmeier, 2007). A vast number of studies have manipulated word expectancy to unravel the neurocognitive mechanisms underpinning word processing during sentence comprehension by measuring performance, eye-movements, electrophysiological and hemodynamic responses (e.g., Hagoort et al., 2004; Kutas & Hillyard, 1980; Schwanenflugel & Shoben, 1985; Staub, 2011; Van Berkum et al, 2005). They have shown that in reading the expectancy of a word modulates sentence comprehension, the amount of attention allocated to that word, and the underlying electrophysiological and neural activation patterns (Kutas & Federmeier, 2011, for revision). Research with clinical populations have also examined the effects of word expectation and sentence constraint on various disorders including aphasia (Berndt, Mitchum, Haendiges, & Sandson, 1997), Alzheimer's (Nebes & Brady, 1991), schizophrenia (Kircher et al., 2001) and autism (Pijnacker, Geurts, van Lambalgen, Buitelaar, & Hagoort, 2010).

Critically, studies investigating the influence of context or word expectancy rely on stimuli that have been pre-normed for various psycholinguistic properties (Block & Baldwin, 2010). A large sample of normative data is essential for selecting experimental stimuli that can be manipulated for the critical variables while controlling for factors that should not differ between conditions (e.g., number words, syntactic structure). In such

datasets, a word's degree of expectancy within a given sentential context is often operationalized in terms of cloze probability (Taylor, 1953). This measure corresponds to the proportion of participants that provide the same word in completing a sentential fragment. This cloze task has become one of the most widely used laboratory tasks to measure the contextual constraints of sentences and words' expectancy. Normative sentence completion data are currently available for English (e.g., Arcuri, Rabe-Hesketh, Morris, & McGuire, 2001; Block & Baldwin, 2010; Bloom & Fischler, 1980; Schwanenflugel, 1986), French (Robichon, Besson, & Faïta, 1996), Spanish (McDonald & Tamariz, 2002) and European Portuguese (Pinheiro et al., 2010). The Portuguese dataset is composed of only seventy-three contexts collected in the child and adolescent population. Thus, to our knowledge, there is no available large dataset of sentence completion norms from the adult population in European Portuguese.

In the two experiments reported here, we aimed to build a sentence completion norm database composed by a large and diversified set of sentences tested in a young and healthy adult sample, as they are the population most commonly used to study language processes in non-clinical research. We used the classical paper-and-pencil protocol in which participants were asked to provide the single word they thought would best complete each sentence (Experiment 1) and a computer-based task where participants were asked to indicate three words that can be used to complete each sentence frame (Experiment 2).

2.1.1. Cloze Probability Measure

The published completion norms are composed of a set of sentence frames and the words that participants provide to complete those sentential contexts. Usually, the fragments of a sentence are presented on a written form and participants are instructed to complete it with the first word that comes to their mind (Block & Baldwin, 2010; Bloom

& Fischler, 1980; Taylor, 1953). The most important measure computed is the cloze probability of each word, that is, the proportion of valid responses that used that specific word to complete the sentence fragment. The cloze probability of the most expected word frequently defines the level of constraint of the sentence context. Sentential fragments that have a word that almost all participants use to complete the context are defined as high constraint contexts, as they are strongly biased towards a specific candidate. Conversely, sentential fragments that have a most expected word with a low cloze probability and have a larger number of different words also used to complete the sentences' frame are considered to have a low constraining context. Usually, sentential fragments that are completed with a specific word at least by two thirds of the participants are classified as sentences with high constraint contexts, whereas when less than half of the participants use the same word to complete the sentential fragment the sentences are defined as having low constraint contexts.

To the best of our knowledge, for European Portuguese there is only one normative dataset validated (Pinheiro et al., 2010). As mentioned above, those norms were collected only with children and adolescents, thus there are no available norms for the adult population. Moreover, in this dataset the number of sentence frames was very limited (only 73), all had the same syntactic structure (subject and direct verb in a present tense) and were composed by 4 words (e.g., "The cook lights the"). These restrictions constrain stimuli selection. In an electrophysiological study, for instance, at least 30 stimuli are required per condition. Also, the fact that the sentences are composed by five words differs from other normative sentence completion datasets (in other languages), which normally have between 5 to 10 words to optimize the influence of the context (Aborn, Rubenstein, & Sterling, 1959; Block & Baldwin, 2010).

2.1.2. Paradigms of Cloze Procedure

In the classical cloze paradigm, sentence frames are presented in booklets that contain a predefined number presented in the same order to a group of participants (Bloom & Fischler, 1980; Taylor, 1953). There is no time constraint for each response and no other measure than the actual word written by each participant is registered. Yet, the time that participants take to select a word may be a relevant indicator of the sentence frame constraint. In a more recent norming study, participants were instructed to produce their response aloud (Staub, Grant, Astheimer, & Cohen, 2015). The sentence fragments were presented word-by-word, for 300ms each, and at the completion of the fragment a horizontal line appeared, serving as a prompt for participants to provide their response. There was a limited time of 3000ms during which participants had to say a word aloud. The results demonstrated that the words with high cloze probability were produced faster than words with low cloze probability.

Another version of the cloze procedure is the multiple-production paradigm. Unlike the standard cloze procedure, for which only a single response is requested for each sentence fragment, participants provide up to three completion words for each fragment (McDonald & Tamariz, 2002; Schwanenflugel, 1986). This method overcomes the implicit assumption that a single response is prominent, when in fact there might be more than one word that readily comes to mind to finish the sentence.

To date, no direct comparisons have been made between the different protocols used. It remains unknown if the measures of cloze probability obtained in single- and multiple-production paradigms differ and how response times may inform such measures.

2.1.3. Type-Token Ratio and the Proportion of Idiosyncratic Responses

Besides cloze probability, other measures have been employed, although to a lesser extent, to evaluate sentence completion, namely, the type-token ratio and the proportion of idiosyncratic responses (McDonald & Tamariz, 2002; Schwanenflugel, 1986; Staub et al., 2015). The type-token ratio, also defined as the probability of modal response, is estimated for each given sentence fragment by the number of different words, or types, divided by the total number of completions, or tokens, generated. This measure reflects the contextual constraint of the sentential fragment, as it is sensitive to the variety of completion words that are supplied by the participants (McDonald & Tamariz, 2002; Schwanenflugel, 1986). The proportion of idiosyncratic responses is calculated for each sentence fragment by dividing the number of words that were provided by only one participant by the total number of completions (Pinheiro et al., 2010; Schwanenflugel, 1986). This measure is also related with contextual constraint, as the low constraint context is more open and likely to be completed with distinct and unique responses across participants.

Previous work has demonstrated that these two measures are correlated with the cloze probability of the most frequently used word to complete the sentence fragment. The type-token ratio is negatively correlated with cloze probability, as the more biased the sentence is towards a specific candidate, the fewer alternative words are used to complete that sentence (McDonald & Tamariz, 2002). Similarly, idiosyncratic responses negatively correlate with cloze probability, indicating that more constraining sentence fragments are completed with less unique words (Schwanenflugel, 1986).

2.1.4. Present Study

The main purpose of the present study is to create a large set of sentence completion norms for European Portuguese validated in the adult population. In total, 807 sentence fragments were tested that intuitively varied in the degree to which they were constrained to a specific final word. The fragments differed in their syntactic structure and ranged from 6 to 12 words. For each sentence fragment, we calculated the cloze probability of each word used to complete the sentential context, the type-token ratio and the proportion of idiosyncratic responses.

The sentences were split and tested in two experiments. Experiment 1 employed the classical single-production paradigm, with data collected in paper-and-pencil. Experiment 2 consisted in the multiple-production paradigm and data were collected through a computer-based task. The time that participants took to write down their responses was registered. Two methods were used to calculate the sentence completion measures, one only considering the first response of each participant and the other considering the total of valid responses of each participant (maximum of three per sentence fragment). These scores allowed to examine the similarities and discrepancies of using single and multiple production paradigms. Additionally, to understand if the results are consistent across protocols, the scores obtained in the two experiments were compared, since 62 sentences were common to both.

2.2. Experiment 1

2.2.1. Methods

2.2.1.1. Participants

One hundred and fifty-five participants (mean age = 19.94, $SD = 5.81$) took part in the experiment. Two participants were excluded since their native language was not

European Portuguese, leaving 153 participants. All participants were students from Universidade de Lisboa. They provided informed consent to the experimental procedure, which was approved by ethics committee of Faculdade de Psicologia da Universidade de Lisboa.

2.2.1.2. Materials

A total of 268 sentence fragments were created by the experimenters and designed to: (1) be of varying sentence constraints, (2) yield nouns as the most likely sentence completion, and (3) have a range of syntactic structures (however, no formal manipulation of syntactic complexity was attempted). Each sentence fragment contained between six and twelve words ($M = 8.54$, $SD = 1.30$), since context reaches its maximum effect between 5 and 10 words (Aborn et al., 1959; Block & Baldwin, 2010) and the majority of them ended with determiner (e.g., articles) or preposition (85% of the fragments), which constrained the grammatical gender and/or number of the supplied completion word and increased the likelihood of completing it with a noun.

The materials were divided across five booklets, each containing 53 or 54 sentence fragments. The task instructions were presented at the beginning of the booklet, indicating that participants should read attentively each sentence fragment and write down the word that first occurred to them as a likely end of that sentence. It was emphasized that they should only use one word. The order of the sentence fragments was pseudorandomized to reduce the potential effects of lexical or semantic association between a sentence and the following one.

2.2.1.3. Procedure

All participants were tested in the classroom and took on average 15 minutes to complete the booklet they received. Each participant completed only one booklet.

2.2.1.4. Coding of Responses

A coder inserted the written responses in an Excel database. All legible responses (n=8135) were registered in the dataset correcting for spelling errors. From those responses, 34 were removed, since they were semantically or syntactically invalid words in that sentence context.

If participants responded with more than one word and these were not a compound word (e.g., “ar condicionado”), in most cases the first word was considered (e.g., “vinho tinto” was converted to “vinho” in response to the sentence “Para fazer um brinde pediu uma garrafa de”). In other cases, when the first word was a pronoun or an adjective, the noun was considered the valid response (e.g., “sua resposta” was converted to “resposta” in the sentence “A professora pediu-lhe para reescrever a”). In cases where there were both plural and singular forms of the same response across participants, these were collapsed to the more common form (e.g., “pizzas” in response to “Quando estive em Itália fartou-se de comer”). The same rule was applied when there were diminutives of words (e.g., “beijinho” was converted to “beijo” in response to “Antes de ir dormir o filho deu-lhe um”). In total there were only 36 cases in which the coder had to apply one of these rules, which is the usual practice in coding cloze responses (e.g., Staub et al., 2015). Blanks and illegible responses (0.15%) were excluded from the dataset and the analysis.

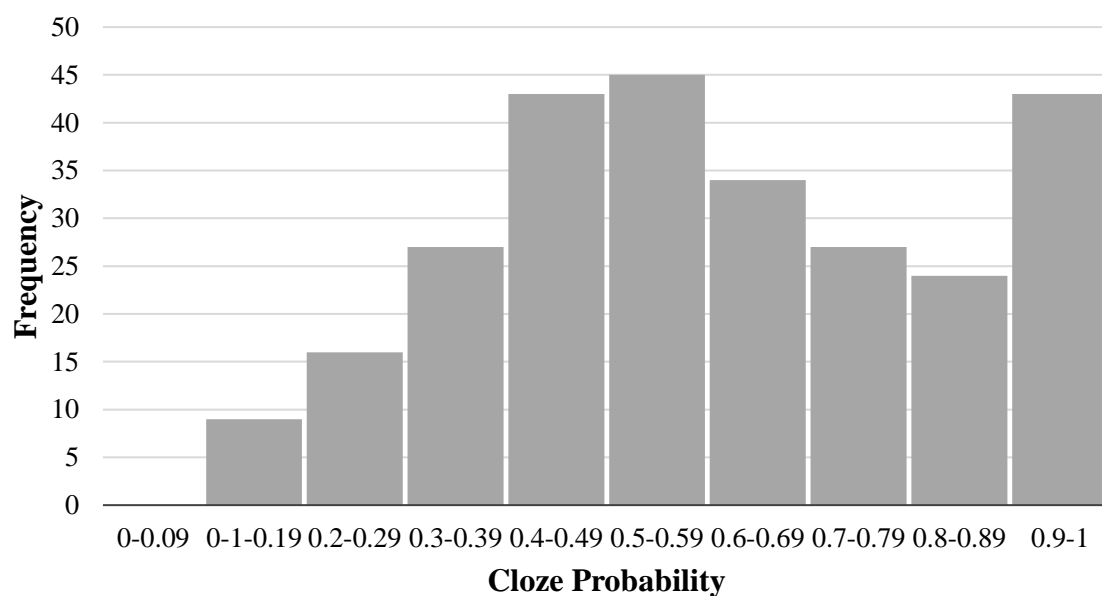
2.2.2. Results

For each sentence fragment at least 28 valid responses were given ($M = 30.23$, $SD = .76$). Cloze probability was calculated by dividing the number of participants listing each response by the total number of valid responses to each item. The cloze probability of the most frequent response ranged from .13 to 1 ($M = .60$, $SD = .23$). The frequency distribution of the cloze probabilities obtained is displayed in Figure 1. The 268 sentence

fragments are listed in Table 1 of Appendix A in descending order of cloze probability of the most frequent response. For each sentence frame, the sentence completions are listed in order of decreasing production probability, with each completion followed by the probability of that response.

Figure 1

Distribution of Cloze Probabilities of Experiment 1



For a more fine-grained analysis of the effect of context in participants' responses, two additional measures were computed for each sentential fragment: the type-token ratio and the proportion of idiosyncratic responses. The type-token ratio was estimated by dividing the number of different words generated by the total number of completions. The proportion of idiosyncratic responses was calculated by dividing the number of valid responses produced by only one participant by the total number of completions for that specific sentence context (see Table 1 for descriptive statistics). Table 2 displays the correlations between cloze probability and context measures. The type-token ratio ($M =$

.22, $SD = .13$) was significantly negatively correlated with cloze probability ($r = -.79, p < .001$). The more strongly a word is expected in that frame, the narrower the range of completion words supplied. The proportion of idiosyncratic responses ($M = .11, SD = .09$) was also negatively correlated with cloze probability ($r = -.58, p < .001$), indicating that the more strongly constrained the sentence is towards a specific candidate, the smaller is the number of idiosyncratic responses.

Table 1

Descriptive Statistics for Cloze Probability, Type-Token Ratio and Proportion of Idiosyncratic Responses

	<i>M</i>	<i>SD</i>	Range
Cloze probability ^a	.60	.23	.13 – 1
Type-token ratio	.22	.13	.03 – .65
Idiosyncratic responses ^b	.11	.09	0 – .45

Note. *M* = mean; *SD* = standard deviation.

^a Cloze probability of the most expected word. ^b Proportion of idiosyncratic responses.

Table 2

Correlation Matrix Between Measures Computed from the Distribution of Responses and Stimulus and Responses Characteristics

Variable	Cloze Probability ^a	Type-Token Ratio	Idiosyncratic Responses ^b	Sentence Length
Cloze probability ^a	1			
Type-token ratio	-.79***	1		
Idiosyncratic responses ^b	-.58***	.91***	1	
Sentence length	.18*	-.12	-.09	1

^a Cloze probability of the most expected word. ^b Proportion of idiosyncratic responses.

* $p < .05$. *** $p < .001$

We also explored if there were associations between the response distribution measures and the sentence length. Sentence length was positively correlated with cloze probability ($r = .18, p = .016$), revealing that the longer the sentence is the more strongly it is biased towards a specific word. Contrastingly, sentence length did not show a significant correlation with type-token ratio or proportion of idiosyncratic responses (see Table 2).

2.3. Experiment 2

2.3.1. Methods

2.3.1.1. Participants

One hundred and twenty-four participants (mean age = 19.03, $SD = 3.06$) took part in the experiment (none of which participated in Experiment 1). They were all university students at Faculdade de Psicologia at Universidade de Lisboa and received a course credit compensation for their participation. They provided informed consent to the experimental procedure, which was approved by ethics committee of Faculdade de Psicologia da Universidade de Lisboa.

2.3.1.2. Materials

To increase the number of sentences with completion norms, a set of 539 new sentence fragments was created in a similar fashion to the ones used in Experiment 1. Additionally, to directly compare both methods of data collection, we retested 62 sentence fragments from Experiment 1. In total 601 sentence fragments were tested. Each sentence fragment contained between five and twelve words ($M = 8.43, SD = 1.45$) and the majority of them ended with a determiner or preposition (87% of the fragments),

which constrained the grammatical gender and/or number of the supplied completion word.

2.3.1.3. Procedure

The experiment was implemented in E-Prime (E.Prime 2.0, Psychology Software Tools, 2006), running on Windows PC computers with CRT monitors. Participants were tested in group sessions in a quiet experimental testing room. Each trial started with the presentation of a fixation cross (500 ms) in the centre of the screen. Then, the sentence fragment and the response box appeared on the screen. After typing the first word to complete the sentence, participants pressed the ‘Enter’ key and a new response box appeared. The same procedure for the second word, then after the third word there was an inter-trial interval of 300 ms. Each participant was presented with a set of sentence fragments, ranging from 79 to 138 fragments, according to the time available to complete the task. Items were presented in random order.

In the beginning of the experiment, participants received instructions indicating that they should read attentively each sentence fragment and write down three words that were likely completions of those sentences. If participants could not generate three possible candidates, they were instructed to type ‘NS’ (“não sei”).

2.3.1.4. Coding of Responses

A coder created an Excel database with all the participants’ responses. All legible responses (n=27456) were registered in the dataset after correcting for spelling errors. One hundred and thirty-seven responses (0.53%) were excluded, since words induced a semantic or syntactic violation of the sentence context. The same criteria used in Experiment 1 – for responses with more than one word, and for sentences in which the responses contained both singular and plural or normal and diminutive forms of the word

– were applied in this experiment. In total, there were only 125 cases in which the researcher had to rectify the participant’s responses.

2.3.2. Results

2.3.2.1. Cloze Probability and Context Constraint

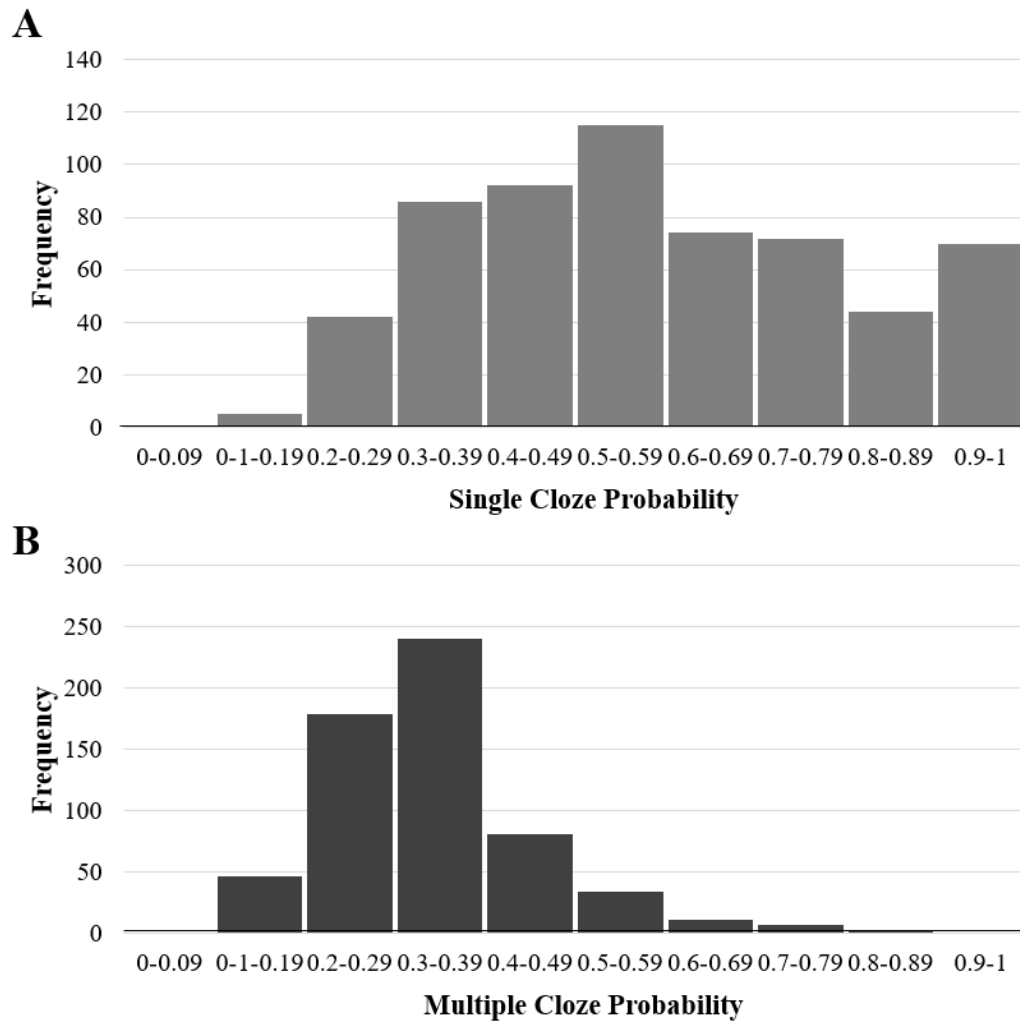
Of the 601 experimental items, one was eliminated due to a high number of semantically invalid answers (29%). The mean number of participants that answered to each sentence frame was 19.70 ($SD = 5.35$; range: 10 to 46). Participants produced an average of 2.34 words per sentence frame ($SD = 0.40$; range: 1 to 3). Cloze probability was computed in two different ways: (1) single cloze probability – dividing the number of participants listing each response by the total number of valid responses to each item, considering only the first word produced; (2) multiple cloze probability – dividing the number of participants listing each response by the total number of valid responses to each item considering all the valid completions. The 600 fragments are listed in Table 2 of Appendix A in descending order of single cloze probability of the most frequent response. Table 3 of Appendix A lists the sentence fragments in descending order of multiple cloze probability. In both cases, each completion is followed by the probability of that response.

The single cloze probability of the most frequent response ranged from .11 to 1 ($M = .58$, $SD = .21$), while the multiple cloze probability of the most frequent word ranged from .11 to .87 ($M = .34$, $SD = .11$). The distributions are illustrated in Figure 2. There was a significant positive correlation between both cloze probability measures (see Figure 3 and Table 4). Importantly, for 88% of the sentence fragments the most frequent response was the same considering only the first response and all the valid responses independently of being the first, second or third response. When the most expected response was

different in the multiple analysis, in most of the cases (in 50 of the 72 cases) the most expected word in the single cloze probability analysis was the second most expected word when considering all valid responses.

Figure 2

Distribution of Cloze Probabilities of Experiment 2



The type-token ratio and the proportion of idiosyncratic responses (see Table 3) were also computed considering only the first completions of the sentence fragments (single TTR and single IDIO) and counting the three valid sentence completions (multiple TTR and multiple IDIO). In both cases, we found a positive moderate to strong correlation

between the single and multiple completions (TTR: $r = .51, p < .01$; IDIO; $r = .41, p < .01$).

Table 3

Descriptive Statistics for Cloze Probability, Type-Token Ratio and Proportion of Idiosyncratic Responses for Single and Multiple Measures

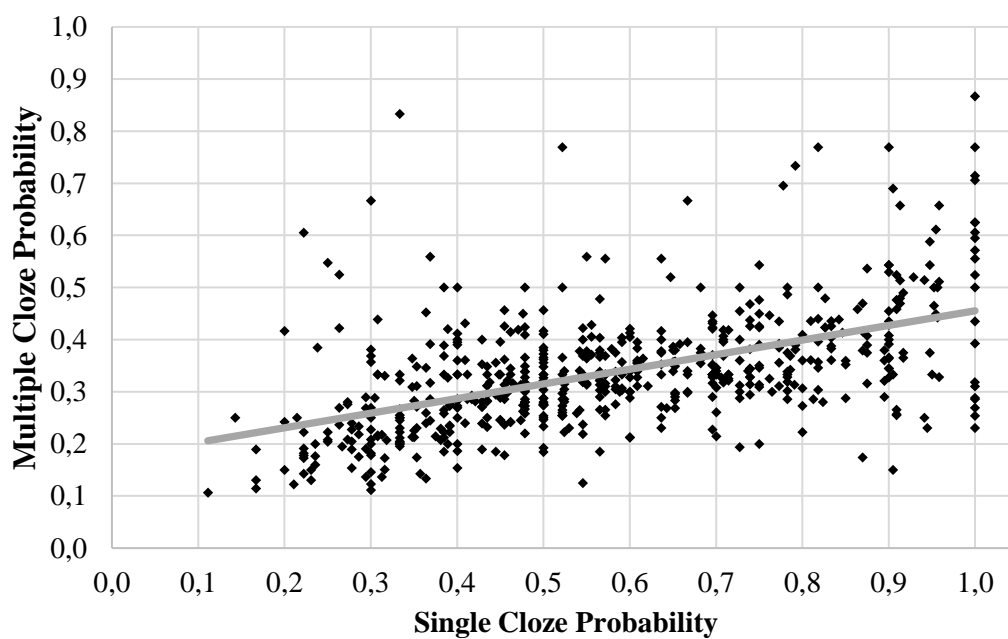
Variables		<i>M</i>	<i>SD</i>	Range
Single	Cloze probability ^a	.58	.21	.11 – 1
	Type-token ratio	.30	.16	.04 – .9
	Idiosyncratic responses ^b	.15	.13	0 – .8
Multiple	Cloze probability ^a	.34	.11	.11 – .87
	Type-token ratio	.31	.12	.08 – .73
	Idiosyncratic responses ^b	.17	.10	0 – .57

Note. *M* = mean; *SD* = standard deviation.

^a Cloze probability of the most expected word. ^b Proportion of idiosyncratic responses.

Figure 3

Association between Single and Multiple Cloze Probabilities



As shown in Table 4, the type-token ratio was negatively correlated with the cloze probability of the most frequent word, both in single ($r = -.76, p < .01$) and multiple measures ($r = -.39, p < .01$). The more strongly a word is expected, the narrower the range of completion words supplied. The proportion of idiosyncratic responses was also negatively correlated with the cloze probability (single: $r = -.52, p < .01$; multiple: $r = -.24, p < .01$). Thus, the more constrained the sentence is towards a specific word, the smaller the number of idiosyncratic responses. For both measures the strength of the correlation was stronger for the measures that only considered the first answer provided (single completion). In contrast to Experiment 1, the sentence length did not show any significant correlation with single or multiple measures (see Table 4).

Table 4

Correlation Matrix Between Measures Computed from the Distribution of Responses and Stimulus Characteristics

Variable	Single CP ^a	Multiple CP ^a	TTR Single	TTR Multiple	IDIO ^b Single	IDIO ^b Multiple	Sentence Length
Single CP ^a	1						
Multiple CP ^a	.53**	1					
TTR Single	-.76**	-.42**	1				
TTR Multiple	-.28**	-.39**	.51**	1			
IDIO Single ^b	-.52**	-.29**	.90**	.48**	1		
IDIO Multiple ^b	-.20**	-.23**	.41**	.93**	.41**	1	
Sentence Length	0	.03	.03	.01	.02	-.01	1

Note. CP = cloze probability; TTR = type-token ratio; IDIO = idiosyncratic responses.

^a Cloze probability of the most expected word. ^b Proportion of idiosyncratic responses.

** $p < .01$.

2.3.2.2. Response Times

We examined whether there was an association between the time that participants took to complete the sentence fragments, the word cloze probability, and the distribution of responses. As can be seen in Table 5, there was a negative correlation between the response time of the first word produced and the single cloze probability ($r = -.32, p < .01$): as cloze probability increased, response times to the first word decreased. The second and third response times were not correlated with the single cloze probability. The multiple cloze probability was positively correlated with the response time of the third word ($r = .12, p < .01$): as cloze probability increased, response times to the third word also increased.

Table 5

Correlation Matrix Between Measures Computed from the Distribution of Responses and Stimulus and Responses Times

Response Times	Single			Multiple		
	CP ^a	TTR	IDIO ^b	CP ^a	TTR	IDIO ^b
1 st Response	-.32**	.40**	.35**	-.05	.26**	.20**
2 nd Response	-.01	.10*	.13*	.06	.15**	.12**
3 rd Response	.08	-.04	.01	.12**	.04	.05

Note. CP = cloze probability; TTR = type-token ratio; IDIO = idiosyncratic responses.

^a Cloze probability of the most expected word. ^b Proportion of idiosyncratic responses.

* $p < .05$. ** $p < .01$.

The single type-token ratio and single proportion of idiosyncratic responses were both positively correlated with the time to provide the first and the second words (see Table 5). Participants were faster to complete sentences that generated a fewer number of

different completions and that had a lower number of idiosyncratic answers. The multiple computation of the type-token ratio and of the proportion of idiosyncratic responses showed a similar pattern (see Table 5).

2.3.2.3. Consistency across Paradigms

To assess the extent to which responses elicited by the current procedure agreed with the paper-and-pencil norms of Experiment 1, we compared the responses to the 62 sentence fragments presented in both experiments (see Table 6 for descriptive measures). The sentences selected had different syntactic structures and a range of context length from 6 to 11 words ($M = 8.81$, $SD = 1.27$). For 52 of the 62 sentences (84%) the most expected word was the same in both procedures. Noteworthy, for the ten sentences in which the most expected word differed, the words that were the most expected in Experiment 1 were also used by the participants to complete the sentences in Experiment 2, but were either the second or third most expected words (in 9 cases the words were the second most expected and in 1 case the word was the third most expected).

In addition, there was a correlation between Experiments 1 and 2 in regard to the cloze probability ($r = .68$, $p < .01$), type-token ratio ($r = .69$, $p < .01$) and proportion of idiosyncratic responses ($r = .53$, $p < .01$). Furthermore, as displayed in Table 7, there was a significant negative correlation between type-token ratio and cloze probability in both studies (Experiment 1: $r = -.54$, $p < .01$; Experiment 2: $r = -.71$, $p < .01$). The proportion of idiosyncratic responses was also negatively correlated with the cloze probability of the most frequent response (Experiment 1: $r = -.40$, $p < .01$; Experiment 2: $r = -.52$, $p < .01$).

The significantly high correlation between responses obtained in both experiments for the same items provides clear evidence for the consistency of the cloze probabilities across procedures.

Table 6

Descriptive Statistics for Cloze Probability, Type-Token Ratio and Proportion of Idiosyncratic Responses for Experiment 1 and for Experiment 2

Experiment	Variables	<i>M</i>	<i>SD</i>	Range
Experiment 1 (single)	Cloze probability ^a	.63	.12	.42 – .97
	Type-token ratio	.18	.07	.06 – .4
	Idiosyncratic responses ^b	.08	.06	0 – .27
Experiment 2 (single)	Cloze probability ^a	.59	.20	.11 – .95
	Type-token ratio	.25	.12	.09 – .72
	Idiosyncratic responses ^b	.12	.10	0 – .48

Note. *M* = mean; *SD* = standard deviation.

^a Cloze probability of the most expected word. ^b Proportion of idiosyncratic responses.

Table 7

Correlation Matrix Between Measures Computed from the Distribution of Responses and Stimulus for Experiment 1 and Experiment 2

Variables	Experiment 1			Experiment 2		
	CP	TTR	IDIO	CP	TTR	IDIO
Experiment 1 (single)	CP	1				
	TTR	-.54**	1			
	IDIO	-.40**	.89**	1		
Experiment 2 (single)	CP	.68**	-.50**	-.30*	1	
	TTR	-.47**	.69**	.54**	-.71**	1
	IDIO	-.34**	.64**	.53*	-.52**	.92**

Note. CP = cloze probability; TTR = type-token ratio; IDIO = idiosyncratic responses.

^a Cloze probability of the most expected word. ^B Proportion of idiosyncratic responses.

* $p < .05$. ** $p < .01$.

2.4. Discussion

The present study aimed to create a dataset of European Portuguese sentence completion norms to aid research on the effects of context and word expectancy in language processing. In recent years there has been an increasing effort to validate norms for the Portuguese population, including norms for images (e.g., Garrido & Prada, 2017; Prada, Garrido, Camilo, & Rodrigues, 2018; Soares et al., 2014), sounds (Soares et al., 2013), affective words (Soares, Comesaña, Pinheiro, Simões, & Frade, 2012), typicality ratings (Santi, Raposo, & Marques, 2015) and emoji and emoticons (Rodrigues, Prada, Gaspar, Garrido, & Lopes, 2018). Yet, for sentence completion there is only one dataset available, normed on children and adolescents (Pinheiro et al., 2010). In our study, a total of 806 sentences were evaluated by a sample of young and healthy adults, of which 268 sentences were collected using the classical single-production paradigm in paper-and-pencil protocol, while the remaining were collected in a multiple-production paradigm computer-based task. The dataset included a wide-ranging distribution of single cloze probabilities (from .11 to 1) for both protocols. In contrast with prior studies that only tested sentences with strong context constraint (Block & Baldwin, 2010; Bloom & Fischler, 1980), our goal was to create a dataset with sentences with different levels of contextual constraint. Indeed, the sentences in our dataset were equally distributed with approximately one third being weakly constrained ($< .50$ cloze probability), one third moderately constrained (cloze probability between $.5$ to $.7$) and the remaining strongly constrained ($> .7$ cloze probability).

In the multiple-production paradigm, the two methods used to compute the sentence completion scores resulted in distinct cloze probability distributions. While the distribution of single cloze probability was approximately normal, the multiple cloze probability had a skewed left distribution. The lower values of cloze probability in the

multiple method were expected as the number of responses for a given word was divided by all valid answers, and thus the denominator could increase up to 3 times compared with the single method. Some studies have calculated the multiple cloze probability score in a different manner, by dividing the number of answers for the same word by the number of participants (McDonald & Tamariz, 2002; Schwanenflugel & Shoben, 1985). This method shifts upwards the multiple cloze probability score. However, the sum of the cloze probability of the valid answers is different from one and for that reason we did not employ this formula. Despite the distinct distributions, there was a correlation between the scores of both cloze probabilities. Sentences with words with higher single cloze probability also had higher values of multiple cloze probability. Importantly, the most frequently produced word was consistent across methods, considering only the first response or all the valid responses. As such, data obtained in the single and multiple production paradigms are closely related and are thereby comparable.

The complementary measures revealed that each sentence was often completed with various words. In particular, the mean single type-token ratio demonstrated that on average each sentence fragment was completed with 6 distinct words. Most of these words were evoked by more than one participant, since the mean proportion of idiosyncratic responses was lower than the type-token ratio. The average of idiosyncratic responses for each sentence fragment was 3, those three words were only answered by one of the participants. Crucially, these complementary measures were correlated with cloze probability: for sentences associated with higher cloze probability fewer words were used to complete the sentences and there was a lower proportion of idiosyncratic responses. These findings were consistent across protocols (paper-and-pencil and computer-based) and paradigms (single *vs.* multiple cloze probability), and are in line with prior literature (McDonald & Tamariz, 2002; Schwanenflugel, 1986). These

measures added information regarding the context constraint of each sentence fragment, as they reflect the variety of completion words supplied by the participants (McDonald & Tamariz, 2002; Schwanenflugel, 1986). Using that information, it is possible to differentiate the strength of context for sentences that have an equivalent cloze probability. For example, the sentence “O pai do André foi à escola falar com o” had high cloze probability, since the most frequently word used to complete it was ‘professor’ with .87 of single cloze probability, and a strong context constraint, since there was only one alternative answer ‘director’; while the sentence “Para manter a forma decidi fazer exercício no” had the same single cloze probability for the word ‘ginásio’, but had a weaker context constraint, since several alternative answers were provided by the participants ‘caderno’, ‘chão’ e ‘parque’. In spite of splitting sentences in high and low constraint considering only the cloze probability, as it has been frequently done in previous studies (e.g., Federmeier et al, 2007; Ng, Payne, Steen, Stine-Morrow, & Federmeier, 2017; Thornhill & Van Petten, 2012), it may be useful to also take into consideration these complementary measures. Even though they are related with cloze probability, they provide a more specific measure of the sentence constraints, since they rely on the amount and type of words used to complete each sentential fragment.

Even though cloze probability has become one of the most widely used task to explore the mechanisms underlying sentence comprehension, there are several limitations to it. Given that it is an explicit language production task, the instructions, the paradigm demands, and the language experience/exposure of the participants can have a significant impact in the scores. On the contrary, the implicit corpus-based measures, as the forward transitional probability – the likelihood that a word follows another word in a specific linguistic corpus (e.g., Frisson, Rayner, & Pickering, 2005; McDonald & Shillcock, 2003) – and the entropy – the conditional probabilities of words given the text so far (Frank,

Otten, Galli, & Vigliocco, 2015; Willems, Frank, Nijhof, Hagoort, & Van Den Bosch, 2016; Yun, Maurer, Roland, & Koenig, 2012), are independent of task related issues or participant experience. However, these implicit measures are generally related with cloze probability, and in some cases their effects are part of the main effects of cloze probability (Frisson et al., 2005). Additionally, cloze probability predicts reading times better than other corpus-based measures (Smith & Levy, 2011).

Regarding the impact of sentence length on cloze probability, our data were not conclusive. In experiment 1, a weak though significant positive correlation was found. This finding is congruent with prior literature that had reported that sentence length generally increases the contextual constraint leading to higher cloze probability scores (McDonald & Tamariz, 2002; Van Petten & Kutas, 1990). In contrast, in experiment 2 there was no correlation between length and cloze probability nor between length and the two complementary measures (i.e., token-type ratio and proportion of idiosyncratic responses). Accordingly, previous studies have demonstrated that sentences with the same number of words may have different scores of cloze probability (see dataset Pinheiro et al., 2010).

The analysis of the response times of Experiment 2 revealed that participants were faster to type their first response to sentences with higher cloze probability. This effect was observed just for the first answer and only considering the single cloze probability. This result is congruent with a previous study that has shown that words with higher cloze probability are named faster than words with lower cloze probability (Staub et al., 2015). Additionally, responses were faster for sentences with strongly constraining contexts, as demonstrated by the positive correlation between the response times for the first and second responses, and the type-token ratio and the proportion of idiosyncratic responses. These effects were observed for both single and multiple scores. Similar findings were

reported by Staub et al. (2015) who analysed the latency to initiate a response. Even though this study and ours differ considerably both in the way participants gave their answer (naming aloud *vs.* typing in the computer) and in how response times were measured (word onset *vs.* word ending), the pattern of results are similar and point out the impact of both cloze probability and context constraint in response times in a cloze task.

The 62 sentences tested in both paradigms (single- and multiple-production) and protocols (paper-and-pencil protocol and computer-based task) had similar single scores. Specifically, the single cloze probability across experiments was strongly correlated, and the single type-token ratio and proportion of idiosyncratic responses also showed strong correlations between the paradigms. Moreover, in most of the sentences the same word was produced to complete the sentence fragment. Besides the differences in the methodology, participants were also different between experiments, even though belonging to the same population, *i.e.*, undergraduate students of Universidade de Lisboa. The strong and significant correlations found for all scores computed in both experiments for the same items provide robust evidence for the consistency of the cloze probabilities. Moreover, it ensures that the results obtained in the classical paradigms are likely replicable using computer-based tasks, which have a lower cost, are faster to code and are less prone to coding mistakes. In spite of the consistency found in these experiments, caution should be taken when generalizing the norms for other Portuguese-speaking population (*e.g.*, Brazil, Angola) or for different aged population (*e.g.*, old adults), since cloze probabilities can be influenced by cultural and linguistic specificities, as pointed out by previous literature (Arcuri et al., 2001; Bloom & Fischler, 1980; Carneiro, Albuquerque, Fernandez, & Esteves, 2013; Comesaña, Fraga, Moreira, Frade, & Soares, 2014).

2.5. Conclusion

In two experiments we created, analysed and made available norms of sentence completion in European Portuguese in the young adult population. This dataset was obtained using the classical single-production paradigm collected in paper-and-pencil protocol (Experiment 1) and in multiple-production paradigm collected through a computer-based task (Experiment 2). These norms (presented in Appendix A) include 806 sentence fragments, the responses generated for each fragment and the cloze probability of each word generated. Additionally, we incorporated two other measures – type-token ratio and proportion of idiosyncratic responses – computed from the distribution of participants’ responses, that provide information regarding the sentence context constraint. Our results demonstrated great consistency in the cloze task, regardless of the way used to calculate the sentence scores (single *vs.* multiple responses) and the protocol employed (paper-and-pencil *vs.* computer-based).

The present set of sentence-completion norms is expected to contribute to cognitive and neural research using the European Portuguese language, namely aiding the selection and characterization of stimuli to be employed in experimental paradigms of sentence processing. Furthermore, these norms assert that cloze measures are robust and comparable between paradigms.

3. EXPLORING THE NATURE, SCOPE AND MODERATORS OF CONTEXT FACILITATION EFFECTS

3.1. Introduction

Sentence comprehension is a complex, dynamic and multifaceted phenomenon. Several factors affect sentence comprehension, such as the lexical properties of the words, the context where those words are embedded, the task demands and the individual abilities of the readers. In the realm of sentence comprehension studies it has been consistently found that the time to process each word is modulated by the lexical properties of those words, including word frequency and length (e.g., Ashby, Rayner, & Clifton, 2005; Ng et al., 2019). Yet, the same word can be read faster as a function of the prior sentential information (e.g., Dirix, Brysbaert, & Duyck, 2018; Stanovich & West, 1983). If the sentential context provides support to a specific word, this word is processed faster than when it appears in a non-supportive context (e.g., the word ‘snow’ in “the skier was buried in the” vs. “they said it was the”⁴). Similarly, a word that is expected to appear in a certain context is read faster compared with an unexpected word (e.g., the word ‘mud’ in the sentence “the skier was buried in the”). Although it is widely accepted that readers use the sentential context to facilitate word processing (e.g., Schwanenflugel & Shoben, 1985; Stanovich & West, 1983; West & Stanovich, 1981), it is unclear if the ability to effectively do so varies depending on the processing demands of the task at hand and across people as a function of general cognitive abilities and reading skills.

⁴ Examples from Stanovich & West (1983).

The present study aims to investigate the nature and scope of the cognitive processes underlying expectancy effects during sentence comprehension, and to examine if the magnitude of these effects is modulated by the task demands and the readers' skills.

3.1.1 The Scope and Nature of the Expectancy Effect

The impact of context on the processing of upcoming words has been frequently examined using the self-paced moving window paradigm (Just, Carpenter, & Woolley, 1982; Mitchell, 1984). It consists of a reading task that measures the time that the participant takes to read each word (or segment). The reader controls the presentation duration of each word, since only when he/she presses a button does the next word appear. Importantly, only one word is visible at each time: when the reader presses the button, the successive word appears and the preceding word disappears, normally masked by dashes. The time elapsed between successive button presses is taken as a measure of the reading time of each word⁵. It is assumed that reading times reflect the time needed to execute processes associated with the access and integration of the material displayed (Mitchell, 1984). Usually, besides analysing the reading times of the target words (for example, the expected and unexpected words), the reading times of the successive words are also examined. As each word is immediately followed by the beginning of a new word, any incomplete processing will spill-over from the reading time of the target to the reading time of the following word(s). Therefore, spill-over effects, usually associated with the first and second subsequent words, are also assumed to reflect processes related to the integration of the target words on the sentential context (Mitchell, 1984).

Using this paradigm, previous research has shown that expectancy effects are pervasive. Reading times are shorter for expected than unexpected words, and this

⁵ Reading time is also affected by other processes, e.g., motor action. Yet, these processes should modulate equally all reading times, independently of the properties of each word.

difference extends to the spill-over words (e.g., Brothers et al., 2017; Hintz et al., 2016; Ng et al., 2017). Additionally, word expectancy also affects sentence comprehension, since participants take longer to answer comprehension questions that follow sentences completed with unexpected relative to expected words (Ng et al., 2017). These studies did not explore if the degree of expectancy of the expectable words modulates the facilitation effects, since the expected word was always the most frequently used word in that sentence context and this context was always highly constrained allowing a narrow number of possible candidates. Yet, preliminary evidence from an eye-tracking while reading study that manipulated the sentential context constraint demonstrated that moderately expected words were also more easily processed than unexpected words, as reflected by reduced first fixation times, gaze duration and total fixation times for moderately expected than for unexpected words (Rayner & Well, 1996). Importantly, the three fixation-time measures showed that the moderately expected words did not differ from highly expected words, suggesting that expectancy effects are found across all expectable words, from moderately to highly expected. In this study all expected words were the most expected word in a given sentential context; the difference across conditions was the context constraint. Thus, it is still unknown if an expected word that is not the most expected one, but for instance the second most expected (i.e., second-best), is also more easily processed during sentence comprehension.

Expectancy effects have been associated with at least two distinct processes that occur during sentence comprehension: word retrieval and word integration. The former relates to the retrieval of lexical and semantic information of each word, while the latter reflects binding the meaning of the word with the meaning of the sentential context. Some authors have proposed that expectancy effects arise from facilitated word access, as readers use the sentential context information to anticipate the upcoming words (Brothers

et al., 2015; Ng et al., 2017). This hypothesis, based on the predictive accounts of language (Huettig, 2015; Kuperberg & Jaeger, 2016), is supported by electrophysiological evidence demonstrating that the differences between the expected and unexpected words emerge rapidly during the onset of the target words (e.g., Federmeier et al., 2007; Kutas & Hillyard, 1984; Thornhill & Van Petten, 2012). Specifically, these studies have found a reduced negativity starting around 300ms after the word onset for expected words compared with unexpected words (see Kutas & Federmeier, 2011 for revision). This finding has been interpreted as an index of the facilitation of accessing the expected words, that is driven by pre-activation of semantic and lexical features (Brothers, Swaab, & Traxler, 2017; DeLong et al., 2005; Kutas & Federmeier, 2000).

The use of predictive strategies may be important during sentence comprehension, as it allows readers to read faster and to optimize cognitive resources (Huettig & Mani, 2016; Kuperberg & Jaeger, 2016, for a review). How these anticipatory processes are implemented is a matter of intense debate. Some authors have proposed that prediction occurs by a serial graded process, i.e., readers can initially predict the most expected word, and only if this prediction is disconfirmed the system updates the predictions towards other probable candidates (e.g., Thornhill & Van Petten, 2012). Alternatively, it has been postulated that prediction is a probabilistic parallel process in which multiple possibilities are considered at the same time, i.e., readers compute and pre-activate at any given time all the probable candidates. The level of activation of each of those candidates will reflect their degree of expectancy in that sentence context (e.g., DeLong, Urbach, & Kutas, 2005). Previous studies have not clearly disentangled between these two alternatives and thus how anticipatory mechanisms are implemented remains elusive.

Alternatively, it has been argued that the expectancy effect reflects the degree of facilitation to integrate the upcoming words with the previous context (Hagoort, 2005). Faster reading times for expected relative to unexpected words occurs because the former is easier to integrate, as they receive more support from the preceding context. In line with this view, previous research has demonstrated that the expectancy effect extends to, or even only appears in words that follow the target word (i.e., the spill-over region). In a self-paced moving window study, a delay in reading times was only observed for words succeeding the unexpected word (Hintz et al., 2016). This suggests that context has an impact later in processing, when a word that has been encountered is integrated with information obtained from previous words⁶.

3.1.2. Impact of Task Demands on the Expectancy Effect

Anticipatory mechanisms of word retrieval can, under some circumstances, optimize sentence comprehension (e.g., DeLong et al., 2005; Federmeier, 2007). Notwithstanding, these mechanisms may require additional effort to inhibit competing alternatives and can be metabolically costly (Brothers et al., 2017; Kuperberg & Jaeger, 2016). Thus, it has been proposed that an efficient reader may suppress anticipatory mechanisms when there is no benefit in their use. Other authors defend that word retrieval mechanisms are automatic and unconscious. They argue that external factors, like reader's strategies or task demands, do not have an impact in the reading processes (for further discussion see Brothers et al., 2017; Huettig & Mani, 2016; Kuperberg & Jaeger, 2016).

There are only a few studies that have investigated the influence of the task on reading time. Hintz et al. (2016) have reported that language production encourages the

⁶ See section 4.1 for a more exhaustive discussion on anticipatory retrieval mechanisms and word integration processes.

use of anticipatory mechanisms during sentence reading. In a first experiment, the authors found an expectancy effect in a picture naming task (participants heard a sentence and, at the end, a picture that could be expected or unexpected appeared and they had to name it), such that participants were faster to name expected pictures compared to unexpected pictures, but the effect vanished when participants only read those sentences in a self-paced moving window task. The authors pointed that the lower cloze probability of the expected words (mean CP = .39; range: .06 – .80) could have undermined the facilitation effect in the reading task. Importantly, the same sentences were used in both tasks, so the difference cannot be attributed to the materials used. In a second experiment, the naming trials were interpolated with reading trials. The results revealed that participants were faster to name and also to read the expected words than the unexpected words. Thus, the expectancy effect was enhanced when the reading trials were alternated with naming trials. The authors proposed that readers relied more on context information to anticipate upcoming words when they also performed a production task that encouraged prediction, suggesting that the mechanisms used by readers are flexible and adjustable to task demands.

In another study, Brothers et al. (2017) manipulated the completion of an initial set of sentences to evaluate if readers would adapt their reading strategies to allow a more efficient sentence comprehension. The initial set of sentences could be all completed with the most expected word (strong validity condition), half completed with the most expected word and the other half with unexpected words (medium validity condition) or all sentences completed with unexpected words (weak validity condition). The results for the experimental sentences that followed the initial set revealed an expectancy effect only for readers of the high and medium validity condition. In contrast, for those initially exposed to sentences completed with unexpected words, reading times of the target words

did not differ, regardless of whether they were expected or unexpected. Thus, the processing demands associated with the task at hand might flexibly modulate the expectancy effect. These results support the view that readers can optimize reading processes, namely the use of anticipatory mechanism of word retrieval. Yet, given that so far, to the best of our knowledge, only these studies have addressed this question, it is important to replicate these findings to confirm the influence of the task demands on the magnitude of the expectancy effects.

3.1.3. Individual Factors Moderating the Expectancy Effect

Over recent years, language accounts have postulated that anticipatory mechanisms of word retrieval in reading are modulated by the reader's cognitive abilities (Huettig, 2015; Kuperberg & Jaeger, 2016). There has been an increasing number of studies exploring the impact of working memory span and literacy skills in language comprehension (Ashby et al., 2005; Huettig & Janse, 2016; Ng et al., 2017) and production (e.g., Estevez & Calvo, 2000).

Working memory is a cognitive system responsible for the transitory storage and computation of the currently activated representations (Baddeley, 2010; Baddeley & Logie, 1999; Just & Carpenter, 1992). It is a limited resource, as there is a maximum amount of representations that can be simultaneously activated. A frequently used task to assess working memory capacity, especially in the context of language processing, is the reading span task (Daneman & Carpenter, 1980; Just et al., 1982; Mitchell, 1984). In its original version, participants read sets of unrelated sentences, that they have to categorize (i.e., to identify if the sentence “made sense” or not) and are asked to memorize the final word of each sentence. When a recall cue appears, participants must recall the final words of each sentence of the set in the same order that they had appeared. In alternative versions, the sentences are paired with an additional word (unrelated with the sentence)

or letter that participants have to remember (Kane et al., 2004). Verbal working memory span is measured by the number of correctly remembered final words of the larger set. It has been shown to predict older adult's ability to use context information for the recognition of upcoming words when listening to sentences (Janse & Jesse, 2014). Additionally, readers with higher verbal working memory span name expected words faster than unexpected words, independently of the interval between the presentation of the sentence frame and the target word. In contrast, readers with low verbal working memory span have only shown an expectancy effect in naming when there was a longer interval (Estevez & Calvo, 2000). Verbal working memory span also predicts comprehension ability measures, specifically reading comprehension and verbal scholastic aptitude score (Friedman & Miyake, 2004). Moreover, a recent study has shown that enhanced working memory abilities predict anticipatory eye movements in a visual world paradigm (Huettig & Janse, 2016). In this paradigm, participants hear spoken sentences about a visual display (e.g., "The boy will eat the CAKE") while their eye gaze is monitored. The visual display contains a critical object (e.g., 'cake') and three distractor objects (e.g., 'ball, train, car'). Participants with higher working memory span launch eye movements towards the critical object before they hear the critical object name, using the context constraint or the lexical properties of the prior words (e.g., gender of articles). These findings support the capacity-based view that proposes that readers with higher working memory span are more able to keep and update a coherent representation of the sentence content in working memory (Just & Carpenter, 1992). Yet, the results so far have not been consistent. There are studies using the visual word paradigm that have not found an effect of working memory abilities in anticipatory eye movements (Kukona et al., 2016) nor in comprehension accuracy (Van Dyke, Johns, & Kukona, 2014).

Some accounts have argued that prediction during language processing is mainly influenced by the reading abilities of the participants (Mani & Huettig, 2014; Mishra, Singh, Pandey, & Huettig, 2012). Even only among fluent readers, reading abilities vary considerably according to the participants' level of expertise in reading, which is normally related with the familiarity and exposure to reading materials. Several tests have been developed to evaluate reading abilities, such as the Nelson-Denny test (Ashby et al., 2005), the Slosson Oral Reading Task, the Woodcock–Johnson Reading Fluency task, and the Rapid Automatized Naming (Ng et al., 2017). In the Portuguese population, the 1-min version of Teste de Idade de Leitura (Reading Age Test; 1-min TIL) is validated for college students (Fernandes, Araújo, Sucena, Reis, & Castro, 2017). This is a paper and pencil, multiple-choice, sentence completion test. Participants have 1 minute to silently read and complete as many sentences as possible out of a set of 36 – such as “Pega na saca e vai-me comprar...” (artes, laranjas, lâminas, lavatórios) [“Hold the bag and go to buy...” (arts, oranges, blades, sinks)]. The number of sentences completed correctly indexes reading comprehension abilities. Previous studies have shown that less skilled readers exhibited an overall slower reading time. In addition, they took longer to read words embedded in weakly constraining context and read more slowly unexpected than expected words in both weakly and strongly constraining context, leading to a significant difference between the reading times of unexpected and expected words. Conversely, more skilled readers demonstrated a selective slowdown for unexpected words in strongly constraining contexts and exhibited a reduced difference between unexpected and expected words than the less skilled readers (Ng et al., 2017). The authors suggested that less skilled readers showed more difficulty in accessing and integrating the meaning of words during sentence comprehension. Additionally, less skilled readers seem to have a delayed lexical access when they read low-frequency unexpected words in highly

constraining contexts in the spill-over region, revealing a frequency effect. Conversely, no reliable frequency effect was observed in that region for highly skilled readers (Ashby et al., 2005). Finally, research employing the visual world paradigm have shown that skilled readers use more frequently and more quickly anticipatory eye movements compared with less skilled readers (Mani & Huettig, 2012, 2014). Of note, a recent study demonstrated that the language comprehension level of the participant does not seem to be a relevant predictor of the anticipatory eye movements (Kukona et al., 2016). The authors analysed the impact of several language and cognitive skills (e.g., reading and listening comprehension, vocabulary, rapid automatized naming, working memory, matrix reasoning) and observed that only the score obtained in rapid automatized naming tasks affected significantly the proportion of anticipatory eye movements (Kukona et al., 2016).

Thus, it remains unclear how individual differences in cognitive abilities influence reading (e.g., in reading times) and to what extent these differences also affect specific processes of sentence comprehension, notably word retrieval and integration.

3.1.4. The Current Study

Taking advantage of the self-paced reading task, the present study aims to explore the cognitive processes that underlie expectancy effects with particular attention to early anticipatory word retrieval mechanism and more delayed integration processes. The second objective is to characterize the extension of these facilitatory effects, i.e., if they are restricted to the most expected word or if they spread to all probable candidates. To experimentally explore these questions, we compared not only the processing of the most expected vs. unexpected word, as it has been done in previous studies, but also inspected the processing of the second-best candidate, i.e., the second most expected word in a sentence. For instance, in the sentence “The puppy chewed on the”, the most expected

word is 'bone', the second most expected word, second-best, is 'shoe', and an unexpected word is 'pencil' (Bloom & Fischler, 1980). Critically, the three words are plausible completions for the same sentential frame but have different levels of expectancy (Expected > Second-Best > Unexpected). The manipulation of expectancy in three distinct levels also allows us to investigate the nature of the expectancy effect, namely if it occurs due to an easier integration of the probable candidates or if it is associated with anticipatory word retrieval. According with the integration account, there should be a facilitation effect for all words that are expected in that sentential frame, therefore both expected and second-best words should be processed more easily than unexpected words (Expected = Second-Best < Unexpected). Alternatively, considering the predictive accounts, we expect an early expectancy effect enhanced for the most expected word. The predictive accounts of language propose that the expectancy effect occurs due to anticipatory retrieval of the expected words, but the hypotheses differ according to the way the activation of words occur, i.e., if they are serial graded or probabilistic activated. Following the serial graded proposal, we hypothesise that in an initial moment there should be no facilitation effect for the second-best word, because only the most expected word is pre-activated. Therefore, there should be a significant difference in the reading time of the most expected words and the second-best words, especially for target words (Expected < Second-Best = Unexpected). Conversely, according to the parallel probabilistic account we expect that the processing of the second-best word should be facilitated since all probable candidates are pre-activated. Importantly, the effect for the second-best words should be of smaller magnitude since those words are not so strongly expected. Specifically, the reading times should reflect the level of expectancy of the target words (Expected < Second-Best < Unexpected).

Our third goal is to explore if expectancy effects are modulated by the task demands. Inspired by Brothers et al. (2017), we manipulated the proportion of expected words used to complete the sentences and the sentence constraint of an initial set of sentences. In total there were four distinct initial sets in a between-participants design. Two of the initial sets were composed only of sentences that were completed with the most expected words (strong validity sets), one with high constraint sentences and the other with low constraint sentences. In the other two initial sets, only a small portion of the sentences were completed with the most expected word (10%), while the majority of the sentences were completed with an unexpected word (90%; weak validity sets). Once again, one of such sets contained high constraint sentences while in the other set comprised low constraint sentences. If reading mechanisms are influenced by the demands imposed by the task, then the initial set should modulate the size of the expectancy effect of the subsequent sentences (experimental sentences). In particular, when initially exposed to sentences completed with expected words (i.e., strong validity sets), the readers may engage in predictive strategies to optimize reading and therefore an enhanced facilitation in processing probable candidates of the experimental sentences should be observed. On the contrary, if readers are exposed initially to sentences that are mostly completed with unexpected words (i.e., weak validity sets), readers may adjust their reading to rely less on context information and disengage predictive mechanisms. A reduction or absence of the expectancy effect could thus occur for the subsequent sentences. The context constraint of the initial set may also affect reading strategies, since only the high constraint sentences strongly bias the sentential context, enhancing the use of contextual information. If the context constraint of fillers affects the processing of the subsequent sentences, then readers exposed to high percentage of high constraint sentences should show an enhanced facilitation in processing probable candidates of the

experimental sentences. Nonetheless, if integration or anticipatory word retrieval are recruited in an automatic way, there should be no influence validity of the predictions or of the sentence constraint on the processing of the subsequent sentences.

Lastly, the fourth goal of this study was to inspect if and how individual differences in cognitive abilities affect task performance. We tested capacity based-views which emphasize the role of working memory, and experience-based accounts that propose that reading processes are influenced by the literacy skill of readers. To assess working memory span, we used a computer-paced reading span task. Literacy skill was evaluated through the 1-min TIL test. In an exploratory regression analysis, we tested if the two factors are predictive of the magnitude of the expectancy effects.

3.2. Method

3.2.1. Participants

Ninety-two participants (77 females, age $M = 19.43$ years, $SD = 5.14$) took part in this study. All were native speakers of European Portuguese and had no history of neurological impairment or reading disorder. Participants received a course credit compensation for their participation. Two participants were excluded since their reading time of the target words was three standard deviations above the mean reading time of all participants.

3.2.2. Material

Ninety sentences (mean number words = 9.44; range: 6 - 12) were selected from a pool of 806 sentences that were pre-tested in a cloze probability procedure (see details in Chapter 2). All sentences had a strong most expected word ($CP = .61$, $SD = .12$, range: .41 - .85) and a second most expected word (i.e., second-best; $CP = .19$, $SD = .05$, range:

.12 - .29). Additionally, each sentence could be completed with an unexpected word ($CP = 0$, $SD = .01$, range: 0 - .04). The unexpected words were not produced by the participants in the pre-test yet were syntactically and semantically congruent with the sentences (see examples in Table 8). Thus, each sentence frame was presented in the three experimental conditions – Expected, Second-Best and Unexpected – the only difference being the replacement of the target word. All target words were nouns and were matched for various psycholinguistic parameters (see Table 9), obtained from the P-Pal database (Soares et al., 2018), including word frequency ($F < 0.1$), length ($F < 1.5$), orthographic and phonological neighbours ($F < 1$ in both cases). Importantly, all sentences continued after the target word with a few more words (mean number of subsequent words = 5.49; range: 3 - 9) in order to explore spill-over effects (Table 8). The ninety experimental sentences were counterbalanced between participants to ensure that each participant saw only one instance of each sentential frame. Each participant read 30 sentences completed with the most expected word, 30 sentences completed with the second-best word and 30 sentences completed with the unexpected word.

Additionally, 180 sentences were selected to create the filler lists. Half of those sentences had a high constraint context ($CP = .82$, $SD = .13$, range: .57 - 1), while the other half had a low constraint context ($CP = .36$, $SD = .09$, range: .14 - .5). Each sentence was completed with either an expected word or an unexpected word (see Table 8 for examples). The set of expected and unexpected words in the high and low constraint filler sentences were matched in word frequency ($F < 0.90$), length ($F < 0.70$), orthographic and phonological neighbours ($F < 1.8$ in both cases; Table 9). Like the experimental sentences, the filler sentences continued after the target word with a few more words, so that all sentences presented had a similar number of words.

Table 8*Examples of Experimental Sentences, Filler Sentences and Target Words*

Sentence Type	Number Words		Ending Word	Example Sentences
	<i>M</i>	<i>SD</i>		
Experimental Sentences	14.97	0.77	Exp	O pai pediu-lhe para ir lá fora levar o <u>lixo</u> e voltar rapidamente para casa. (Dad asked him to go out to take the <u>trash</u> and come home quickly)
			SB	“O pai pediu-lhe para ir lá fora levar o <u>cão</u> e voltar rapidamente para casa.” (Dad asked him to go out to take the <u>dog</u> and come home quickly)
			Unex	“O pai pediu-lhe para ir lá fora levar o <u>tacho</u> e voltar rapidamente para casa.” (Dad asked him to go out to take the <u>pan</u> and come home quickly)
Fillers: High constraint	15.07	2.13	Exp	“A menina passava horas no quarto a brincar com as suas <u>bonecas</u> todas as tardes.” (The girl spent hours in the room playing with her <u>dolls</u> every afternoon)
			Unex	“A menina passava horas no quarto a brincar com as suas <u>joias</u> todas as tardes.” (The girl spent hours in the room playing with her <u>jewellery</u> every afternoon)
Fillers: Low Constraint	14.78	0.72	Exp	“O Marcelo não tinha dinheiro para pagar a <u>conta</u> e teve de pedir emprestado” (Marcelo had no money to pay the bill and had to borrow it)
			Unex	“O Marcelo não tinha dinheiro para pagar a <u>cerveja</u> e teve de pedir emprestado” (Marcelo had no money to pay the <u>beer</u> and had to borrow it)

Note. *M* = mean; *SD* = standard deviation; Exp = Expected; SB = Second-best; Unex = Unexpected

Four sets of filler sentences, each containing 90 sentences, were created to investigate if the demands associated with the task modulated the expectancy effect, specifically if the predictive validity and context constraint influence the use of strategic processing to optimize the reading of the subsequent sentences (the experimental sentences). Thus, there was a high constraint with strong validity set (in which 100% of the sentences were completed with expected words), a high constraint with weak validity

set (with 90% of the sentences completed with unexpected words and 10% completed with expected words), a low constraint with strong validity set (with 100% of the sentences completed with expected words); and a low constraint with weak validity set (in which 90% of the sentences were completed with unexpected words and 10% were completed with expected words). Participants were randomly assigned to one of these sets at the beginning of their experimental session (n=23 in high constraint with strong validity set, n=23 in high constraint with weak validity set, n=24 in low constraint with strong validity set and n=22 in low constraint with weak validity set).

Table 9

Means and Standard Deviations of the Lexical Characteristics of the Target Word of the Experimental and Filler Sentences

Sentence Type	Target Word	Word Frequency ^a		Word Length		Orthographic neighbours		Phonological neighbours	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Experimental Sentences	Exp	1.37	0.64	6.34	1.80	5.30	5.62	4.97	5.10
	SB	1.32	0.59	6.12	1.87	4.52	5.41	4.32	5.01
	Unex	1.27	0.69	6.57	1.82	4.37	5.21	4.73	5.79
Fillers: High Constraint	Exp	1.18	0.61	6.56	1.90	4.14	5.09	4.26	5.15
	Unex	1.09	0.59	6.38	1.87	4.46	4.63	5.54	5.71
Fillers: Low Constraint	Exp	1.18	0.64	6.78	2.11	3.64	4.79	3.84	5.11
	Unex	1.07	0.60	6.70	1.88	4.28	4.71	5.15	5.13

Note. *M* = mean; *SD* = standard deviation; Exp = Expected; SB = Second-best; Unex = Unexpected

^a Log-transformed word frequency.

3.2.3. Procedure

All sentences were presented using a one-word-at-a-time moving-window self-paced reading paradigm (Just et al., 1982), implemented in E-Prime (E-Prime 2.0,

Psychology Software Tools, 2006). On each trial, a sentence appeared on the screen with all the non-space characters replaced by a dash. Participants pressed the key “z” to view one word of the sentence at a time, with each keypress revealing the next word and reverting the previous word to dashes. After each sentence, participants answered a yes or no comprehension question by pressing “1” for yes and “2” for no. Participants had a maximum of 6 seconds to respond and there was an inter-trial interval of 750ms. Reading latencies for each word of the experimental and filler sentences, as well as accuracy and response time to the comprehension question were recorded. The task began with 3 practice items. Participants then read 180 sentences. First, the 90 filler sentences were randomly presented, in order to create a biasing setting. The fillers could be high constraint with strong validity, high constraint with weak validity, low constraint with strong validity or low constraint with weak validity, in a between-participants manipulation. Then, the 90 experimental sentences were presented, also in a randomized order. Participants were unaware of the transition from filler to experimental sentences, as all had the same structure. There was a break every 30 items, with the duration of the break defined by the participant. The task lasted approximately 35 minutes.

After the main task, participants performed two supplementary tasks: a computer-paced reading span task (based on Kane et al., 2004) and the 1-min TIL test (Fernandes et al., 2017). In the reading span task each item included an understandable or a nonsensical sentence and a to-be-remembered letter (e.g., “O Pedro saltou para a cama, que se partiu devido ao impacto. ? J”). Each sentence consisted of 10 - 14 words ($M = 11.96$, $SD = 1.28$). The sentence and the letter were presented onscreen for 5 seconds. In the time allotted, participants were instructed to press “1” if the sentence made sense and press “2” if it did not make sense. After the participant’s answer or after the 5 seconds had elapsed another sentence was presented. When presented with the recall cue, a

question mark that indicated that they had to recall the previous encoded letters, participants had to write each letter from the preceding set, in the order they had appeared. Set sizes ranged from two to five sentence–letter problems per trial. There were twelve trials in total: three sets of 2, 3, 4 and 5 sentence-letter problems, presented randomly.

In the 1-min TIL test, participants were presented with an A4 sheet with 36 items and were asked to perform the multiple-choice sentence completion test [e.g., “Ele ligou a rádio e ouviu as (notícias, delícias, natas, noites, nervuras)”] as fast and accurately as possible until the allotted time had elapsed (1 minute, not indicated to participants). Participants were asked to select by circling which of the words correctly completes each sentence. Before the test, participants were presented with four practice items, in a different sheet, and there was no time limit to complete it.

3.3. Results

3.3.1. Expectancy Effect

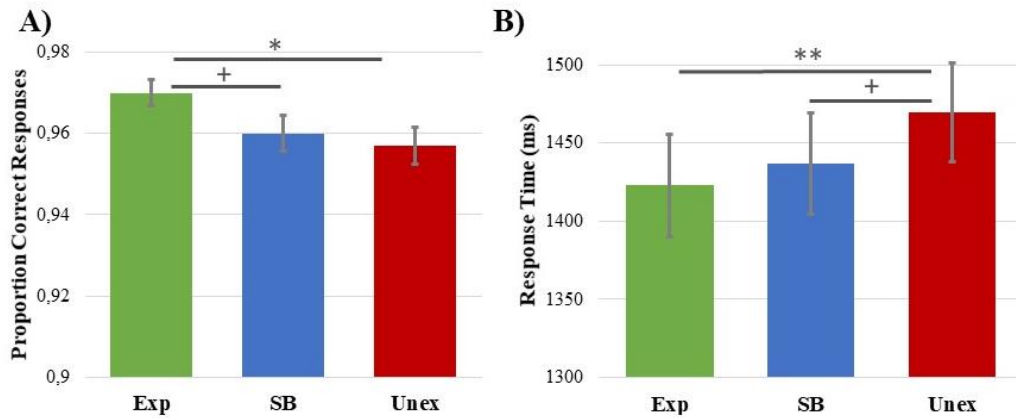
3.3.1.1. Comprehension Question

This analysis focused on the participants’ responses to the comprehension questions presented after each experimental sentence. Accuracy and response times (for correct responses) were analysed in two separate repeated-measures ANOVAs using Word Expectancy (Expected, Second Best, Unexpected) as within-participants factor. Response times above or below 3 standard deviations from the participant/condition mean were excluded, affecting less than 1.5% of the data. For all tests with more than one degree of freedom in the numerator, p -values were adjusted with the Huynh-Feldt correction for violation of sphericity. Significant ($p < .05$) and marginally significant ($p < .10$) effects were followed by pairwise comparisons, with Bonferroni correction. All statistical analyses were conducted using IBM SPSS 26.0 software (SPSS, Corp., USA).

The analysis of accuracy (Figure 4A) revealed a significant main effect of Word Expectancy [$F(2,178) = 3.93, p = .02, \eta_p^2 = .04$]. Participants gave significantly more correct responses to comprehension questions of sentences completed with an expected word compared to sentences with unexpected ($p < .05$) and second-best words ($p < .1$), with no significant differences between unexpected and second-best ($p = 1$).

Figure 4

Accuracy and Response Time to the Comprehension Probe for Expectancy Condition



Note. A) Mean proportion of correct responses to the comprehension probe by expectancy condition. B) Mean response time to the comprehension probe for each expectancy condition. Error bars indicate standard error of the mean. All significant pairwise differences (using Bonferroni-adjusted significance levels) for condition contrasts are indicated. Exp = Expected; SB = Second-Best; Unex = Unexpected.

+ $p < .1$. * $p < .05$. ** $p < .01$.

For response times (Figure 4B), a main effect of Word Expectancy ($F(1,178) = 5.51, p = .005, \eta_p^2 = .06$) was found, as participants took longer to respond to comprehension questions of sentences completed with unexpected words compared with

sentences completed with expected ($p < .05$) and second-best words ($p < .1$), with no significant difference between expected and second-best words ($p > .8$).

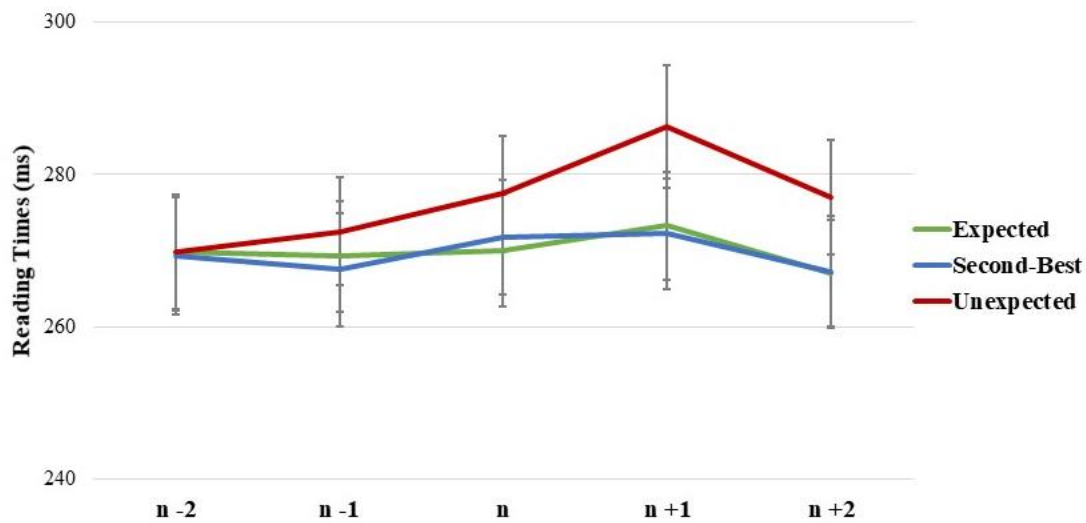
3.3.1.2. Reading Time

The raw reading time data were analysed for the 90 experimental sentences. Of particular interest was the analysis of the reading time of the target words of each sentence (i.e., expected, second-best, unexpected). In addition, as in previous studies, we explored the two words preceding and the two words following the target word (Brothers et al., 2017; Matsuki et al., 2011). Reading times above or below 3 standard deviations from the participant/condition mean were excluded, affecting less than 2% of the data. Word expectancy (Expected, Second Best, Unexpected) was the within-participants factor in a repeated-measures ANOVA.

There were no significant differences between expectancy conditions for the target words ($F < 0.5$) nor for the two words preceding the target ($F < 0.8$). In the spill-over region, a main effect of expectancy was found for the first [$F(1,178) = 19.32, p < .001, \eta_p^2 = .18$] and second words after the target noun [$F(1,178) = 10.84, p < .001, \eta_p^2 = .11$]. In both cases, words were read more slowly when following an unexpected word compared to an expected (n +1: $p < .001$; n +2: $p < .001$) and second-best words (n +1: $p < .001$; n +2: $p = .001$; see Figure 5). There were no significant differences in reading times for spill-over words that followed expected and second-best words ($p > .5$).

Figure 5

Mean Reading Times of each Word in the Three Expectancy Conditions



Note. n-2 = two words prior to the target words; n-1 = one word prior to the target words; n = target word; n+1 = first word following the target word; n+2 = second word following the target word. Error bars indicate standard error of the mean.

3.3.2. The Influence of Fillers on the Reading Times of Experimental Sentences

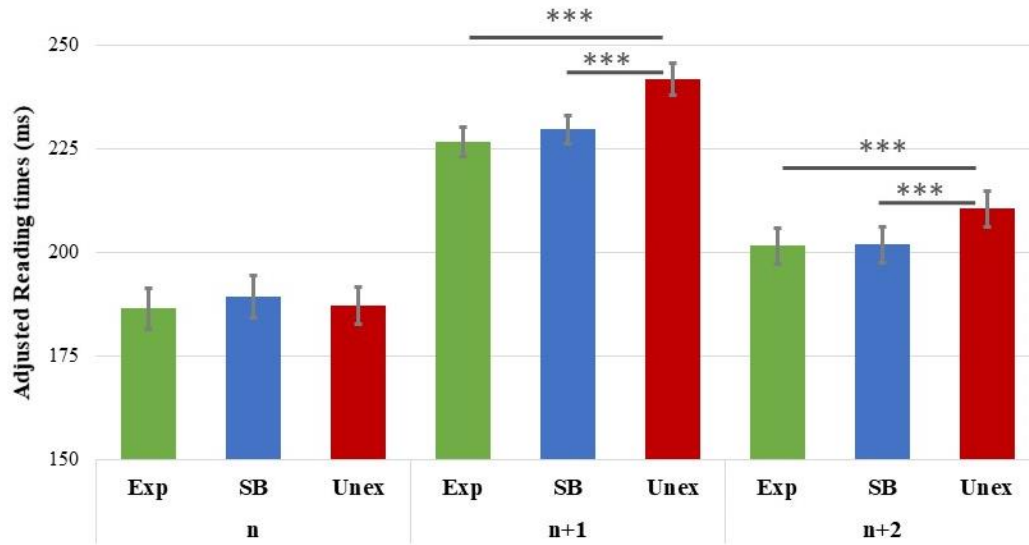
To understand if the expectancy effects observed were affected by the constraint and validity of the fillers set, we compared the length-adjusted residual reading times of each condition between filler conditions. The length-adjusted residuals were obtained by computing the linear regression equation for each subject expressing reading time for each word of all sentences as a function of the number of characters. The regression equation was used to obtain the expected reading time considering the number of characters. Then, the expected reading times were subtracted from the raw reading times and the resulting difference scores were submitted to an analysis of variance (Brothers et al., 2017; Ferreira & Clifton, 1986). The analyses were performed for the target words (n) and for the spill-over words (n+1 and n+2). Thus, three separate mixed design

ANOVAs were conducted, having Expectancy (Expected, Second Best, Unexpected) of the experimental sentences as within-participants factor and Context Constraint (High Constraint, Low Constraint) and Prediction Validity (Strong Validity, Weak Validity) of the filler sentences as between-participants factors.

Regarding the critical word, as in the raw reading times analysis, there was no main effect of expectancy ($F < 0.8$; Figure 6). Moreover, the constraint and expectancy of the fillers did not affect reading times (all $F < 2.0$; Figure 6). In the spill-over region, a main effect of expectancy was found for the first [$F(1,172) = 19.93, p < .001, \eta_p^2 = .19$] and second words after the target noun [$F(1,172) = 8.37, p < .001, \eta_p^2 = .09$]. In both cases, expected words were read faster than unexpected words (n +1: $p < .001$; n +2: $p < .01$; Figure 6); second-best words were also read faster compared to unexpected words (n +1: $p < .001$; n +2: $p < .001$; Figure 6). There were no significant differences between expected and second-best length-adjusted reading times for both spill-over words ($p > .4$). Critically, neither constraint nor prediction validity of the fillers affected the magnitude of the expectancy effects (all $F < 0.75$).

Figure 6

Adjusted Reading Times by word Expectancy



Note: Average length-adjusted reading times in the target (n) and spill-over words. All significant pairwise differences (using Bonferroni-adjusted significance levels) for condition contrasts are indicated. A fixed value of 275ms was added to each adjusted mean to improve the interpretability of the graph. Error bars indicate standard error of the mean.

n = target word; n+1 = first word following the target word; n+2= Second word following the target word; Exp = Expected; SB = Second-Best; Unex = Unexpected.

*** $p < .001$.

3.3.3. Individual Cognitive Abilities

3.3.3.1. Working Memory Span and Reading Skill

Working memory span was computed from the reading span data of 88 participants – four participants were excluded since they did not perform the task as required (e.g., did not evaluate if the sentences made sense). Working memory span was calculated using partial-credit unit scoring (Conway et al., 2005). In this scoring method, correctly recalled items are first counted as a proportion of the respective block, and no specific weight is given to harder items. The scores for each block are then averaged to

make up the final working memory span, which can thus range from 0 to 1. The score of the 1-min TIL test was calculated as the number of sentences that were completed correctly, i.e., for which the participant selected the correct word to complete the sentence frame. Descriptive statistics of the working memory span and reading comprehension test are reported in Table 10.

Table 10

Descriptive Statistics for Span and Reading Comprehension Measures

Task	N	<i>M</i>	<i>SD</i>	Median	Range
Reading Span	86	.42	.19	.42	.08 – .92
1-min TIL	88	16.11	3.11	16	8 – 28

Note. N = number participants; *M* = mean; *SD* = standard deviation.

There were no significant differences in working memory span between the four filler groups ($F < .7$), indicating that participants in the four groups had similar working memory abilities. However, the 1-min TIL scores were significantly different between groups [$F(3, 87) = 2.84, p = .04$]. Pairwise comparisons showed that participants in the low constraint strong validity group had a higher mean score on this reading comprehension test than participants in the low constraint weak validity group ($p = .04$). This result was largely attributed to an outlier participant in the low constraint strong validity group that scored more than 3 standard deviations above the mean score⁷. A correlation analysis revealed a significant positive association between working memory span and the 1-min TIL score ($r = .27, p = .01$).

⁷ When this participant is removed differences between groups disappear [$F(3, 86) = 2.14, p = .10$].

3.3.3.2. The Impact of Individual Differences on the Expectancy Effect

To assess the impact of individual differences we computed the magnitude of the expectancy effect for the expected and the second-best words, since both showed a reduced reading time compared to unexpected words. To minimize the influence of different reading speeds across participants, the expectancy effect was calculated for the expected words by subtracting the adjusted reading time of expected words from the adjusted reading time of the unexpected words. A similar procedure was conducted to measure the expectancy effect for the second-best words by subtracting the adjusted reading times of second-best words from the adjusted reading time of the unexpected words. These computations were performed for the target words and for the two words of the spill-over region.

Six separate multiple regression analyses were carried out to estimate the independent contribution of individual abilities on the expectancy effect during the reading of the experimental sentences. In each model, the dependent variable was the magnitude of the expectancy effect for expected or second-best target words, their subsequent first and the second words. In all cases, the working memory span and the 1-min TIL score were entered as factors. Given some missing data on these tasks, the analyses included 85 participants.

The predictors did not have a significant impact on the magnitude of the expectancy effect when the target words were expected (see n at Table 11 & Figure 7) nor for first word following the target words (see $n + 1$ at Table 11 & Figure 7) [n : $R^2 = .01$, ($F(2,82) = 0.39$, $p = .68$); $n + 1$: $R^2 = .02$, ($F(2,82) = 0.71$, $p = .50$)]. In contrast, the model for the second word following the expected target words was marginally significant [$R^2 = .06$ ($F(2,82) = 2.59$, $p = .08$)]. This model explained 6% of the variance of the size of the expectancy effect, with working memory span being a significant

predictor ($p = .05$; see $n + 2$ at Table 11 & Figure 7). This result shows that participants with lower working memory span had an increased expectancy effect in the spill-over region, after expected words were presented.

The models for the magnitude of expectancy effect for second-best words (Table 11 & Figure 8) were not significant for either the target or spill-over regions [n : $R^2 = .02$ ($F(2,82) = 0.90, p = .41$); $n + 1$: R^2 of $.02$ ($F(2,82) = 0.72, p = .49$); $n + 2$: $R^2 = .04$ ($F(2,82) = 1.73, p = .18$)].

Table 11

Standardized Coefficients β for the Multiple Linear Regression Analysis

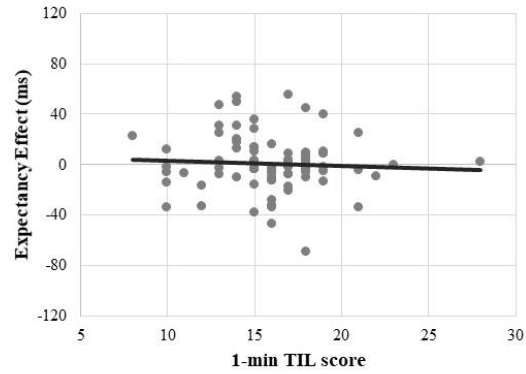
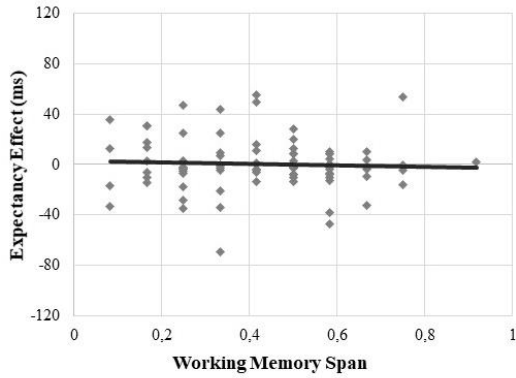
Models	Working Memory Span			1-min TIL score			
	β	t	p	β	t	p	
n	Expectancy effect for expected word	-0.02	-0.16	.87	-0.09	-0.75	.46
	Expectancy effect for SB word	0.07	0.57	.57	-0.16	-1.34	.18
n + 1	Expectancy effect for expected word	-0.08	-0.69	.49	-0.08	-0.65	.52
	Expectancy effect for SB word	-0.13	-1.08	.28	-0.01	-0.09	.93
n + 2	Expectancy effect for expected word	-0.23	-2.01	.05	-0.03	-0.27	.79
	Expectancy effect for SB word	-0.22	-1.86	.07	0.07	0.61	.55

Note. Each row reflects one distinct regression model; SB = Second-best.

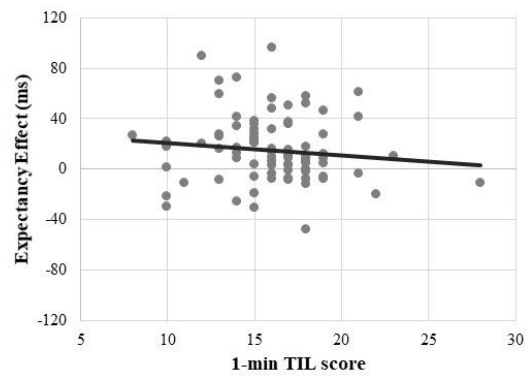
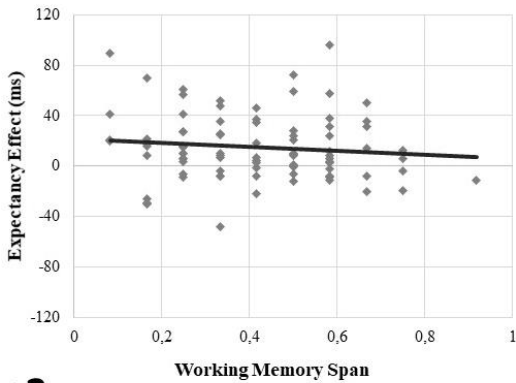
Figure 7

Scatterplots Showing the Relationship Between each Individual Score and the Magnitude of the Expectancy Effect for the Expected words

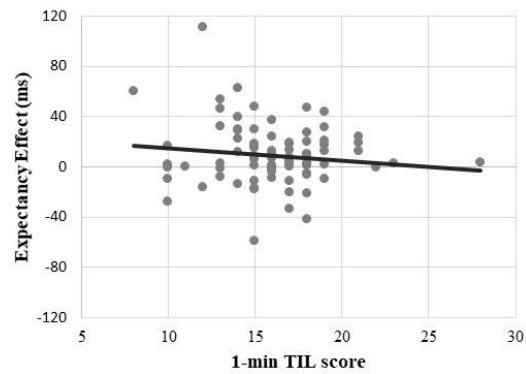
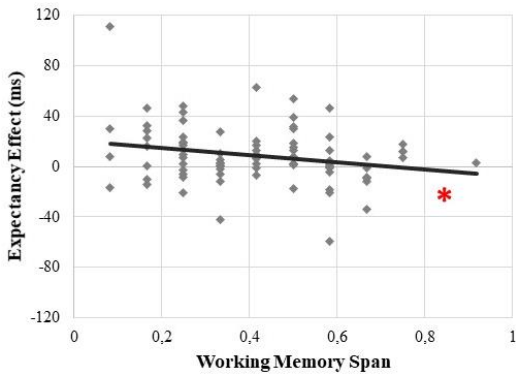
n



n + 1



n + 2

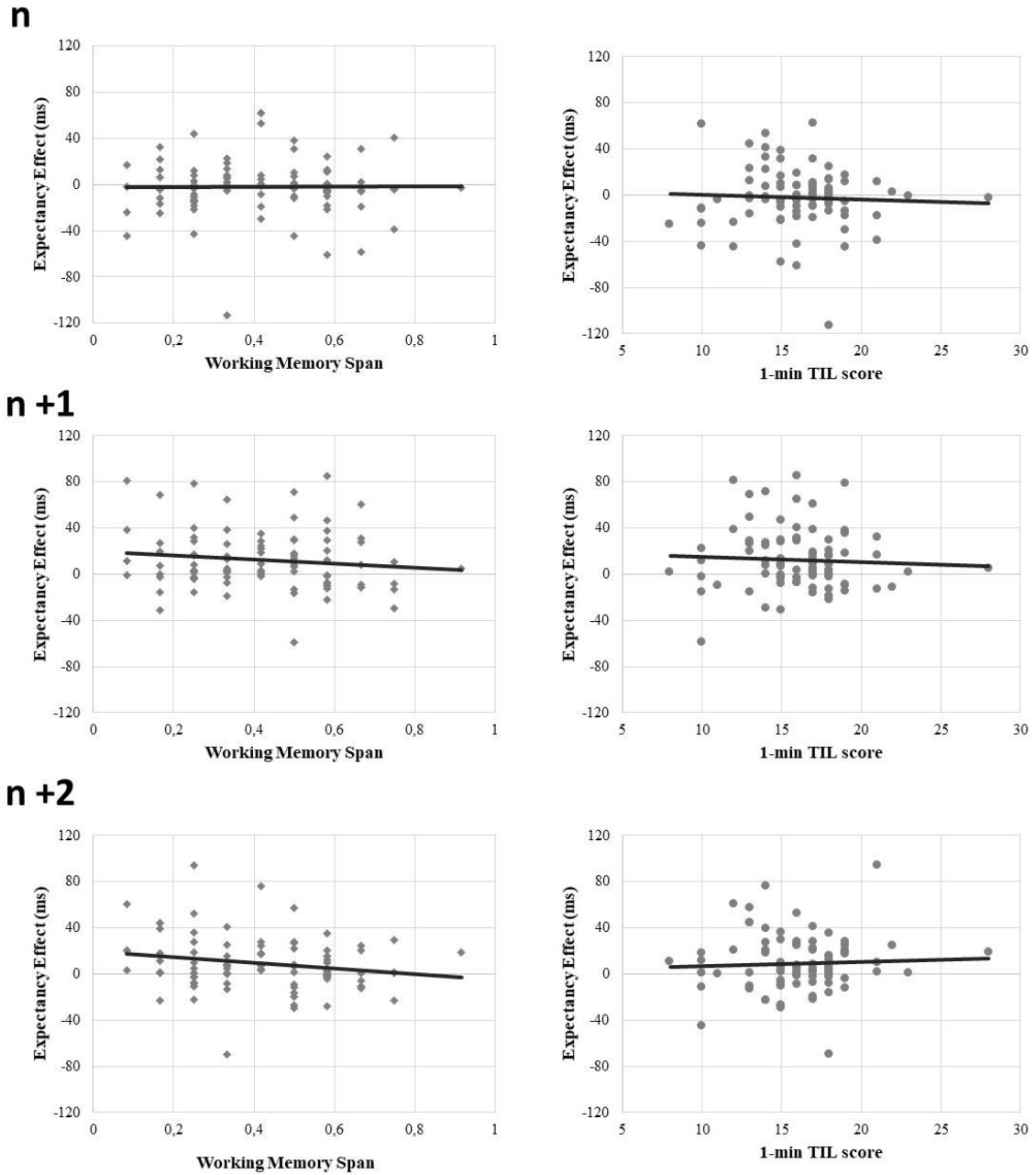


Note. x-axis shows each individual score and y-axis represents magnitude of the expectancy effect for expected words. Lines represent regression fits from the single predictors.

* $p < .05$.

Figure 8

Scatterplots Showing the Relationship Between each Individual Score and the Magnitude of the Expectancy Effect for the Second-Best words



Note. x-axis shows each individual score and y-axis represents magnitude of the expectancy effect for second-best words. Lines represent regression fits from the single predictors.

3.4. Discussion

This study explored the extent to which expectancy effects may arise in words that fit the sentential context but are not the most expected words (i.e., the second-best). By doing so, we aimed to understand the scope of the expectancy effects and inform about the underlying mechanisms of such effects (i.e., word retrieval vs. integration). Moreover, we tested the flexibility of the expectancy effects as a function of task demands and individual differences in cognitive abilities. In line with prior studies, we observed a facilitation effect for expected words, reflected by faster reading times for the words that followed the expected target words compared to words that followed unexpected words. Second-best words also displayed a facilitation effect, as the spill-over words of the second-best targets were read faster than the words following unexpected targets. The task demands, manipulated by the type of fillers presented initially to the readers, did not affect the reading time expectancy effects of the experimental sentences. The individual abilities of the readers, specifically the working memory span, affected to some extent the size of the facilitation effects. In particular, the facilitation effect for expected words, as measured by the reading times of the second word of the spill-over region, was greater for readers with lower working memory span. Reading abilities did not modulate the size of the facilitation effects. Together, these findings attest the pervasiveness and automaticity of the expectancy effect in sentence comprehension.

3.4.1. Anticipatory Word Retrieval vs. Integration

We did not observe expectancy effects in the reading times of the target word (i.e., expected, second-best and unexpected words). In contrast, expectancy of the target words modulated the reading times at the spill-over region. Specifically, the first and the second words that followed an expected target were read faster compared with those that

followed the unexpected target. This facilitation effect is consistent with prior literature (e.g., Hintz et al., 2016; Ng et al., 2017) and suggests that the processing of sentences is easier when a highly expected word is presented, whereas when words are not supported by the previous sentence context, as in the case of unexpected words, there is an increased effort to process those words. The delay in the facilitation effect is in line with some previous studies (Ashby et al., 2005; Hintz et al., 2016).

Interestingly, an expectancy effect was also observed for the sentences completed with second-best words, as the two words following these target second-best words were read faster than the words that followed unexpected targets. Reading times of the spill-over words did not differ between sentences completed with expected and second-best words. These findings demonstrate that the expectancy effect extends to other probable candidates and is not modulated by the degree of expectancy of the probable words. The results are congruent with the integration account that states that all words that are supported by the sentence context are easily integrated (Hagoort, 2005; Zhu et al., 2012). The fact that facilitation effects only emerged at a delayed moment, in the spill-over region, also points towards the view that such facilitation is associated with a later stage of word processing, as is the case of word integration.

The results argue against the hypothesis that the expectancy effects observed in self-paced reading tasks are associated with early anticipatory word retrieval. If readers had been able to anticipate the (most) expected candidate, facilitation would have occurred earlier at the target words. Additionally, the similar facilitation effect observed for expected words and second-best words is not compatible with the predictive accounts. On the one hand, the serial graded proposal postulates that only the most expected word is initially pre-activated (Thornhill & Van Petten, 2012), thus the expectancy effect should only be triggered by the most expected word. On the other hand, the parallel

account posits that the degree of expectancy modulates the pre-activation of all probable candidates (DeLong et al., 2005), in which case the expectancy effect should have been stronger for the most expected than second-best words. Neither of these hypotheses were corroborated by the present findings.

The response to the comprehension question substantiated the results from the reading times. A facilitation effect was observed in response times, since participants were faster in answering questions about sentences completed with expected and second-best words than unexpected words. Accuracy was also affected by word expectancy, with more accurate responses to questions about sentences completed with expected than second-best or unexpected words. These findings indicate that not only the reading times of spill-over words were affected by the word expectancy, but also the participant responses to comprehension questions in the end of each sentence.

3.4.2. Strategic vs. Automatic Processes

Different sets of filler sentences, presented in the beginning of the session before the experimental trials, were used as a way to inspect the role of the task demands upon the expectancy effect. Results showed that reading times did not differ across sets: neither the validity of the predictions nor the level of context constraint of the initial set of sentences influenced the processing of the experimental sentences. Thus, sentence processing and word expectancy effects did not depend on the task demands or the reader's strategy.

Anticipating words during sentence comprehension may lead to a processing cost if the upcoming words differ from the predicted words (Federmeier et al., 2007; Kuperberg & Jaeger, 2016; Thornhill & Van Petten, 2012). Thus, when readers are presented with a high number of sentences completed with an unexpected word it would be beneficial to suppress or rely less on anticipatory retrieval mechanisms. A similar

process may be present when readers are exposed to a high proportion of sentences with low context constraint, since for these sentences, readers may be less confident on which word to expect and there is a higher probability that the upcoming word is different word from the anticipated one. The similar reading times that was observed across validity prediction and contextual constraint of fillers argues against the proposal that the linguistic processes can be adjusted according with the task demands (or even according to the broad context) to optimize reading. Our results contrast with those reported by Brothers et al. (2017), who used a similar task and also manipulated the prediction validity of filler sentences. The authors found an enhanced facilitation effect for highly expected words when the preceding sentences were completed with expected words (strong validity set) than when completed with unexpected words (weak validity set). The inconsistency found between our and Brothers' studies can eventually be attributed to differences in the number of filler sentences and in the degree of prediction validity. In their study, participants were exposed to 180 filler sentences relative to 90 fillers used in our task. Moreover, in the strong validity group, 87.5% of the sentences were completed with expected word (100% of fillers + 50% of experimental sentences), while for the weak validity group only 12.5% of the sentences were completed with expected words (50% of experimental sentences). In our study, for the strong validity groups 66.6% of sentences were completed with expected words (100% of fillers + 33.3% of experimental sentences), while for the weak validity groups, 22.2% of the sentences included expected words (10% of fillers + 33.3% experimental sentences). Importantly, since we manipulated the degree of the target words' expectancy in three levels, we had an additional type of experimental sentences (i.e., the second-best). These methodological changes may have diminished the differences between the groups or may have weakened the need to adapt the reading processes. Furthermore, since the expectancy effects

observed in our study only emerged for the spill-over words, this delayed effect may be less sensible to changes on the weight of the anticipatory retrieval mechanism - the process suggested to be sensitive to task demands (Brothers et al., 2017; Hintz et al., 2016). Therefore, the task demand modulation of the expectancy effects may only occur in extreme settings, namely when a higher proportion of sentences are biased towards an unexpected word.

3.4.3. Individual Differences

The regression analyses showed that working memory span marginally affected the magnitude of the expectancy effect. Specifically, readers with lower working memory span showed an increased expectancy effect, but only for the second word following the most expected word. Also, this effect did not extend to second-best words. This result is incongruent with previous findings, which have reported that participants with higher working memory capacity processed expected words faster and more accurately (Estevez & Calvo, 2000; Janse & Jesse, 2014). It should be noted that in prior studies the tasks were more complex, involving two types of information, e.g., visual and auditory (e.g., Huettig & Janse, 2016), or different processes, e.g., reading and naming (Estevez & Calvo, 2000). Those tasks are more demanding and require additional efforts which may stress the role of working memory. In contrast, in our task there were only visual stimuli and participants performed a simple reading for comprehension task. An earlier EEG study with written stories found that readers with lower working memory capacity handled words distinctively in a later stage of word processing (Otten & Van Berkum, 2009). All the participants, independently of their working memory span, showed an initial facilitation effect for the expected words, yet those with lower working memory capacity engaged additional neural responses in a later stage of word processing. Thus, our findings may reflect an additional and late process recruited by readers with lower

working memory capacity. This hypothesis should be considered with caution as our findings were restricted and only marginally significant, and we cannot determine unequivocally that such process is occurring. Hence, more research is necessary to explore this interpretation.

Our results revealed that reading abilities did not affect the magnitude of the expectancy effect. The large variability on the scores obtained in the 1-min TIL test (ranging from 8 to 28) confirms that the test successfully differentiated participants' reading fluency, which is consistent with prior reports (Fernandes et al., 2017). Yet, this test was designed to evaluate reading age. In our study, participants were all college students and therefore their reading abilities were overall high. Contrastingly, prior studies that have found an impact of reading abilities on language performance have compared higher-literate *vs.* lower-literate participants (Mishra et al., 2012; Ng et al., 2017). So, their less skilled readers had probably a lower reading capacity and less years of formal education than our sample.

To conclude, our findings do not provide evidence for a consistent and prominent role of working memory span or reading abilities in processing expected and unexpected words. They instead demonstrate that the expectancy effects extend to all readers in a similar way, endorsing the strength and automaticity of such effects.

3.4.4. Limitations and Future Studies

The self-paced moving window has been widely used to explore various questions on language processing, such as syntactic ambiguities (Dussias, 2003; Trueswell & Kim, 1998), distance dependency (Crain & Fodor, 1985; Nicol, Forster, & Veres, 1997), and expectancy effects (e.g., Brothers et al., 2017; Ng et al., 2017). Yet, presenting sentences word-by-word is a less ecological approach that may lead to unnatural effects, such as a tendency towards highly incremental processing. Word-by-word presentation prevents

readers to do regressions during reading, i.e., go back and read again some words, which is a typical behaviour during natural reading. Additionally, repeatedly pressing a button while reading can lead to longer reading times or delayed processing effects that can spill over into the next word (Jegerski, 2014; Morris, 1994). Indeed, in our study the expectancy effects were only observed at the spill-over words, that we interpreted as being associated with the transfer of the processing benefit/cost of one word to the following one. However, those reading times are also affected by the lexical properties of the spill-over words. Moreover, reading times are not a pure or direct measure of the reading process as they are affected by additional factors, such as the motor action.

Electrophysiological and eye-tracking measures would provide more precise information about the online processes associated with reading and comprehending more or less expected sentences. These methodologies provide fine-grained temporal resolution and do not require engagement in motor actions (e.g., button press) while reading. These measures may therefore provide a clearer and more precise understanding of the cognitive processes that underlie expectancy effects, which could inform anticipatory retrieval mechanisms.

3.5. Conclusion

Expectancy effects were observed for all probable candidates and the magnitude of the effect was not modulated by the degree of expectationity of the word. This facilitation effect emerged at the spill-over region, i.e., for the two words that followed the target word, and in the response times for the comprehension questions. The findings collectively provide support for an integration account of expectancy effects. Moreover, expectancy effects were robust and widespread as they were not significantly affected by

task demands nor individual differences. We conclude that expectancy effects are ubiquitous in sentence comprehension.

4. DIFFERENCES IN CONTEXT FACILITATION EFFECT FOR THE MOST EXPECTED AND THE SECOND-BEST WORD: EVIDENCE FROM EVENT-RELATED BRAIN POTENTIALS

4.1. Introduction

When hearing a joke, we are often surprised by the punch-line, whereas when listening to a story we can on many occasions guess what is coming next. This may occur because a story or a sentence embeds contextual information that may allow the anticipation of the upcoming words.

Research has shown that there is facilitation to the processing of a contextually-supported word (e.g., “She cleaned the dirt from her SHOES”). Notably, naming is faster (e.g., Stanovich & West, 1983), response times are quicker (e.g., Forster, 1981) and the total fixation time is shorter (e.g., Frisson, Harvey, Drieghe, & Staub, 2017; Rayner & Well, 1996) for expected words in sentences with a supporting context than the same words in sentences that do not provide a contextual support (e.g., “They said it was the SHOES”). Similar results have been found for expected words relative to surprising words (e.g., Duffy, Henderson, & Morris, 1989; Fischler & Bloom, 1979; Rayner et al., 2011; Simpson et al., 1989; Stanovich & West, 1981; West & Stanovich, 1978), which may be anomalous words (i.e., words that are syntactically but not semantically appropriate, e.g., “She cleaned the dirt from her TERMS”) or unexpected words (i.e., syntactically and semantically appropriate words, but are unlikely to appear in the sentence, e.g., “She cleaned the dirt from her BOAT”). Initially, this facilitation was explained by an integration process, whereby expected words were more easily integrated into the sentence meaning relative to unexpected words (e.g., Hagoort et al., 2004; Jackendoff, 2007). Recently researchers instead argue that this facilitation is attributed to

predictive mechanisms that pre-activate the expected words or some aspect thereof (e.g., Federmeier, 2007; Huettig, 2015; Kuperberg & Jaeger, 2016).

Despite the intense research in this area, it is still unclear how anticipatory processes in language comprehension are implemented (Kuperberg & Jaeger, 2016; Wlotko & Federmeier, 2007). In the present study, we addressed two main questions. The first concerned the number of predicted candidates: (1) only the most expected word is anticipated, as proposed by the serial graded process models, or instead (2) if all potential candidates can be predicted to some degree, as postulated by the probabilistic parallel process models. The second question addressed the nature of the increased demands required for processing unexpected words in sentences in which the context strongly points towards a specific expected word. We aimed to disentangle whether such increased cognitive demands are due to an interference effect between the activation of the unexpected word and the pre-activation of the expected word that must be inhibited or, alternatively, are associated to an increased effort to integrate the unexpected word into the sentence context to form a new coherent whole.

4.1.1. Predictive Mechanisms and the N400 Component

Electroencephalography (EEG) studies have demonstrated that the facilitation associated with expected words initiates within a few hundred milliseconds of their onset. Research has shown an amplitude reduction that peaks around 400ms when reading expected vs. unexpected words (e.g., Kutas & Federmeier, 2000; Kutas & Hillyard, 1980; Kutas, 1993; van Petten, 1993; van Petten, Rubin, Parks, Plante, & Coulson, 2000). This component has been termed the N400, and it is characterized by a broad negative deflection of the ERP that starts 200-300ms after a word is presented. For sentences presented visually it tends to have a centroparietal scalp distribution, with a small but

consistent bias towards the right hemisphere (Kutas & Federmeier, 2011; Lau, Phillips, & Poeppel, 2008, for revision).

In sentence comprehension studies the N400 component has consistently been pointed out as a measure of semantic processing, which is influenced by the relationship of the stimulus to its preceding context (e.g., Federmeier, McLennan, Ochoa, & Kutas, 2002; Kutas & Hillyard, 1980; Wlotko & Federmeier, 2012). Some authors have suggested that this component may reflect the semantic unification that takes place during sentence comprehension, i.e., the process by which small pieces of word-level information are combined into a coherent whole message-level representation (Hagoort, 2005; Hagoort et al., 2009; Hagoort & Indefrey, 2014; Zhu et al., 2012). According to this account, the reduced N400 for expected relative to unexpected words occurs because they are easier to integrate, as they receive more support from the preceding context. Previous studies corroborate this proposal by showing that the degree of sentential constraint affects the amplitude of the N400. Specifically, in high constraint sentences (i.e., sentences that strongly support the expected word), the reduction of N400 amplitude is greater than in weak constraint sentences (i.e., when the sentential context is less supportive and can be completed with a vast number of words; e.g., DeLong et al., 2005; Federmeier et al., 2007; Kutas & Hillyard, 1984; Wlotko & Federmeier, 2012a, 2012b). However, in these studies, for sentences with a weaker context constraint, the most expected words had an overall lower expectancy than the expected words in sentences with a high constraint context, which allows alternative accounts to explain which cognitive mechanisms underlie this ERP component.

Some authors have argued that the facilitation for expected words is driven by the fact that readers can use the sentence context to predict what is coming next (e.g., Federmeier et al., 2007; Kuperberg & Jaeger, 2016; Kutas & Federmeier, 2011; Kutas,

Van Petten, & Kluender, 2006; Lau et al., 2008; Van Berkum, 2009; Wicha et al., 2004). High constraining contexts promote the pre-activation of relevant lexical forms or their associated conceptual features. In the latter case, the N400 would reflect the activation of features in long-term memory that are associated with the predicted lexical item (Federmeier, 2007; Lau et al., 2008). Supporting this view, EEG studies have found facilitation effects for unexpected words that share semantic features with the expected words. For example, Federmeier and Kutas (1999) manipulated the semantic relationship between the unexpected and expected word in sentences like “They wanted to make the hotel look more like a tropical resort. So along the driveway, they planted rows of PALMS/PINES/TULIPS.” The results revealed a reduced amplitude of N400 for unexpected words that belong to the same category of the expected words [e.g., PINES vs. PALMS (trees)] compared with unexpected words that belong to a different category [e.g., TULIPS vs. PALMS (flowers vs. trees)]. Similar findings were reported for unexpected words that have some orthographic and phonologic overlap with the expected words (e.g., HOOK vs. BOOK) compared with unexpected words with no overlap (e.g., SOFA vs. BOOK; DeLong et al., 2019; Ito et al., 2016; Laszlo & Federmeier, 2009). Together, these findings indicate that some features (semantic, orthographic, phonological) of the expected words are rapidly accessed which may be due to their pre-activation prior to the presentation of the target word.

To directly test the extent to which expected words can be anticipated, other studies have investigated if facilitation effects are present before the appearance of the expected words. In an EEG study, DeLong and collaborators (2005) explored the processing of indefinite articles – ‘a’ or ‘an’ – when the subsequent expected noun starts with either a consonant or with a vowel. They found larger N400 responses (i.e., more negative) to indefinite articles that mismatched the expected upcoming noun (e.g., “The

day was breezy, so the boy went outside to fly an...” where the word ‘kite’ is the most expected). Other studies have looked at the processing of gender-marked articles, gender-marked adjectives and classifiers presented before the critical noun and also reported differential ERP effects for these preceding words when they were congruent *vs.* incongruent with the most expected words (Kwon, Sturt, & Liu, 2017; Martin et al., 2013; Szewczyk & Schriefers, 2013; Van Berkum et al., 2005; Wicha et al., 2004). These results further support the predictive mechanism in sentence comprehension as they demonstrate that even before the appearance of the expected word the readers had anticipated a specific word to complete the sentence. However, these results should be considered with some caution as there are some inconsistencies regarding the ERP components associated with the facilitation effect at preceding words, and some studies have found that not all features are equally predicted (Nieuwland et al., 2018, for recent discussion).

Currently, most researchers in the field assume that some features and information can be anticipated prior to encountering the word, particularly in the case of sentences with a highly constraining context. These mechanisms may allow the reader to optimize sentence comprehension, for instance leading to faster reading times and to a more economic consumption of resources (Huettig & Mani, 2016; Kuperberg & Jaeger, 2016, for discussion review). Yet, how this process occurs is still debated. Some authors have proposed that prediction occurs by a serial graded process, *i.e.*, readers can initially predict the most expected word, and only if this prediction is disconfirmed then the system can update the predictions towards other probable candidates (Thornhill & Van Petten, 2012). Alternatively, it has been postulated that prediction is a probabilistic parallel process in which multiple possibilities are considered at the same time, *i.e.*, readers compute and pre-activate at any given time all probable candidates. The level of activation of each of these candidates will reflect their degree of expectancy in that

sentence context (e.g., DeLong, Urbach, & Kutas, 2005). Results so far do not disentangle which of these accounts underlie the predictive mechanisms that give rise to the facilitation effects.

4.1.2. Inhibition/Reinterpretation and the PNP Component

If during sentence comprehension readers can predict which word is coming, when such predictions are disconfirmed (i.e., when instead of the expected word, an unexpected word appears), it may entail costs of inhibiting or suppressing the pre-activated candidates. Some evidences have been found to corroborate this hypothesis, namely the longer response time found for unexpected words when presented in high constraint sentences compared with neutral sentences that do not provide a contextual support (e.g., Schwanenflugel & LaCount, 1988; Schwanenflugel & Shoben, 1985). These results cannot be explained only by an enhanced effort to access these words, since in both cases there is no support of the preceding context. Therefore, those findings could indicate that there is an interference effect between the pre-activated word (i.e., the expected word) and the unexpected word that was instead presented. However, those effects have been reported inconsistently in the literature, since other behavioural studies, using the same or a different experimental task, have not found any difference between processing unexpected words at different contexts (e.g., Stanovich & West, 1981; Traxler & Foss, 2000). Additionally, eye-tacking studies have also found mixed results. Some have reported longer fixation time and higher likelihood of regression saccades for unexpected words compared with expected word (e.g., Staub, 2011), while others have not found any evidence of cognitive cost in the processing of unexpected words (e.g., Frisson et al., 2017; Luke & Christianson, 2016; Staub, 2015, for revision).

In the EEG literature, some studies have provided evidence that high constraint sentences completed with unexpected words (e.g., “He was afraid that the drugs would

damage his REPUTATION”, instead of the most expected word ‘BRAIN’⁸) evoke a left anterior late positivity (e.g., Chow et al., 2018; Delong et al., 2014; Federmeier et al., 2007; Martin et al., 2013). This ERP component emerges after the N400, commonly between 500-900ms, and has been designated as post-N400 positivity (PNP). Some authors have argued that this component reflects the processes that are triggered when strong predictions are disconfirmed, such as suppression or inhibition of the predicted word (Federmeier et al., 2007; Thornhill & Van Petten, 2012). However, only a modest-sized literature has reported this late frontal positivity (van Petten & Luka, 2012, for a discussion review) and there are some inconsistencies regarding the conditions under which the PNP is evoked. Namely, some studies have reported a PNP component for sentences with weak or moderately constraining contexts (Brothers et al., 2015; Federmeier & Kutas, 2005), whereas others have only found it for highly constraining sentences (Federmeier et al., 2007). Additionally, one study has reported an increased positivity for both high and low constraint sentences completed with unexpected words and also for low constraint sentences completed with expected words. The only condition that has not elicited the PNP was the high constraint sentences completed with the expected words (Thornhill & Van Petten, 2012). Therefore, it is not clear whether the PNP only occurs when a strong prediction is disconfirmed in which case it may reflect the suppression or inhibition of the pre-activated word (Brothers et al., 2015; Federmeier et al., 2007), or if it occurs when the word is not supported by the previous context in which case it would denote an increased effort to integrate and (re)interpret the whole sentence (Thornhill & Van Petten, 2012).

⁸ Examples from Thornhill & van Petten (2012).

4.1.3. The Current Study

The present study aims to clarify what expected words are pre-activated when a sentence unfolds. More specifically, we aim to contrast the serial graded hypothesis, which suggests that initially only the most expected word can be anticipated, with the probabilistic parallel hypothesis that proposes that all the probable candidates can be pre-activated. Moreover, we address the question of how such pre-activation affects the processing of unexpected words, i.e., when predictions are disconfirmed. To experimentally explore these questions, we investigated not only the processing of expected and unexpected words, as it has been done in previous studies, but also the processing of the second-best candidate, i.e., the second most expected word in a sentence. For instance, in the sentence “The dog spent the afternoon chewing the”, the most expected word is ‘bones’, the second most expected word, second-best, is ‘shoes’, and an unexpected word is ‘glasses’(Bloom & Fischler, 1980). Critically, the three words are plausible completions for the same sentence but have different levels of expectancy (Expected > Second-Best > Unexpected). To our knowledge this EEG study is the first to present for the same sentence two expected words, the most expected and the second-best word. The most expected words are overall moderately expected (as the sentences do not have a high constraint context otherwise there would not be more than one expected candidate) while the second-best words are more weakly expected. Previous studies have reported an amplitude reduction of the N400 for both moderately and weakly expected words (DeLong et al., 2005; Federmeier et al., 2007; Kutas & Hillyard, 1984; Thornhill & Van Petten, 2012; Wlotko & Federmeier, 2012b). The effect is graded according to the degree of expectancy, such that the differences in magnitude are larger for the moderately expected words than for the weakly expected words (when compared with unexpected words). Nevertheless, these differences are significant and consistent for both types of

expected words. Critically, in these studies, both the moderately and the weakly expected words were the most expected words in a given sentence (e.g., “George could not believe his son stole a CAR” vs. “There was nothing wrong with the CAR”⁹). It was the sentential context, that was either more or less constrained, that drove the expectancy effects. It remains unknown if an expected word that is not the most expected one will also lead to a facilitation effect.

Exploring the processing of the second-best word allows us to disentangle whether the expected words are predicted in a serial or in a parallel way. The serial graded proposal suggests that in an early processing stage there should be no facilitation effect for the second-best word, as only the most expected word is being pre-activated. Therefore, the N400 amplitude should be reduced (i.e., less negative) in response to the most expected words relative to the second-best words, with similar N400 amplitudes for second-best and unexpected words, since both at that stage are unexpected. If the prediction is disconfirmed, since the word used to complete the sentence is not the most expected, the system could shift towards another probable candidate. This might lead to a beneficial impact in the processing of the second-best word, but only in a second moment. Therefore, there may be delayed facilitation effect for second-best compared with the expected words, i.e., the N400 amplitude reduction could occur in a later time-window.

Conversely, the parallel probabilistic account suggests that the processing of the second-best word should be immediately facilitated since all probable candidates are pre-activated. Yet, the effect should be of smaller magnitude relative to the expected words, since those words are less probable. Specifically, the N400 amplitude should reflect the level of expectancy of the critical words, thus we should find a graded amplitude increase of the N400 from expected to second-best to unexpected words (Expected < Second-Best

⁹ Examples from Bloom & Fischler (1980).

< Unexpected). Additionally, this effect should be similar across the all-time course of the N400, with similar onset latency for both expected and second-best words.

To clarify which cognitive mechanisms underlie the processing of unexpected words in moderately constrained sentences, we also explored the late positivity component (PNP). Serial and parallel prediction accounts postulate distinct hypothesis regarding the conditions that elicit an increased positivity, as well as the cognitive processes associated with this ERP component. According to the serial graded proposal, the PNP would be evoked by the second-best and unexpected words, due to the initial commitment towards the most expected word, which in turn would induce the suppression or inhibition of the (wrongly) pre-activated word (i.e., most expected word). This result would support the view that the PNP component reflects inhibition processes rather than integration difficulties or sentence re-interpretation. According to the parallel proposal, only the unexpected words should evoke the PNP response. At this stage of processing (i.e., in a later time window), both expected and second-best should have already been integrated, since both had been pre-activated, and, thus the PNP should only emerge for the unexpected words. This result would be consistent with the view that the PNP denotes the difficulty of integration and possibly the need to re-interpret the general meaning or context scenario of the sentence, as the unexpected words often change the whole-sentence meaning.

4.2. Method

4.2.1. Participants

Thirty participants (18 females, $M = 22.6$ years, $SD = 6.12$) took part in this study. Data from six additional participants were removed from the analysis – four had a high number of trials with artefacts (more than 50% in at least one condition) and the other

two due to technical problems during the EEG registration. All participants were recruited from Universidade de Lisboa and the surrounding community. They were all native speakers of European Portuguese and had no history of neurological impairment or reading disorder. They provided written consent to the experimental procedure, which was approved by the ethics committee of FPUL. Participants received a compensation for their participation (either 10€ voucher or a course credit).

4.2.2. Material

Two hundred and seventy sentences were selected from a pool of 806 sentences that were pre-tested in a cloze probability procedure (see details in Chapter 2). All the sentences were high constraint (see Table 12 for examples) which means that they have a strong most expected word ($CP = .61$, $SD = .16$).

Table 12

Examples of Sentences per Set and Target Words

Sentence Frame	Number of words		Ending Word		
	<i>M</i>	<i>SD</i>	Exp	SB	Unex
Set I					
“O cão passou a tarde a roer os” (The dog spent the afternoon chewing the)	9.44	1.35	ossos (bones)	sapatos (shoes)	óculos (glasses)
Set II					
“O Tiago mal chegou a casa tirou os” (Tiago, when he got home, took off his)	9.56	1.53	sapatos (shoes)	–	–
Set III					
“A avó vai sempre ao mercado comprar os” (Grandmother always goes to the market to buy the)	9.43	1.45	–	–	sapatos (shoes)

Note. *M* = mean; *SD* = standard deviation; Exp = Expected; SB = Second-best; Unex = Unexpected

Ninety of those sentences, labelled Set I, could be presented with their most expected word ($CP = .61$, $SD = .12$, range: .41 - .85), their second most expected word (i.e., second-best; $CP = .19$, $SD = .05$, range: .12 - .29) or an unexpected word ($CP = 0$, $SD = .01$, range: 0 - .04). The unexpected words were not produced by the participants in the pre-test yet were semantically congruent with the sentences. For example, the sentence “O cão passou a tarde a roer os...” could be presented with the most expected word ‘ossos’ (Expected condition), with the second-best word ‘sapatos’ (Second-best condition) or with the unexpected word ‘óculos’ (Unexpected condition). Thus, the sentences from Set I were presented in one of the three experimental conditions (Expected, Second-Best and Unexpected) with the replacement of the target word. Those target words were all nouns and were matched for various psycholinguistic parameters (see Table 13) obtained from the P-Pal database (Soares et al., 2018), including word frequency ($F < .1$), length ($F < 1.5$), orthographic and phonological neighbours ($F < 1$ in both cases).

Table 13

Means and Standard Deviations of the Lexical Characteristics of the Target Word of the Sentences from the Set I in the Three Experimental Conditions

Target Word	Word		Word Length		Orthographic neighbours		Phonological neighbours	
	Frequency ^a							
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Expected	1.37	0.64	6.34	1.80	5.30	5.62	4.97	5.10
Second-best	1.32	0.59	6.12	1.87	4.52	5.41	4.32	5.01
Unexpected	1.27	0.69	6.57	1.82	4.37	5.21	4.73	5.79

Note. *M* = mean; *SD* = standard deviation

^a Log-transformed word frequency.

To ensure that the same target words were presented in the three experimental conditions, the ninety second-best words from Set I were also presented in a sentential frame where they were the most expected word (Set II) and in another sentential frame where they were an unexpected word (Set III). In the ninety sentences from Set II those words were their most expected words ($CP = .61$, $SD = .15$, range: .32 - .90). For instance, on Set II the target word ‘shoes’ which was the second-best in the example above, appeared as the most expected word in the sentence “Tiago, when he got home, took off his”. In the sentences from Set III those words were their unexpected completions ($CP = 0$, $SD = .01$, range: 0 - .05). For example, in the sentence frame “Grandmother always goes to the market to buy the” the unexpected word selected was ‘shoes’ (from the pool of second-best words).

The three sets of sentences were matched in cloze probability towards the most expected word ($F < 1$) and in the number of words ($F < 1$; see Table 13). To ensure that each participant saw each sentence and ending word only once, we created four lists containing 45 sentences from each condition (Expected condition: 22 sentences from Set I + 23 from Set II; Second-Best condition: 45 sentences from Set I; Unexpected condition: 23 sentences from Set I + 22 from Set III). Each participant saw one experimental list, with the four lists evenly distributed across participants.

4.2.3. Procedure

Each trial began with a fixation cross presented for 500ms in the centre of the screen. The sentence was then presented word by word, with durations of 200ms per word and 300ms inter-word intervals. The order of sentence presentation was pseudo-randomized, so that there were always less than 3 sentences of each condition appearing in sequence. To ensure attentive reading, participants were asked, 1000ms after the ending word of the sentence was shown, to judge whether a probe word had appeared in the

preceding sentence. Probes were displayed for 1500ms and during this period participants had to press a key with the right index finger if that word was presented (i.e., Old) and another key with the left index finger if that word did not appear in the sentence (i.e., New). Half of the probe words were selected from the immediately preceding sentence and half were selected randomly from other stimuli sentences. Probes were content words (noun, verbs, adjectives, adverbs) of the presented sentences, but were never the ending word. The new trial started after a period for blinking that lasted for 1500ms. Presentation software (version 18.0, Neurobehavioral Systems, Inc., Berkeley, CA) was used to display the stimuli on a computer screen and to record behavioural responses.

Participants were instructed to avoid eye blinks and body movements during the presentation of the sentences. Before the experimental session started, they were presented with nine practice trials to familiarise with the task. The main experimental session was divided into five blocks and between blocks there were brief resting periods. The order of block presentation was counterbalanced between participants. The experimental session, including the set-up time, lasted on average ninety minutes.

After the recording session ended, participants provided plausibility ratings for each of the previously presented sentences, to guarantee that the sentences used were not considered implausible. They were instructed to rate the plausibility of each sentence using a 5-point scale (1= completely implausible to 5= completely plausible).

4.2.4. EEG Data Acquisition and Pre-processing

Electroencephalogram (EEG) was recorded through an ActiveTwo Biosemi electrode system from 64 Ag/AgCl active scalp electrodes, mounted in an elastic cap (for further details see <http://www.biosemi.com>; BioSemi, Amsterdam, The Netherlands). EEG was continuously sampled at 2048Hz, with a bandpass of 0.01-100Hz, and stored for later analysis. Additionally, two electrodes were placed at the left and right temples

(horizontal electrooculogram: EOG) and one below the left eye (vertical EOG) to monitor horizontal and vertical eye movements, and two electrodes were placed on left and right mastoids for offline reference.

EEG data were pre-processed using EEGLAB v14.1.1 (Delorme & Makeig, 2004), with supplementary plugins: ERPLab (Lopez-Calderon & Luck, 2014), ADJUST (Mognon, Jovicich, & Bruzzone, 2011) and CleanLine. Data was down sampled to 512Hz, referenced offline to the average of the left and right mastoids, removed 50HZ noise and high-pass filtered with a 0.1 Hz filter. Data from individual channels that were consistently bad for a given subject were replaced using a nearest-neighbour interpolation. The average number of replaced channels was 0.67 (range = 0 – 2). We ran an independent component analysis (ICA) and used ADJUST plugin to identify and correct noise and artefacts (e.g., blinks) within the raw EEG data. This procedure diminishes experimenter bias in these pre-processing steps. Individual epochs were created for each target word with 200ms pre-stimulus baseline and 1000ms epoch after the onset the word onset. A final round of semi-automatic artifact rejection with a threshold of $\pm 100\mu\text{V}$ was used to remove any remaining artifacts Following artefact rejection, ERP averages were based on at least 70% of the trials of each condition per participant. The number of trials did not differ between conditions [$F < 1$; Expected = 42.37 (3.0), Second-best = 41.93 (3.26), Unexpected = 42.23 (3.0)].

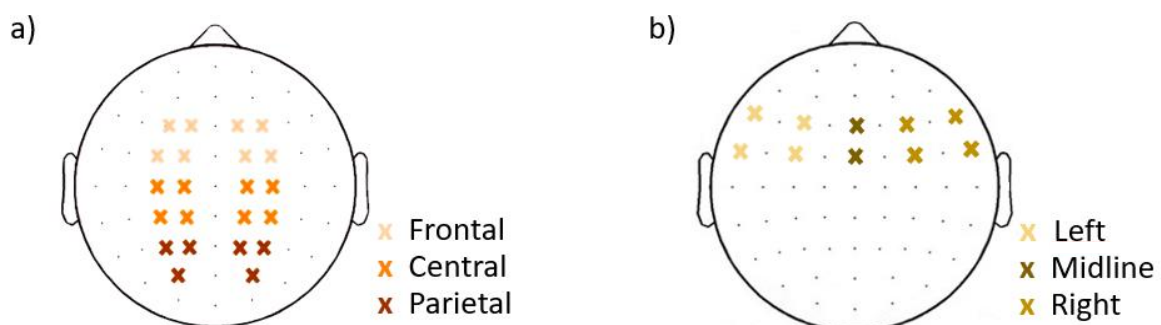
4.2.5. ERP Analyses

Trials were averaged for each condition and each participant forming the ERPs. Following previous studies (e.g., Boudewyn, Gordon, Long, Polse, & Swaab, 2012; Coco, Araujo, & Petersson, 2017; Thornhill & Van Petten, 2012) N400 amplitude was measured as mean amplitude in three-time windows: 300-500ms (typical window), 300-400ms (earlier window) and 400-500ms (posterior window). Repeated-measures

ANOVAs were conducted for each time-window considering Target Word (expected *vs.* second-best *vs.* unexpected), Region (frontal *vs.* central *vs.* parietal) and Hemisphere (left *vs.* right) as within-subject factors. The topographic factors considered six regions of interest (ROIs): left-frontal: F1, F3, FC1, FC3; right-frontal: F2, F4, FC2, FC4; left-central: C1, C3, CP1, CP3; right-central: C2, C4, CP2, CP4; left-parietal: P1, P3, PO3; right-parietal: P2, P4, PO4 (see Figure 9a), in order to reduce the number of comparisons and the familywise error rate (see Luck, 2014). The selection of the electrodes to compute the average amplitude in the ROI was created considering the electrodes usually used in the literature (e.g., Brothers et al., 2015; Comesaña et al., 2012; Martin et al., 2013; Pinheiro et al., 2013; Thornhill & Van Petten, 2012). Additionally, the onset latencies were measured to test if there were differences in the time of the rise of this ERP component between conditions, using a similar repeated-measures ANOVA. The onset latencies were determined by calculating a 50% peak latency measure for each subject between 300 and 500ms for each of those selected electrodes.

Figure 9

Selection of Electrodes to Create the Nine ROIs



Note. a) Six regions of interest to explore the N400 (i.e., Frontal, Central, Parietal x Left, Right).

b) Three regions of interest to explore the PNP (i.e., Anterior Left, Anterior Midline, Anterior Right).

To explore the PNP component we computed the mean average voltage amplitudes for two time windows: 450-650ms and 700-900ms. We conducted repeated-measures ANOVA on time-window averaged ERPs at 10 electrodes in the anterior region of the scalp. The factors in these analyses were Ending Word (expected *vs.* second-best *vs.* unexpected) and Laterality (left *vs.* midline *vs.* right). The topographic factors effectively defined three ROIs: anterior-left: F3, F7, FC3, FT7; anterior-midline: Fz, FCz; anterior-right: F4, F8, FC4, FT8 (see Figure 9b).

For all tests with more than one degree of freedom in the numerator, *p*-values were adjusted with the Huynh-Feldt correction for violation of sphericity. Significant effects ($p < .05$) were followed by pairwise comparisons, with Bonferroni correction. All statistical analyses were conducted using IBM SPSS 25.0 software (SPSS, Corp., USA).

4.3. Results

4.3.1. Behavioural Results

4.3.1.1 Probe Recognition

Overall accuracy in the post-sentence probe recognition task was .98 ($SD = .03$), indicating that participants were reading the sentences attentively (see Table 14). Separate ANOVAs were carried out on the proportion of correct responses and response times (RTs) for correct trials. A repeated-measures ANOVA with Probe (Old, New) and Target Word (Expected, Second-best, Unexpected) showed a main effect of Probe [$F(1,29) = 12.19, p = .002, \eta_p^2 = .296$], as participants were more accurate in identifying a word as new compared with recognizing a word as old ($M = .99$ and $M = .98$, respectively). There was no significant effect of Target Word and no interaction between probe and ending word ($p > .05$ in both cases). The same analysis performed on RTs did not reveal any significant differences between conditions ($p > .05$ in all cases; Table 14).

Table 14*Descriptive Statistics for Accuracy and Response Times per Condition*

Target Words	Accuracy						Response Times					
	Old		New		All		Old		New		All	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Expected	.97	.03	.99	.02	.98	.03	708	112	707	92	707	102
Second-Best	.97	.04	.98	.03	.98	.03	721	106	706	92	713	99
Unexpected	.99	.03	.99	.02	.99	.02	715	111	709	89	712	100

Note. *M* = mean; *SD* = standard deviation

4.3.1.2. Plausibility Ratings

The sentence plausibility questionnaire showed that in general all sentences were plausible, with a mean score above 3 in the 5-point scale. A univariate ANOVA showed a main effect of Target Word [$F(2, 447) = 139.48, p < .001, \eta_p^2 = .384$]. Sentences completed with an unexpected word had a lower plausibility score ($M = 3.56, SD = 0.89$) than sentences completed with the most expected ($M = 4.64, SD = 0.36$) and second-best words ($M = 4.50, SD = 0.50; p < .001$ in both cases). The mean plausibility score for sentences completed with the most expected and the second-best word did not differ ($p > .05$).

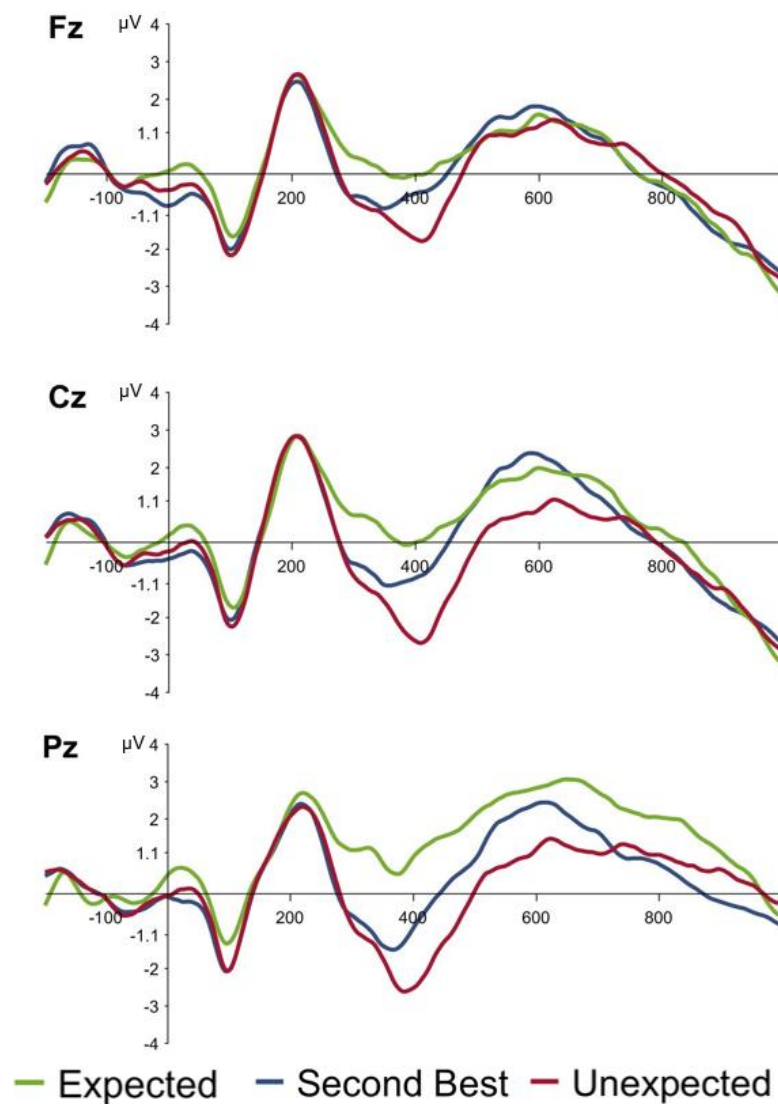
4.3.2. ERP Results

Visual inspection of the grand average ERPs (see Figure 10) revealed similar patterns to those observed in previous sentence comprehension studies that used a word-by-word visual paradigm. Target words in all conditions elicited an initial positive going peak (P1), a negative going peak (N1), followed by a positivity (P2) peaking around 250ms that was broadly distributed across the scalp. These components were followed by

a negativity, peaking between 300 and 500ms (N400), that was largest at centro-parietal sites (see Figures 10 and 11). After the N400, the ERPs in all conditions became more positive. Visual inspection showed a slight increased positivity over the left frontal for the second-best and unexpected words compared with expected words (starting at around 450ms), that afterwards maintained a positive trend for the unexpected words alone (see Figure 12). A 12-Hz low-pass filter was applied to the grand average waveforms presented in Figures 10, 11 and 12 for illustration purposes only.

Figure 10

Grand Average ERPs Waveforms for Fz, Cz and Pz Electrodes Sites

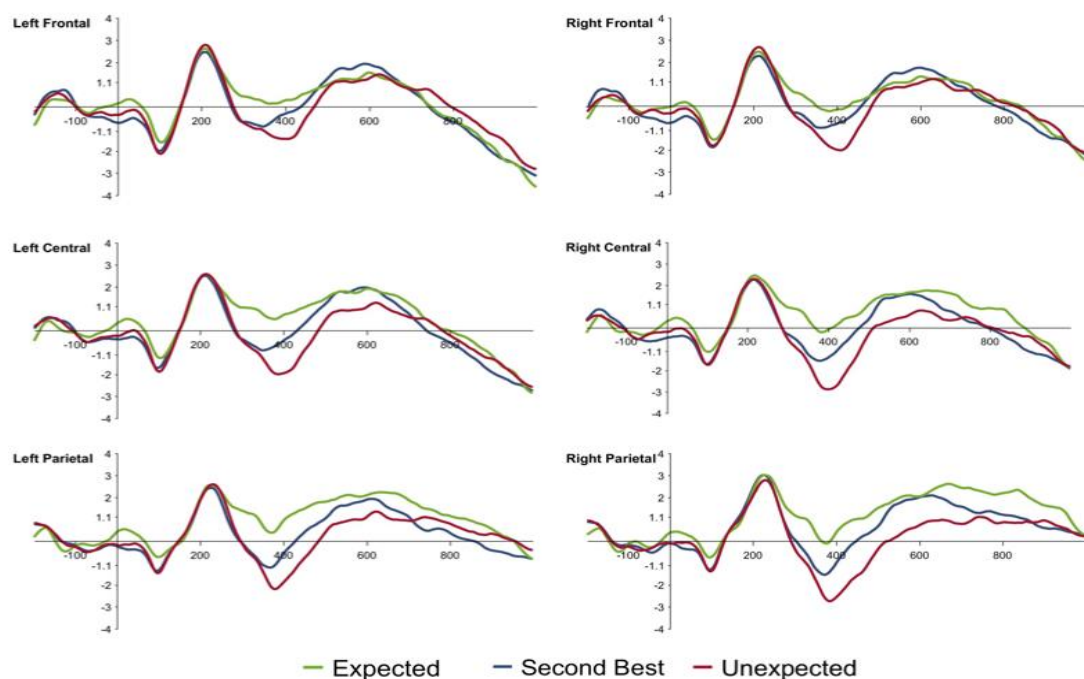


4.3.2.1. N400: Mean Amplitude

The repeated-measures ANOVA for the mean amplitude between 300-500ms revealed a main effect of Target Word ($F(2, 58) = 10.13, p < .001, \eta_p^2 = .259$) and of Hemisphere ($F(1, 29) = 13.75, p = .001, \eta_p^2 = .322$). Additionally, there was a significant Target Word by Region interaction ($F(4, 116) = 5.92, p = .001, \eta_p^2 = .170$). Consistent with past findings, planned comparisons revealed that expected words elicited a less negative N400 than unexpected words ($p < .001$). This difference was significant over frontal, central and parietal electrode sites ($p < .001$ in all cases; Figure 11). Expected words also elicited a less negative N400 than second-best target words, although only marginally significant ($p = .055$). This difference in amplitude was significant in central ($p = .05$) and parietal regions ($p = .004$). The main effect of Hemisphere showed that the mean amplitude was more negative in right electrodes compared with left electrodes ($-0.58\mu\text{V}$ vs. $-0.14\mu\text{V}$).

Figure 11

Grand Average ERPs Waveforms across ROIs



In a follow-up analysis we split the 200ms interval of the N400 component, into an earlier window (300-400ms) and later window (400-500ms), to better characterize the changes in the amplitude of this component over time.

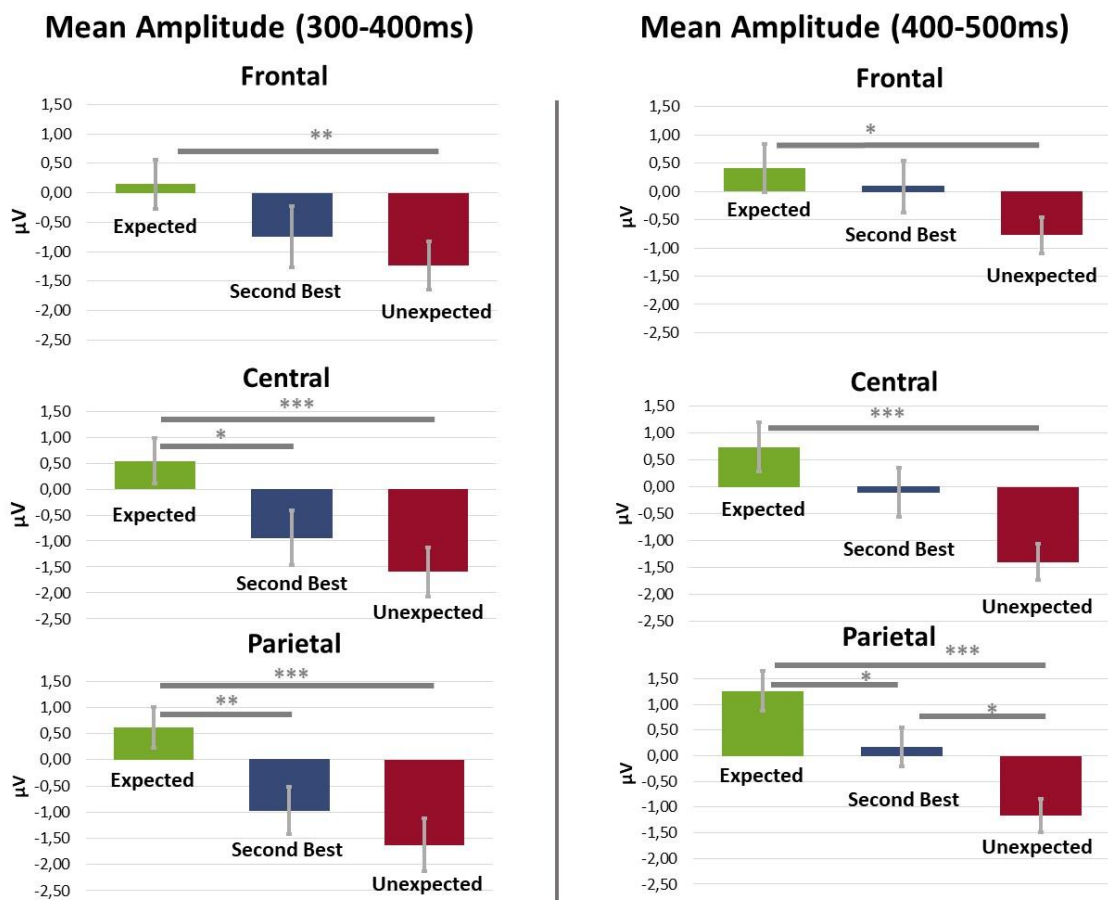
For the earlier window (300-400ms), we found a significant effect of Target Word ($F(2, 58) = 9.94, p < .001, \eta_p^2 = .255$) and of Hemisphere ($F(1, 29) = 5.14, p = .031, \eta_p^2 = .151$), as well as an Target Word by Region interaction ($F(4, 116) = 4.47, p = .005, \eta_p^2 = .133$). Expected words elicited a less negative N400s than unexpected ($p < .001$) and second-best words ($p = .019$). While the difference in mean amplitude between expected and unexpected words was significant in all regions ($p < .01$), the difference between expected and second-best words was observed only in central and parietal electrodes ($p = .017$ and $p = .002$, respectively; Figure 12). The main effect of Hemisphere showed that overall the mean amplitude was more negative in right electrodes compared with left electrodes ($-0.79\mu\text{V}$ vs. $-0.50\mu\text{V}$).

For the later window (400-500ms), main effects of Target Word ($F(2, 58) = 9.04, p < .001, \eta_p^2 = .238$) and Hemisphere ($F(1, 29) = 24.33, p < .001, \eta_p^2 = .456$) were observed. Moreover, there was a significant Target Word by Region interaction ($F(4, 116) = 6.45, p = .001, \eta_p^2 = .182$). As illustrated in Figure 12, over the frontal electrodes, only the difference in mean amplitude between expected and unexpected words was significant ($p = .023$). In the central ROI, the difference in mean amplitude between expected and unexpected words was significant ($p < .001$), whereas the difference between second-best and unexpected words showed a marginal trend toward significance ($p = .07$). Interestingly, a graded effect was observed over parietal electrode sites, as demonstrated by a significant difference in mean amplitude between expected and unexpected ($p < .001$), expected and second-best ($p = .034$) and second-best and unexpected conditions (p

= .032). Regarding the effects of Hemisphere, the results showed that the mean amplitude was more negative in right electrodes compared with left electrodes (-0.39 μ V vs. 0.21 μ V).

Figure 12

ERP Mean Amplitude across ROIs in the Earlier (300-400ms) and Later (400-500ms) Time Windows



Note. Error bars indicate standard error of the mean. All significant pairwise differences (using Bonferroni-adjusted significance levels) for condition contrasts are indicated.

* $p < .05$. ** $p < .01$ *** $p < .001$.

4.3.2.2. N400: Latency Analysis

The repeated-measures ANOVA for the onset latencies of the N400 did not reveal any differences in the onset time of the N400 between the three types of Target Word (F

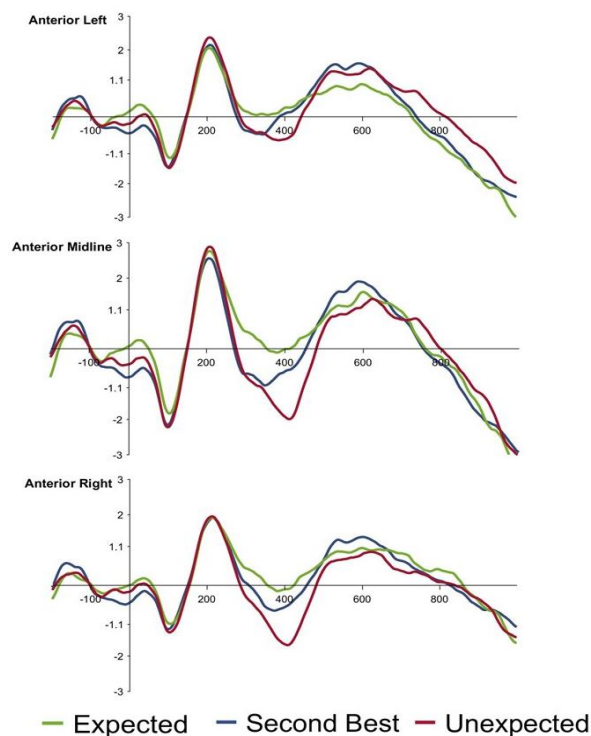
< 1; Expected: $M = 381\text{ms}$, Second Best: $M = 371\text{ms}$, Unexpected: $M = 376\text{ms}$), and no other main effects or interactions. Similar results were found when the analysis was conducted using the peak latency, i.e., time of the maximum negative point between 300 and 500ms.

4.3.2.2. PNP

Visual inspection suggested a condition-related difference following the N400, particularly over the left frontal electrodes as illustrated in Figure 13. In the 450-650ms interval, there was a small increased positivity for the second-best and unexpected words compared with expected words. Between 700-900ms, the increased positivity only remained for the unexpected words. Due to this distinct pattern we chose to run two separate repeated measures ANOVAs, one in the first window (450-650ms) and another in the second window (700-900ms).

Figure 13

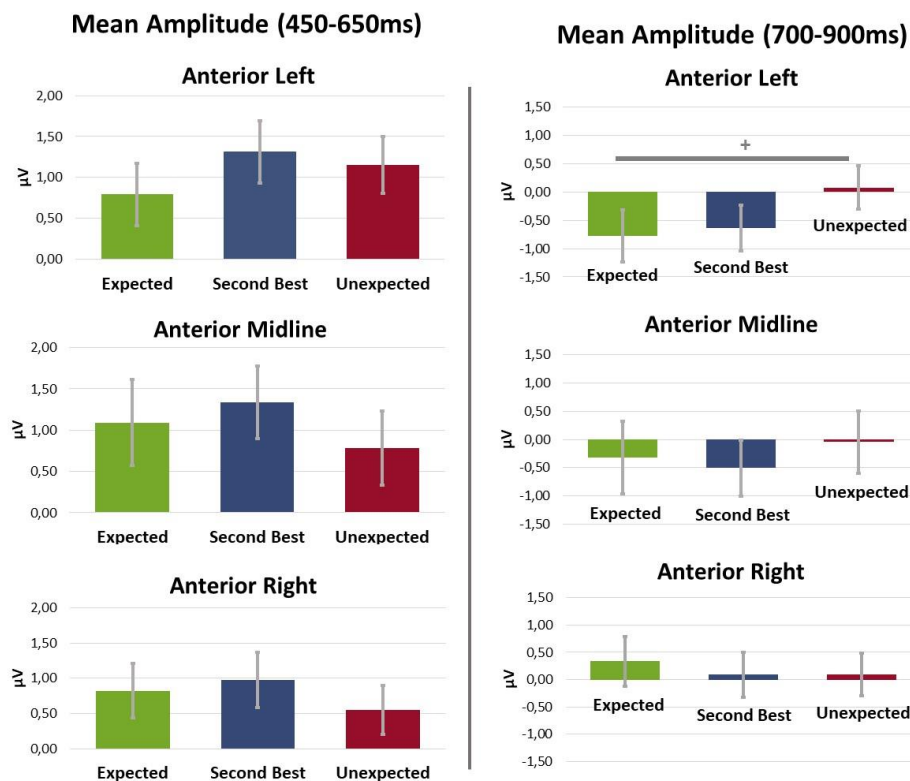
Grand average ERPs waveforms across ROIs



In the first window (450-650ms), there was a significant Target Word by Laterality interaction ($F(4, 116) = 2.52, p = .045, \eta_p^2 = .08$). Planned comparisons revealed that unexpected words evoked a more positive mean amplitude in left than right hemisphere ($1.15\mu\text{V}$ vs. $0.55\mu\text{V}$; $p = .031$), while second-best words only elicited a marginal trend toward significance between the midline and the right hemisphere electrodes ($1.33\mu\text{V}$ vs. $0.98\mu\text{V}$; $p = .089$). In contrast to previous findings, we did not observe any significant difference between target words in the left hemisphere (Figure 14).

Figure 14

ERP Mean Amplitude across ROIs in the Earlier (450-650ms) and Later (700-900ms) Time Windows



Note. Error bars indicate standard error of the mean. All significant pairwise differences (using Bonferroni-adjusted significance levels) for condition contrasts are indicated.

+ $p < .1$

In the second window (700-900ms), there was a main effect of Laterality ($F(2, 58) = 3.19, p = .049, \eta_p^2 = .099$) and an Target Word by Laterality interaction ($F(4, 116) = 3.50, p = .01, \eta_p^2 = .108$). The mean amplitude was more negative for left than right hemisphere electrodes ($-0.45\mu\text{V}$ vs. $0.17\mu\text{V}$), and this difference was significant for expected ($p = .001$) and second-best words ($p = .026$). Additionally, congruent with previous studies, a trend towards a more positive mean amplitude for unexpected words compared with expected words was found in the left hemisphere ($p = .087$; Figure 14).

4.4. Discussion

In the present study, we investigated predictive mechanisms in sentence comprehension, by exploring both the facilitation effect found for expected words, as revealed by the N400 component, and the costs associated with the processing of less expected words, focusing on the PNP component. We found a facilitation effect for expected words, reflected by a reduced N400 amplitude. Furthermore, there was a distinct pattern of the N400 amplitude concerning second-best and unexpected words. The unexpected words showed a more negative N400 during the typical range of that component (300-500ms), while the second-best words exhibited only a more negative N400 in the initial phase (300-400ms). Regarding the costs of processing less probable words, we only found a trend towards a more positive PNP for unexpected words when compared with expected words.

4.4.1. Predictive Mechanisms and the N400 Component

The analysis of the amplitude of the N400 in the typical time window, between 300-500ms after the onset of the target word, revealed a less negative N400 for processing expected relative to unexpected words in sentences moderately constrained. This was a

very robust effect, observed across the scalp, and consistent with prior literature (e.g., DeLong et al., 2005; Federmeier et al., 2007; Kutas & Hillyard, 1980). This result suggests that the processing of sentences is easier when a highly expected word is presented whereas when the presented word is not supported by the previous sentence context, as it happens with unexpected words, there is an increased effort to process those words, as indexed by an enhanced amplitude of the N400. Moreover, the most expected words also showed a reduced N400 amplitude compared with the second-best words in central and parietal regions, but critically second-best words did not differ from unexpected words in these regions. This difference reveals that the processing of second-best words is not facilitated, or at least not in the same magnitude as the most expected words, even though second-best words are also probable candidates. The facilitation effect found only for the most expected word is congruent with the serial graded proposal that states that early-on only the most expected word can be pre-activated (Brothers et al., 2015; Thornhill & Van Petten, 2012). In line with prior studies, that had shown that in high constraint sentences the representations that are pre-activated are highly specific (e.g., DeLong et al., 2005; Ito et al., 2016; Kwon et al., 2017; Laszlo & Federmeier, 2009; Szewczyk & Schriefers, 2013; Wicha et al., 2004), our results point to the pre-activation of a particular word. Since our analysis only started at the onset of the critical words, we do not have direct evidence of prediction in this experiment, but these assumptions are strongly motivated by previous studies. Importantly, our design can be used to test if the facilitation effect spreads to all probable candidates, according with a parallel proposal, or if it is initially exclusive for the highest expected word, as stated by the serial graded proposal. Since the parallel proposal assumes that all probable candidates can be activated before the presentation of the critical word, any probable candidate should be more easily processed, reflecting a reduced amplitude of the N400 component starting at the onset of

the word. In contrast, the serial graded proposal states that the alternative candidates would only be activated after perceiving that the most expected word will not appear, which would imply that only after the onset of the second-best words there could occur a facilitation effect, delaying the impact on the reduction of N400 amplitude.

To better characterize the processing of the second-best candidate, our condition of interest, we split the temporal window into an earlier (300-400ms) and a later (400-500ms) time windows. Distinct patterns of results were observed across the two time-windows. In the earlier window, the N400 amplitude was less negative for the expected than the second-best candidate, with no significant differences between second-best and unexpected words, following the same pattern observed when we considered the whole time window (300-500ms). In contrast, in the later window, the N400 amplitude was less negative for the second-best words, which resulted in a graded mean amplitude between conditions. The graded increase in amplitude proceeded from the expected to the second-best to the unexpected condition (Expected < Second-Best < Unexpected) and was strongest in the parietal region, where the N400 effects are typically the largest (Kutas & Federmeier, 2011; Lau et al., 2008).

This evidence demonstrates that initially the facilitation effect is restricted to the most expected word, which suggests that the prediction mechanism might occur in a serial graded way, whereby a specific candidate is initially activated, and other probable words are activated only in a later stage of the processing. Indeed, in our study, in the later window (400-500ms), there was a facilitation effect for the second-best candidate compared to the unexpected word, as revealed by a less negative N400. This pattern is consistent with the view that the reader can rapidly shift the estimation towards others probable candidates when the initial prediction is incorrect (Thornhill & Van Petten, 2012).

The enhanced negativity found between 300 to 500ms after word onset for both unexpected and second-best words could be a reflex of a mismatch between the pre-activated word and the presented word (Lee & Federmeier, 2009). However, this hypothesis does not seem suitable, because the N400 amplitude should not differ between unexpected and second-best words, since the mismatch should be equivalent for both cases. An alternative account would be that the enhanced negativity is related to the demands of lexical retrieval (e.g., Monsalve, Pérez, & Molinaro, 2014; Zhu et al., 2012). The enhanced negativity that we found for second-best and unexpected words would then be explained by the need to fully activate both words from baseline (i.e., not having been primed). Thus, the facilitation effect that emerges later for the second-best words could indicate that those words are more easily accessed, probably because they have a stronger support for the sentential context. Lastly, some authors have proposed that the N400 is a complex component that reflects more than one cognitive process, the retrieval of lexical features and the demands of integrating words in the sentence context (Lau et al., 2008). In this case the later facilitation effect found for second-best could be related with either a facilitated retrieval or a simplified integration of these words when compared with the unexpected words.

Some authors have claimed that the N400 effect reflects a word's ease of integration into the sentential context, which in turn may reflect the unification processes involved in generating a coherent interpretation of the sentence meaning (Hagoort, 2005; Zhu et al., 2012). Readers' subjective plausibility score of the sentences is often used to measure how well the words fit in the sentential context. Previous studies have shown that sentence plausibility affects the processing of equally probable words. Unexpected words that are less plausible (e.g., "It was difficult to understand the visiting professor. Like many foreigners he spoke with an APRON..."), where the expected word was

‘accent’) triggered a stronger N400 (i.e., more negative) relative to more plausible unexpected words (e.g., “It was difficult to understand the visiting professor. Like many foreigners he spoke with a LISP...”; e.g., Brothers et al., 2015; DeLong, Quante, & Kutas, 2014). In our study, the mean plausibility score confirmed that all sentences were considered plausible (mean score above 3 in a 5 point-scale), although the sentences completed with unexpected words had a lower level of plausibility compared with the most expected and second-best words. Critically, the plausibility score for sentences completed with the most expected and the second-best word was equivalent. This shows that the difference found in the N400 mean amplitude between these two conditions is independent of the degree of the sentences’ plausibility and that this ERP component cannot be exclusively associated with the difficulty in integrating words for sentence unification.

This late graded effect argues against the parallel probabilistic model that states that all probable candidates are activated at the same time, and therefore, the facilitation effect emerges already at the onset of the word (DeLong et al., 2005; Frisson et al., 2017). Importantly, it is unlikely that the late reduction of the N400 amplitude for the second-best candidates is due to the lower level of expectancy of those words. Previous studies have consistently found a reduced negativity for weakly expected words at the 300-500 time window (Federmeier et al., 2007; Kutas & Hillyard, 1984; Wlotko & Federmeier, 2012b) and also in an early window (300-400ms: Thornhill & Van Petten, 2012). In those studies, the cloze probability of the weakly expected words was similar to the cloze probability of our second-best candidates, which undermines the possibility that the absence of significant difference between second-best and unexpected words found in our study was merely caused by the small difference in cloze probability between the second-best and the unexpected words (~ 0.2). Thus, if our results were due to the degree of

expectancy, then the N400 amplitude reduction for the second-best words should have appeared early on and consistently across the entire time window.

It may be argued that using a parametric analysis would be more suited to investigate the facilitation effects of probable candidates, specifically to test the parallel proposal that assumes a continued level of facilitation according with the degree of cloze probability of the probable candidates. This method could allow a more fine-grained analysis to explore the continuous variation of cognitive processes (e.g., DeLong et al., 2005; Dien, Frishkoff, Cerbone, & Tucker, 2003). Yet, as our stimuli have clear gaps in the range of cloze probability between conditions, it seemed more fitting to use the repeated-measures ANOVA. This is a conventional approach widely used in EEG with similar designs (e.g., Brothers et al., 2015; Federmeier et al., 2007; Thornhill & Van Petten, 2012) and is reasonably conservative (Luck, 2014).

Finally, the analysis of the onset latencies of the N400 component did not reveal any differences between conditions. Thus, the hypothesis that second-best words would elicit the N400 effect with a delay as proposed by the serial graded account was not supported by the latency analysis. N400 latency has not been frequently analysed due to the fact that it is generally quite stable (Kutas & Federmeier, 2011). To our knowledge only a few studies investigating the integration of words during sentence processing have reported this type of analysis and the results were inconsistent (Brothers et al., 2015, 2017). Therefore, the lack of differences in the onset latency between the conditions is not completely surprising. Latency differences were instead found when comparing the two window-times (300-400ms vs. 400-500ms), revealing that there is a temporal delay in the facilitation effects for probable candidates that are not the most expected words.

In sum, the results showed a robust facilitation effect for the most expected words, which is consistent with prior literature. There was also a facilitation effect for the second-

best words, yet it was weaker and delayed, which suggests that there is no pre-activation of other probable words. The late facilitation effect may indicate that the readers are able to rapidly shift their estimation towards other probable candidates, but only after realizing that the initial prediction is incorrect. Therefore, our results support the serial graded proposal of predictive mechanisms in language processing.

4.4.2. Inhibition/Reinterpretation and the PNP Component

The PNP component analysis revealed a weak trend towards a more positive mean amplitude in the left anterior electrodes between 700-900ms for unexpected relative to expected words. In part, the weakness of this effect could be a consequence of the type of sentences selected, as the most expected words have lower cloze probability compared with the majority of the studies that have inspected this component (e.g., DeLong et al., 2014; Federmeier et al., 2007). Those studies comprise high constraint sentences with the mean of cloze probability above 0.80, whereas our sentences were moderately constrained with a mean cloze probability of 0.61. PNP has been more frequently reported during the processing of unexpected words when there is a strong expected word for the sentence. It has been associated with competition processes elicited by the expected word that has already been pre-activated and the unexpected word that is presented and must be inhibited (Brothers et al., 2015; DeLong et al., 2014; Federmeier et al., 2007). If PNP is indeed related with suppression or inhibition of the pre-activated expected word, the degree of expectancy of that word is critical for evoking this component and for its magnitude. In line with this view, a few previous studies have shown that sentences that have a weakly expected word (CP = 0.27), when completed with an unexpected word, did not prompt the late positivity component (e.g., Federmeier et al., 2007). Importantly, the PNP amplitude has also been proposed to be influenced by the task demands and stimulus time frame. In tasks that explicitly ask participants to predict the upcoming

words, the PNP elicited by the unexpected words had an increased magnitude compared with passive reading tasks (Brothers et al., 2015, 2017). Tasks that require the prediction of the upcoming words presumably promote pre-activation processes which may lead to a higher need to suppress those pre-activated words when they are not presented. Furthermore, the anticipatory comprehension mechanisms also seem to be modulated by the time available for word processing. Previous studies have reported that the N400 facilitation effect found for expected words is enhanced when the time of word presentation is extended (500ms vs. 250ms; Wlotko & Federmeier, 2015; similar results were found using the individualized reading time of words; Payne & Federmeier, 2017). To our knowledge, no previous study examined whether the magnitude of the PNP is affected by the amount of time the reader has to process each word, but some studies have chosen longer timings for word presentation and intervals (e.g., 300ms for word presentation and 600ms of interval between words; Brothers et al., 2015, 2017), which could allow more time to engage in predictive processes. In our study participants had a short time to process each word (each word was presented for 200ms and the interval between words was 300ms) and were asked to read the sentences and perform a memory task at the end of each sentence. There was no mention to predicting upcoming words, the critical ending word was presented similarly to the other words in the sentence and the amount of time available for word processing was quite restrict. As such, these methodological precautions could have reduced the magnitude of the PNP effect.

It should be noted that the trend observed for the unexpected words was not present for the second-best words. More specifically, the PNP mean amplitude did not differ for the most expected and the second-best words in the 700-900ms interval. This may indicate that this late component is related with the effort to interpret the sentence, since only the unexpected words are not supported from the sentential context.

Additionally, unexpected words may induce a re-interpretation of the sentence meaning, as they modify the sentences' meaning in a greater extent than expected and second-best words. For instance, when presented with "Her skin was red from spending the day at the ..." most readers associate this context with a day at the beach (the word 'beach' is the most expected word). When the unexpected word 'farm' appears, it changes significantly the scenario that the reader is considering (Federmeier et al., 2007). The second-best words are better supported by the sentence context, as they are probable candidates of those sentences and, in some cases, they may share semantic features with the most expected word. Hence re-interpretation of the sentence meaning may be unnecessary, and consequently those sentences will not induce the late positivity component. Thus, this late ERP component may index a late revision process that is undertaken after semantic access is on-going or completed (Kuperberg & Jaeger, 2016; Payne & Federmeier, 2017; Thornhill & Van Petten, 2012). This hypothesis is more consistent with the parallel proposal of the predictive mechanisms that do not assume an interference or competition between strong, weak and unexpected candidates.

An alternative view proposes that the PNP component reflects inhibition or suppression processes that occur when the reader finds an unexpected word in high constraint sentences with a strong expected word (Brothers et al., 2015; DeLong et al., 2014; Federmeier et al., 2007). This view, compatible with strong commitment towards the most expected words assumed by the serial graded proposal, is not supported by our findings as we only observed a trend to an enhanced positivity for the unexpected words, and not for the second-best words. Thus, this component does not seem to reflect inhibition or suppression of the most expected word, otherwise it should have also been observed for second-best words. The serial graded proposal only can accommodate the results observed if it assumes a less strict commitment towards the most expected word.

Some authors proposed that the linguistic processing can rapidly shift towards others probable candidate (Thornhill & Van Petten, 2012), therefore the predictive mechanisms have to be flexible and quick to update to other probable candidates, which seem incongruent with strict and rigid commitment towards the most expected words.

It's important to highlight that the absence of an increased mean amplitude of PNP for the second-best words compared with the most expected words can be partially explained by the late facilitation effect found for the second-best words. This effect indicates that those words were retrieved and integrated faster than the unexpected words. And, additionally, the integration of the second-best words can be facilitated since those words have a stronger support from the sentential context. Thus, there is a reduced probability of being necessary to reanalyse or reinterpret the sentences completed with second-best words.

Since PNP is a late ERP component it may indicate that the underlying cognitive processes occur in late stage of language comprehension. Thus, the inhibition process seems less congruent as being the cognitive process associated with the PNP component. The process of suppressing the irrelevant word should start after the reader finds the mismatch between the pre-activated word and the presented word. Since orthographic and phonological features of words are usually processed during the initial 200ms after the onset of the words (e.g., Comesaña et al., 2012; Hoshino et al., 2011), the mismatch should be detected earlier and consequently the suppression should initiate at an earlier stage of the processing. The re-analysis hypothesis seems more compatible with the time frame of the PNP component. As the re-analysis can only occur after the retrieval of the lexical information of the words, it should happen 500ms after the onset of the words. Additionally, there is another late ERP component, the P600, that has a similar timing as

the PNP, yet with a distinct topography, that has been associated with syntactic re-analysis of sentences (e.g., DeLong et al., 2014).

Even though our PNP results should be interpreted with caution as the findings were not statistically robust, they suggest that the PNP is related with later stages of sentence interpretation that may be associated with difficulties in combining the meaning of the word with the sentence context, and if necessary, re-analysis or re-interpretation of the sentence meaning.

4.5. Conclusion

We investigated the electrophysiological bases of word expectancy in sentence processing. Our results provide evidence for a facilitation effect for the most expected word, and a later facilitation effect for the second most expected word, as revealed by the N400 waveform. These findings are compatible with the serial graded account of predictive mechanisms during sentence processing (Thornhill & Van Petten, 2012). Only one candidate, the most expected one, can be pre-activated, and only if this prediction is disconfirmed then the system can update the predictions towards other probable candidates. Additionally, processing an unexpected word seems to involve additional resources in a later stage of processing, as evidenced by the PNP component. This effect may be associated with an increased effort to integrate those words into the sentence context, which could further imply a reanalysis or revision of the sentence meaning.

In future studies, in order to complement our findings, it could be interesting to measure the brain processing before the onset of the critical words, such as manipulating the preceding words (e.g., manipulating the gender of the preceding articles), varying the presentation times (e.g., changing the time intervals between words, or the time of

presentation of each word), or by analysing EEG data using methods that allow a continuous analyses of brain activity such as oscillation analysis.

5. THE INFLUENCE OF CONTEXT CONSTRAINT ON SEMANTIC INTEGRATION DURING SENTENCE COMPREHENSION: FUNCTIONAL DISSOCIATION OF THE LIFG

5.1. Introduction

To comprehend the message conveyed in a sentence, readers need to quickly access the meaning of the words and combine them to build-up the sentence's meaning. After processing the first words of a sentence, a sentential context is created, which influences the processing of the subsequent words. When an upcoming word is consistent with the context (e.g., the word 'plate' after the sentential context "He scraped the cold food from his ..."), it is easily integrated into the sentence. Yet, language is not always so foreseeable. In some cases, the upcoming words are inconsistent with the interpretation that the reader was creating (e.g., 'chain' is an unexpected and incongruent word in the example above). In other cases, the sentential context is not sufficiently constrained to generate a specific word candidate (e.g., "There was nothing wrong with the..." where multiple words can complete this context). In both of these situations, additional effort is needed to access the final word and integrate it into the sentence. Occasionally, they may even require re-interpretation of the sentence's meaning.

Behavioural studies have shown that readers take longer to name and respond to words that are not supported by the previous sentential context (e.g., Schubert & Eimas, 1977; West & Stanovich, 1978). Additionally, eye-tracking studies have reported that sentences completed with unexpected words are more likely to generate regression saccades than sentences that are completed with expected words (e.g., Staub, 2011). Besides these behavioural effects, the neuroimaging literature has demonstrated that the contextual fit of words modulates activation of the left fronto-temporal language network.

Namely, several studies have shown enhanced activation in the left inferior frontal gyrus (LIFG) when readers process sentences completed with unexpected words relative to expected words (e.g., Hagoort et al., 2004; Kuperberg, Sitnikova, & Lakshmanan, 2008; Zhu et al., 2012). It is still uncertain which cognitive processes underlie such behavioural and neural results. Some authors argue that these effects are associated with increased difficulty in the integration of those words into the sentence context, i.e., in the unification of the semantic meaning of words into the sentence context (e.g., Hagoort, 2005, 2017; Zhu et al., 2012). Alternatively, others have suggested that the effects arise from the interference between the expected word and the presented unexpected word, particularly when the latter appear in a strongly biased sentential context (e.g., Novick et al., 2005). Moreover, it is possible that distinct areas within the LIFG are activated depending on the cognitive processes being computed. According to the neurobiological model proposed by Hagoort (2005, 2017), semantic and syntactic integration recruit a more anterior and a more posterior region of LIFG, respectively. An alternative account postulates that anterior areas of LIFG are triggered when retrieval processes are being executed, while the posterior areas of LIFG are associated with competition resolution (Badre, Poldrack, Paré-Blagoev, Insler, & Wagner, 2005; Badre & Wagner, 2007).

The present study aims to further explore the role of context on word integration during sentence comprehension. Specifically, we want to identify which cognitive processes are recruited during the integration of unexpected words, given the sentential context, i.e., semantic unification or interference and selection. Furthermore, in doing so we hope to clarify the functional roles of the anterior and posterior regions of the LIFG, notably in semantic unification, semantic retrieval and competition resolution.

5.1.2. The role of LIFG in Integration of Words During Sentence Comprehension

Several fMRI studies have consistently associated sentence comprehension to an extensive fronto-temporal network (Hagoort & Indefrey, 2014; Rodd, Vitello, Woollams, & Adank, 2015, for a review), involving the middle and inferior temporal gyri (e.g., Ikuta et al., 2006; Stowe et al., 1998; Xu et al., 2005), posterior superior temporal gyrus, LIFG (e.g., Friederici et al., 2000; Stowe et al., 1998; Xu et al., 2005) and left superior frontal cortex (e.g., Bulut et al., 2017). Though all these areas seem to collaborate dynamically to achieve sentence comprehension evidence point towards a prominent role of each area in specific cognitive processes.

The Memory, Unification and Control (MUC) Framework postulates that distinct processes are instantiated in specific brain regions (e.g., Hagoort, 2005, 2016). In particular, temporal areas, in the middle and inferior temporal gyri and in the posterior superior temporal gyrus, are associated with retrieving from memory word meanings. Unification processes that bind the words into sentences - a meaningful whole - are linked to the LIFG. Additionally, control processes, that relate language to action, such as managing turn taking during conversation, require the involvement of dorsolateral prefrontal cortex and anterior cingulate gyrus (e.g., Hagoort, 2005, 2016). According to this framework, when a word is supported by the previous sentential context, it is less demanding to integrate it and thus there is weaker LIFG activation compared to a word that is not suitable to that context. Indeed, several fMRI studies that have manipulated word congruency have found enhanced activation of the LIFG for sentences completed with incongruent words (e.g., “The pilot flies the BOOK”), compared to sentences completed with congruent words (e.g., “The pilot flies the PLANE”; Baumgaertner et al., 2002; Cardillo et al., 2004; Kiehl et al., 2002; Ni et al., 2000; Zhu et al., 2013, 2012).

Hagoort and colleagues have argued that this effect reflects the effort that the readers have to engage in to unify those words into the sentence context (e.g., Hagoort et al., 2004; Zhu et al., 2013, 2012). It is worth noting that in such studies the incongruent words are semantically inappropriate and do not allow readers to generate a coherent overall meaning of the sentence. This may lead to a disruption of the unification process or, instead, could prompt the reader to engage in additional processes, namely repairing processes that are not part of normal reading (Huang et al., 2012; Indefrey, Hagoort, Herzog, Seitz, & Brown, 2001; Rodd et al., 2015). In an attempt to overcome such limitation, some fMRI studies have explored the role of context by contrasting the processing of sentences completed with expected and unexpected words, i.e., words that are not expected candidates but are syntactically and semantically suitable to complete those contexts (Baumgaertner et al., 2002; Huang et al., 2012). Importantly, such studies have also reported greater activation in LIFG (Huang et al., 2012) and middle temporal gyrus (Baumgaertner et al., 2002; Huang et al., 2012) for processing sentences with plausible but unexpected words. Thus, LIFG is engaged not only when unification is disrupted, but also when plausible completions are not supported by the previous context, which may recruit additional integration processing (Hagoort et al., 2004; Huang et al., 2012).

Most fMRI studies have used sentences that have a high constraint context, i.e., the context strongly points towards a specific candidate or interpretation (e.g., Baumgaertner et al., 2002; Huang et al., 2012; Zhu et al., 2012). Some electrophysiological studies have found evidence that readers can use the contextual information, especially in high constraint contexts, to anticipate the upcoming words (e.g., DeLong et al., 2005; Martin et al., 2013; Van Berkum et al., 2005; Wicha et al., 2004). So, it is possible that in high constraint sentences the expected word has already

been activated when the critical word appears. When the reader's expectations are defied, an interference between the anticipated word and the unexpected word may occur (Federmeier et al, 2007; Kuperberg & Jaeger, 2016). Thus, enhanced LIFG activation may be associated with cognitive control processes that are required to select the contextually relevant meaning (Novick et al., 2005; Nozari & Thompson-schill, 2016). Indeed, a widely recognized proposal, known as the conflict resolution framework, advocates that the LIFG supports inhibition and selection processes required when a prepotent but irrelevant response must be suppressed or when multiple representations are available and only one must be selected (Novick et al., 2009; Vitello & Rodd, 2015; for a related proposal see Badre & Wagner, 2007). In line with this view, fMRI studies using ambiguous words – i.e., words that can refer to different concepts (e.g., 'toast' may refer to a celebratory speech or to a grilled slice of bread) – have shown increased LIFG activation when these words appear in late-disambiguation sentences, in which the disambiguating information is delayed until after the ambiguous words (e.g., Mason & Just, 2007; Musz & Thompson-schill, 2017; Rodd, Longe, Randall, & Tyler, 2010; Vitello et al., 2014; Zemleni et al., 2007). As multiple meanings of the ambiguous words are activated, it is necessary to inhibit the irrelevant word's meanings to select and integrate the adequate meaning (Twilley & Dixon, 2000; Vitello & Rodd, 2015). A similar effect may occur when readers are processing sentences with high constraint contexts completed with unexpected words. The context may lead to retrieval of the expected word while the stimuli (i.e., the final word) requires retrieval of the unexpected word. Hence, the readers, at least momentarily, may have two candidate words competing for integration.

In sum, previous studies have demonstrated that LIFG activation is modulated by the fit of the upcoming words with the previous sentential context. However, they were

not able to unravel which cognitive processes trigger the recruitment of this region. According to the unification hypothesis, this region is necessarily recruited during sentence comprehension, as it plays a central role in the binding of words to create the sentence meaning. This model postulates that the degree of LIFG activation is sensitive to the fitness of the upcoming words to the context, i.e., the LIFG is more strongly activated the less expected the words are. Yet, it is not possible to discard an alternative explanation proposed by the conflict resolution hypothesis in which LIFG is recruited when multiple representations are active and only one should be selected. Thus, increased LIFG activation for sentences completed with an unexpected word may be due to the interference between that word and the word that might have been expected given the constraints of the sentence.

5.1.3. Functional Dissociation of LIFG Subregions

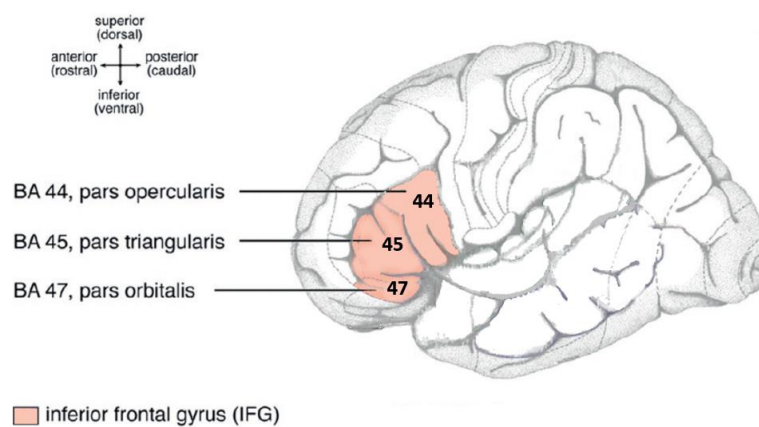
The LIFG is a highly convoluted region that includes three cytoarchitecturally distinct subregions (see Figure 15): the pars orbitalis (BA 47), pars triangularis (BA 45) and pars opercularis (BA 44; Greenlee et al., 2007). Some authors have suggested that the function of the different subregions depends on the type of information being processed (Goucha & Friederici, 2015; Gough, Nobre, & Devlin, 2005; Hagoort, 2005; Hagoort & Indefrey, 2014), while others have proposed that each subregion is linked to a specific cognitive process (Badre et al., 2005; Badre & Wagner, 2007) .

According to the MUC account, the unification of semantic information is supported by anterior regions of the LIFG (BA 47/45). In contrast, the binding of syntactic information activates the central subregions (BA 45/44), whereas the phonological constituent of words recruits more posterior regions of LIFG (Hagoort, 2005, 2016). A recent meta-analysis supports these hypotheses (Hagoort & Indefrey, 2014), with the results showing that sentences with increased semantic demands (e.g., sentence

completed with incongruent words) were associated with greater activation in anterior and ventral regions of the LIFG (BA 45/47). On the other hand, sentences with more complex syntactic structures recruited more posterior and dorsal portions of the LIFG (BA 44/45).

Figure 15

Diagram with Subregions of LIFG



Note. The numbers in the image represent cytoarchitecturally defined Brodmann Areas (BA). (Adapted from Friederici, 2015)

Alternatively, in line with the conflict resolution framework (Novick et al., 2009, 2005), a two-process model of semantic control has been put forward (Badre et al., 2005; Badre & Wagner, 2007). This model has been motivated by data, that comes mostly from memory studies, showing a dissociation within the LIFG between controlled retrieval processes and post-retrieval selection. In particular, controlled retrieval of semantic information from long-term memory has been associated with anterior LIFG (~BA47), while post-retrieval selection (i.e., resolution of the interference between multiple active representations) triggers the posterior LIFG (~BA45). For example, a semantic priming study in which participants were encouraged to use anticipatory strategies (Gold et al.,

2006) showed decreased activation in the anterior LIFG for related pairs (e.g., “FORK” – “SPOON”) compared to neutral pairs (e.g., “BLANK” – “SPOON”), suggesting that processing semantically related pairs recruit this region to a lesser extent, presumably due to the facilitation effect of semantic priming. This finding supports the proposal that anterior LIFG is linked to the retrieval of semantic information. The posterior LIFG was more activated for processing unrelated pairs (e.g., “COAT” – “SPOON”) than neutral pairs (e.g., “BLANK” – “SPOON”), which may indicate that the unrelated prime (“COAT”) could have activated semantically associated words (e.g., ‘blouse’, ‘trousers’) which in turn may interfere with the activation of the unrelated target (“SPOON”). Importantly, in the case of the neutral pairs the targets were preceded by neutral words such as “BLANK” or “READY” which reduced anticipatory processes (Gold et al., 2006). Moreover, the dissociation of retrieval and selection processes in LIFG was also found in a sentence comprehension study (Glaser, Martin, Dyke, Hamilton, & Tan, 2013). The results showed increased anterior LIFG activation when readers had to revise an incorrect sentence interpretation and to retrieve alternative information, whereas the activation of posterior LIFG was triggered by sentences that induced multiple interpretations due to the manipulation of the syntactic and/or semantic information embedded in the noun phrase (e.g., high semantic interference sentence: “The worker was surprised that *the resident who was living near the dangerous neighbor* was complaining about the investigation”).

In the semantic integration literature, various fMRI studies have consistently found greater LIFG activation for processing unexpected words (e.g., Huang et al., 2012; Zhu et al., 2013, 2012). Yet, the specific subregions activated were not consistent across studies. In some cases, the anterior LIFG region shows a parametric modulation of the activation level as a function of the load of integration demands (Zhu et al., 2012). This

result is consistent with the MUC model that proposes that the anterior LIFG is the only region sensitive to the semantic integration demands. Other studies, nonetheless, have found that both anterior and posterior regions demonstrated an expectancy effect, i.e., greater activation for sentences completed with unexpected relative to expected words (Huang et al., 2012; Zhu et al., 2013). The authors argued that these findings did not fully fit into the MUC model. Therefore, the current data does not disentangle if semantic integration is linked specifically with the anterior region of LIFG, as proposed by the MUC model, or if there is a dissociation between the processes associated with anterior and posterior regions of LIFG, as stated by the two-process account.

5.1.4. The Current Study

The present fMRI study investigates the cognitive processes underlying the integration of words into sentences. More specifically, we aim to contrast two proposals that make different predictions regarding the role of the LIFG in sentence comprehension. The semantic unification proposal suggests that integration processes in the LIFG are affected by the fitness of the words to their preceding sentential context. Conversely, the conflict resolution hypothesis states that LIFG activation is critical when multiple words are activated and one must be selected. Moreover, we aim to explore the functional role of specific subregions within the LIFG. The MUC model proposes that the anterior region of the LIFG is associated with the semantic unification, while the posterior region is related with syntactic integration (e.g., Hagoort, 2005; Hagoort & Indefrey, 2014; Zhu et al., 2012). Alternatively, the two-process account proposes that the anterior LIFG supports the controlled retrieval of semantic information whereas the posterior LIFG is crucial for resolving competition between multiple candidates (e.g., Gold et al., 2006; Novick et al., 2005).

To explore these questions, we manipulated the level of expectancy of key words, that could be either expected or unexpected, as it has been done in previous studies, and, more importantly, the constraint level of the sentential context, could be high or weak. The high constraint frames are strongly biased towards a specific word, therefore there is a strongly expected word and few alternative candidates (e.g., “Her job was easy most of the...”: this frame was completed by the majority of the participants with the word ‘time’ and there was only one other word used to complete the frame – ‘day’¹⁰). The low constraint frames have less restricted contexts, so generally multiple candidates are expected and the most expected one has a weaker probability of being used to complete the sentence (e.g., “We used to get company every...”: in this frame only two-fifths of the readers completed with the word ‘night’ and there were six more words used to complete the frame – ‘day, week, Sunday, weekend, Friday, Monday’¹⁰). As demonstrated in several electrophysiological studies, the sentential context modulates the integration of the upcoming words. Namely, in high constraint sentences, access and integration of the expected words is facilitated (e.g., DeLong et al., 2005; Federmeier et al., 2007; Kutas & Hillyard, 1984), whereas the processing of the unexpected words is more demanding and costly (e.g., Brothers et al., 2015; Federmeier et al., 2007). Yet, none of the previous neuroimaging studies have compared the integration of expected and unexpected words in highly constraining *vs.* weakly constraining sentences. This is important as it may help understanding which cognitive mechanisms underlie the activation of LIFG that has been observed during sentence processing.

Following the semantic unification proposal, any word that is not expected will be more demanding to integrate. Therefore, this account predicts increased LIFG activation for sentences completed with unexpected words compared to expected words,

¹⁰ Examples from the dataset of Bloom & Fischer (1980)

independently of the sentence constraint. As some authors have proposed that LIFG recruitment indexes the semantic unification load (e.g., Zhu et al., 2012), we might also observe a difference in the degree of LIFG activation for expected words according with the sentential constraint. Since in the high constraint sentences the expected words are more strongly predicted than in low constraint sentences, they should be more easily integrated, leading to a lower LIFG activation. Conversely, the conflict resolution framework sustains an increased activation of LIFG only for high constraint sentences completed with unexpected words, since in those contexts it is more likely that readers use the context information to anticipate the expected word, that can interfere with the integration of the unexpected word. Whereas in the low constraint condition, as the context is less biasing, the reader is unlikely to anticipate candidates or activate them to a lower extension, therefore, there should be a weaker or even no competition between words.

To explore a potential functional dissociation within the LIFG, two region-of-interest (ROI) – one more anterior and the other more posterior – were analysed. According to the MUC model, greater LIFG activation should be confined to the anterior area, as this region has been associated with semantic unification (e.g., Hagoort, 2005; Hagoort & Indefrey, 2014; Zhu et al., 2012). There should be no effect in posterior LIFG, since this subregion has been linked to syntactic integration processes (which did not differ in the current study). Alternatively, following the two-process account (Badre & Wagner, 2007; Gold et al., 2006), we anticipate that both subregions are engaged during the processing of unexpected words, particularly in high constraining contexts. On the one hand, anterior LIFG activation should reflect the difficulty in accessing and retrieving words less supported by the context, since this region has been linked to controlled semantic retrieval. On the other hand, posterior LIFG should reflect the cognitive

demands associated with resolution of conflict between multiple candidates, notably the interference between the strongly expected word prompted by the high constraint sentences and the unexpected word that is presented.

5.2. Methods

5.2.1. Participants

Twenty-one right-handed native speakers of Portuguese (18 females), aged 18-29 ($M = 21.14$, $SD = 5.44$) participated in this study. All were right-handed, had normal or corrected to normal vision and had no history of neurological impairment or head injury. They all signed an informed written consent to the experimental procedure, which was approved by the ethics committee of FPUL. Participants received a course credit in compensation for their participation.

5.2.2. Material

One hundred and sixty sentences were selected from a pool of 806 sentences that were pre-tested in a cloze probability procedure (see details in Chapter 2). Those sentences were divided in two sets - the high constraint and low constraint - according to the cloze probability of the most expected target word (see examples in Table 15). The eighty sentences in the high constraint set had a strong expected word ($CP = .88$, $SD = .09$, range: $.70 - 1$) and few alternative words were used to complete the sentences ($M = 3.09$, $SD = 1.45$). For the eighty sentences in the low constraint set, the most common completion was a moderately expected word ($CP = .44$, $SD = .10$, range: $.23 - .6$) and many alternative words were used to complete the sentences ($M = 7.53$, $SD = 2.41$). The cloze probability of the target word and the number of alternative words used to complete the sentence were significantly different between the two sets (both $p < .001$). The high

and low constraint sets were composed by sentences that were matched in number of words and number of letters (both $p > .35$). Additionally, the most expected target words for the high and low constraint sentences were matched for several psycholinguistic parameters (see Table 16) obtained from P-Pal database (Soares et al., 2018), including logarithmic word frequency, length, orthographic and phonological neighbours (all $p > .45$).

Table 15

Examples of Sentences per Context

Context	Number		Number		Target Word	Example Sentences
	Words		Letters			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
High constraint	8.75	1.18	35.93	4.91	Expected	“O Júlio foi à biblioteca requisitar um <u>livro</u> ” (Julio went to the library to request a book)
					Unexpected	“O Júlio foi à biblioteca requisitar um <u>vídeo</u> ” (Julio went to the library to request a video)
Low Constraint	8.58	1.16	35.75	6.31	Expected	“O Carlos ia a correr e tropeçou nos <u>atacadores</u> ” (Carlos was running and stumbled on the shoelaces)
					Unexpected	“O Carlos ia a correr e tropeçou nos <u>calhaus</u> ” (Carlos was running and stumbled on the stones)

Note. *M* = mean; *SD* = standard deviation

Each sentence was completed with both its most expected target word (the word with the highest cloze probability for that sentence) and an unexpected but plausible

ending. The unexpected words were not produced by the participants in the pre-test yet were semantically congruent with the sentences. Therefore, the mean cloze probability of the unexpected words for each set of sentences was approximately zero with no significant differences between the two sets ($p > .99$; see Table 16). The expected and unexpected words of high constraint and low constraint sentences were matched for various psycholinguistic parameters, including logarithmic word frequency, length, orthographic and phonological neighbours (all $p > .45$).

Table 16

Means and Standard Deviations of Cloze Probability and the Lexical Characteristics of the Target Word of the Sentences for each condition

Cloze Probability & Lexical Characteristics	High Constraint Sentences				Low Constraint Sentences			
	Expected		Unexpected		Expected		Unexpected	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Cloze Probability	.88	.09	0	.01	.44	.10	0	.01
Logarithmic word frequency	1.09	0.64	1.14	.59	1.17	.69	1.14	.65
Length	6.60	1.95	6.35	1.86	6.81	2.18	6.71	1.67
Orthographic neighbours	4.53	5.84	3.86	4.25	4.19	5.90	3.89	4.89
Phonologic neighbours	4.49	5.73	5.11	5.82	4.26	5.70	4.58	5.60

Note. *M* = mean; *SD* = standard deviation

In addition to the sentence stimuli, we also presented eighty nonsensical sentences (i.e., non-sentence control condition). These were created by shuffling the words of the experimental sentences (forty from each set). The first three words of each sentence were not scrambled to incite participants to read all the words before performing an

acceptability task (e.g., for the sentence “O Júlio foi à biblioteca requisitar um livro”, the non-sentence “O Júlio foi à um requisitar livro biblioteca” was created).

To avoid repetition, we created two lists of sentences such that, for a given context frame, the sentence with the most expected ending word and the sentence with the unexpected ending word belonged to different lists. Each participant read the sentences from only one list. Lists were randomly distributed across participants. Each list was divided into four blocks, each block containing 40 sentences (10 from each condition) and 20 non-sentences. The non-sentence and the sentence that originated from it never appeared in the same block. The order of block presentation was counterbalanced between participants and the order of the stimuli within each block was pseudo-randomized, such that no more than three sentences from same condition or non-sentences were presented in sequence.

5.2.3. Procedure

Each trial began with the presentation of a fixation cross in the centre of the screen for 500ms followed by the presentation of the stimulus (sentence or non-sentence) for 4500ms. During this time participants had to read the stimulus and perform an acceptability task, i.e., decide if the stimulus denoted a correct sentence in Portuguese. Participants responded via button box using the left hand, pressing a key with the left index finger if the stimulus was a correct sentence, otherwise pressing a key with the left middle finger. After the stimulus presentation there was a blank screen with a variable duration (2000, 2500 and 3000ms) in order to optimize the statistical efficiency of the design (Dale, 1999), before the presentation of the next trial. The task was divided into four blocks, each one with 60 trials. Overall, the session included 240 trials and lasted approximately 31 min.

In the beginning of the session, participants signed the informed consent, read the instructions and completed a brief training task before entering the MRI scanner. Presentation and timing of stimuli were controlled using E-Prime software (E.Prime 1.0, Psychology Software Tools, 2006).

5.2.4. MRI Acquisition and fMRI Data Analysis

Scanning was conducted at Sociedade Portuguesa de Ressonância Magnética on a 3-Tesla Philips MR system (Philips Medical Systems, Best, NL) using a standard head coil. Functional data were acquired by using an echo-planar sequence (TR = 2000ms, 34 bottom-up interleaved slices parallel to the AC-PC line, 3mm thick, interslice gap of 0.5mm, 2mm×2mm×3mm in-plane resolution, FOV= 23cm×23cm, matrix size = 116×115). Acquisition covered the entire brain. Before functional data collection, three dummy volumes were discarded to allow for T1 equilibrium. High-resolution T1-weighted anatomical images were also acquired.

Preprocessing and statistical analysis of the data were performed using Statistical Parametric Mapping software (SPM12, Wellcome Institute of Cognitive Neurology, <http://www.fil.ion.ucl.ac.uk/spm/>) implemented in Matlab (Mathworks Inc., Sherborn MA, USA). Pre-processing included motion correction by means of rigid body registration along 3 rotations and 3 translations, coregistration, segmentation, spatial normalization and spatial filtering with an isotropic Gaussian kernel (FWHM = 8mm). Data from one participant was removed from the analysis because of excessive rotation head movements in the four scanning blocks.

Participants were treated as random effects. Data for each subject were modelled with the general linear model using the canonical hemodynamic response function (HRF). There were 5 conditions: high constraint sentence with expected word, high constraint

sentence with unexpected word, low constraint sentence with expected word, low constraint sentence with unexpected word and non-sentence.

The least squares parameter estimates of the best-fitting canonical HRF for each condition of interest were used in pairwise contrasts and stored as a separate image for each subject. Second-level statistics were calculated in several steps. First, sentences and non-sentences were compared in one-tailed t tests. Second, a full factorial design comprising Constraint (high constraint, low constraint) and Expectancy (expected, unexpected) was performed, with 40 trials in each condition. Activations were considered significant if they reached a threshold $p < 0.05$ FWE (family-wise error) corrected at the voxel level. All coordinates reported are in MNI space. The MRICron package was used for visualizing brain images (Rorden, Karnath, & Bonilha, 2007).

To further investigate activations in the LIFG, a ROI analysis was conducted. Two separate spherical ROIs with a 6mm radius were drawn, one in the anterior portion of the LIFG at pars triangularis [-50 22 4] and the other in the posterior portion of the LIFG at pars opercularis [-50 15 15], based on the peak coordinates reported in a recent meta-analysis of sentence processing (Hagoort & Indefrey, 2014). The beta values of each sentence condition were extracted for each participant within those ROIs using the toolbox Marsbar (Brett, Anton, Valabregue & Poline, 2002). The beta values were then entered in two separate 2 x 2 repeated-measures ANOVAs with Constraint (High constraint, Low constraint) and Expectancy (Expected, Unexpected) as the two factors of interest and analysed in SPSS (version 25.0; SPSS Inc., Chicago, IL, USA).

5.3. Results

5.3.1. Behavioural Results

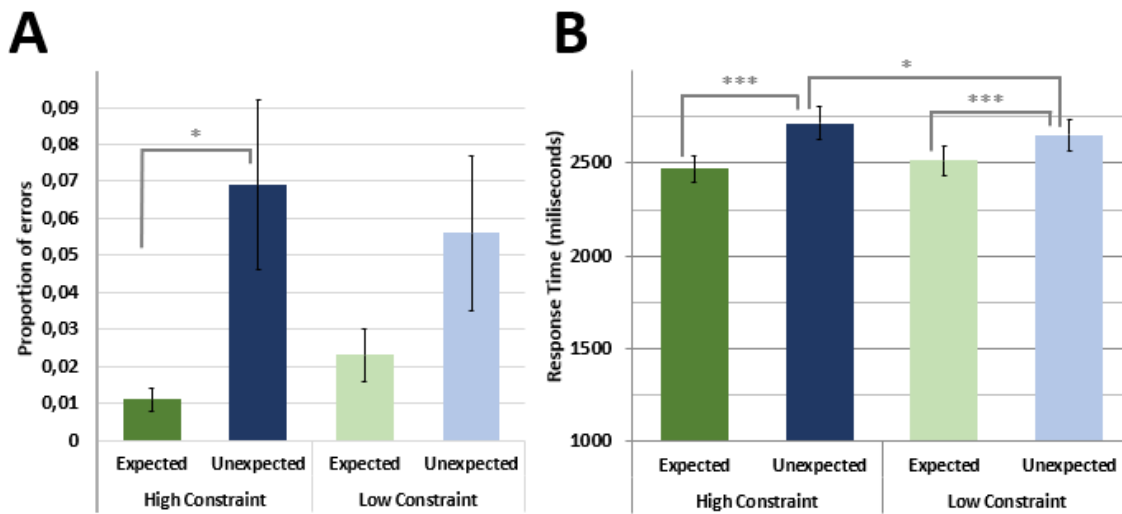
To ensure that participants were performing the sentence verification task adequately, we analysed the proportion of errors and response times (RTs) to correct trials in the sentence and non-sentence conditions. Overall, the mean proportion of errors was very low in both the sentence ($M = .04$) and non-sentence conditions ($M = .03$). A paired sample t -test confirmed that there were no significant differences among conditions ($p > .5$). As for RTs, participants were slower to correctly identify the sentences ($M = 2581\text{ms}$) than the non-sentences ($M = 2439\text{ms}$; $t(19) = 3.31, p < .01$).

Further analyses focused on the sentence condition only. Two separate repeated-measures ANOVAs, on the mean proportion of errors and RTs, were computed using Constraint (High constraint, Low constraint) and Expectancy (Expected, Unexpected) as within-participants measures. The pairwise comparison threshold was set at $p = .05$ after Bonferroni correction. The analyses of the proportion of errors (Figure 16A) revealed a significant main effect of Expectancy ($F(1,19) = 5.44, p < .05, \eta_p^2 = .23$) and an interaction between Constraint and Expectancy ($F(1,19) = 8.81, p < .01, \eta_p^2 = .32$). Participants produced more errors when responding to sentences completed with an unexpected word ($M = .06$) than sentences with an expected word ($M = .02$). The interaction showed that this expectancy effect was only significant for high constraint sentences ($p < .05$).

For RTs (Figure 16B), a main effect of Expectancy ($F(1,19) = 45.57, p < .001, \eta_p^2 = .71$) was found, as participants were faster to respond to sentences when the ending word was expected ($M = 2490\text{ms}$) than unexpected ($M = 2673\text{ms}$). There was also a significant Constraint by Expectancy interaction ($F(1,19) = 8.16, p < .05, \eta_p^2 = .30$) with participants taking longer to respond to sentences ending with an unexpected word in the high constraint than in low constraint context ($p < .05$).

Figure 16

Mean Proportion of Errors and Response Time to the Acceptability Task



Note. A) Mean proportion of errors by sentence condition. B) Mean response time for correct responses in each sentence condition. Error bars indicate standard error of the mean. All significant pairwise differences (using Bonferroni-adjusted significance levels) for condition contrasts are indicated.

* $p < .05$. ** $p < .01$. *** $p < .001$.

5.3.2. fMRI Results

5.3.2.1 Processing Sentences vs. Non-sentences

The first analysis aimed to establish the neural network activated during sentence comprehension, comparing the processing of sentences and non-sentences. The former recruited an extensive network of regions associated with linguistic processing (Table 17 & Figure 17A). There were three significant clusters in the left temporal area, namely in the middle temporal gyrus (BA 21), hippocampus (BA 20, BA 37) and parahippocampal gyrus (BA 30). There were also several peaks of activation in the frontal cortex, including the left medial prefrontal cortex (BA 8, BA 9, BA 10), left medial orbitofrontal cortex (BA 11), left anterior cingulate cortex (BA 32) and right medial orbitofrontal cortex (BA

10). In more posterior regions, we found significant activations in the angular gyrus bilaterally (BA 39), left cuneus (BA 18), left lingual gyrus (BA 18), left calcarine cortex (BA 17) and in the cerebellum.

The reverse contrast, comparing the processing of non-sentences relative to sentences, showed significant clusters in frontal regions including the inferior frontal gyrus bilaterally (BA 48), left middle frontal gyrus (BA 6), precentral gyrus bilaterally (BA 6, BA 44) and left supplementary motor area. Additionally, there was significant activation in middle temporal gyrus bilaterally (BA 21, BA 22), left superior temporal pole (BA 38), inferior parietal lobule bilaterally (BA 40, BA 2), right superior occipital gyrus (BA 7) extending to superior parietal lobule and left middle and superior occipital gyrus (BA 19; Table 17 & Figure 17B).

Table 17*Sentences vs. Non-Sentences: Peak Activations at $p < .05$ FWE Corrected*

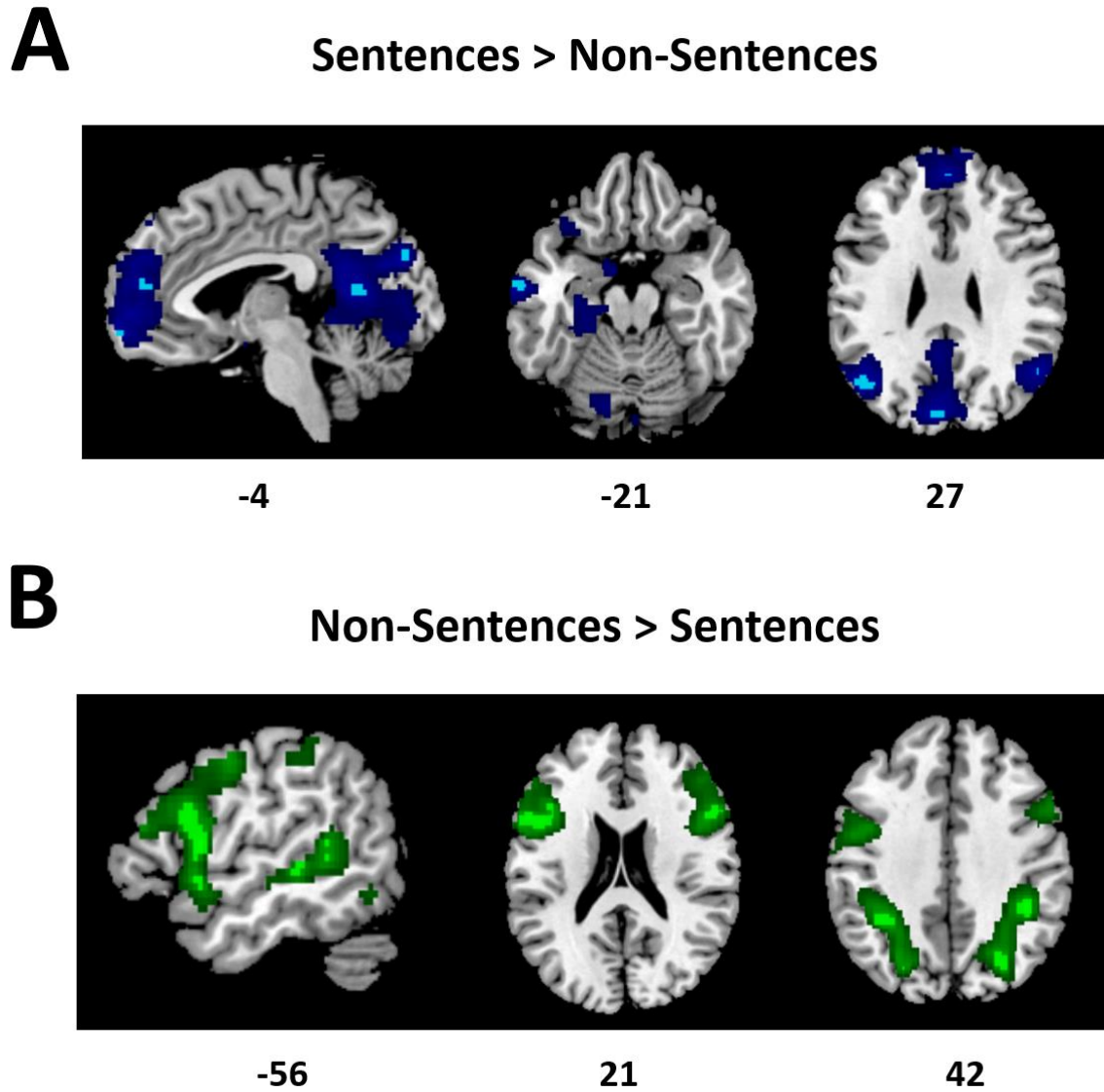
Brain Region	BA	<i>p</i> (corrected)	Z-score	Co-ordinates (MNI)		
				x	y	z
Sentences > Non-Sentences						
L angular gyrus	39	.003	5.44	-48	-68	29
L middle frontal gyrus	8	.004	5.42	-24	32	53
L middle temporal gyrus	21	.004	5.41	-64	-8	-22
L calcarine cortex	17	.007	5.28	-10	-62	11
L cuneus	18	.007	5.27	-6	-84	29
L anterior cingulate cortex	32	.009	5.22	-4	50	14
R medial orbitofrontal cortex	10	.012	5.16	4	64	-1
R angular gyrus	39	.013	5.13	52	-64	26
L lingual gyrus	18	.027	4.95	-12	-76	-13
L medial orbitofrontal cortex	11	.028	4.95	-4	64	-10
L Hippocampus	20	.030	4.93	-28	-24	-13
Medial frontal gyrus	10	.030	4.93	0	50	29
L Hippocampus	37	.034	4.90	-34	-32	-10
L Parahippocampus	30	.038	4.87	-24	-28	-16
L Cerebellum	18	.045	4.82	-14	-78	-16
L medial frontal gyrus	9	.047	4.81	-8	50	47
Non-Sentences > Sentences						
L IFG (pars opercularis)	48	< .001	6.03	-52	10	8
R inferior parietal lobule	40	< .001	5.81	42	-42	41
L inferior parietal lobule	40	< .001	5.77	-34	-50	41
R superior occipital gyrus	7	.001	5.69	30	-74	41
R superior parietal lobule	7	.005	5.63	16	-76	53
L precentral gyrus	6	.002	5.15	-42	0	50
R precentral gyrus	44	.007	5.27	54	8	32
R IFG (pars opercularis)	48	.008	5.26	54	18	20
L superior temporal pole	38	.009	5.22	-54	10	-4
L middle temporal gyrus	21	.013	5.13	-54	-32	-1
L middle frontal gyrus	6	.020	5.03	-26	-2	50
L supplementary motor area		.022	5.01	0	16	47
L superior occipital gyrus	19	.023	4.99	-24	-74	35
R inferior parietal lobule	2	.029	4.94	46	-34	53
L middle occipital gyrus	19	.034	4.90	-26	-66	35
L middle temporal gyrus	22	.041	4.85	-56	-44	5

Note. Sub-peaks that are more than 10mm from the main peak are indented. L = left; R = right;

IFG = inferior frontal gyrus.

Figure 17

Regions Demonstrating Significant Activations for the Processing of Sentences and Non-sentences Stimuli



Note. A) The light blue represents activation significant at $p < .05$ FWE corrected and dark blue represents activation at $p < .001$ uncorrected. B) The light green represents activation significant at $p < .05$ FWE corrected and dark green represents activation at $p < .001$ uncorrected.

5.3.2.2 Constraint and expectancy effects in sentence processing

A full factorial analysis, with Constraint (High constraint, Low constraint) and Expectancy (Expected, Unexpected) as independent factors, was computed to explore the effects of these variables in sentence comprehension. There was only a significant effect of expectancy, with two clusters demonstrating increased activation for sentences completed with unexpected words than expected words (Table 18 & Figure 18). They were located in the LIFG, one peaking at pars triangularis (BA 45) and the other more inferiorly at pars orbitalis (BA 38). At a lower threshold ($p < .001$ uncorrected), the activations in LIFG spread around both peaks creating a vast cluster that extended from pars triangularis (BA 45) towards the superior temporal pole (BA 38, Figure 18).

Table 18

Main Effect of Expectancy: Peak Activations at $p < .05$ FWE Corrected

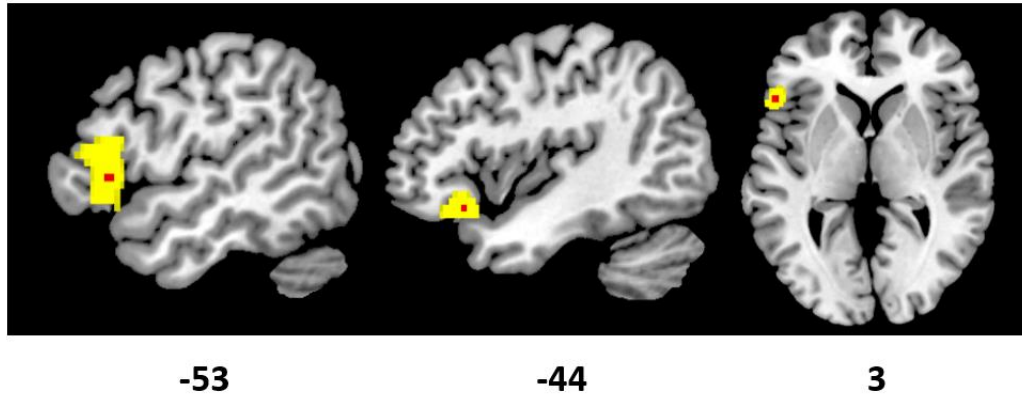
Brain Region	BA	p (corrected)	Z-score	Co-ordinates (MNI)		
				x	y	z
Unexpected > Expected						
L IFG (pars triangularis)	45	.029	4.77	-54	24	2
L IFG (pars orbitalis)	38	.032	4.71	-44	24	-13

Note. L = left; R = right; IFG = inferior frontal gyrus.

Figure 18

Main Effect of Expectancy: Unexpected vs. Expected Sentence Contrast

Unexpected > Expected



Note. The red represents activation significant at $p < .05$ FWE corrected and yellow represents activation at $p < .001$ uncorrected.

5.3.2.3 ROI analysis

The ROIs located at the anterior LIFG, at pars triangularis, and in posterior LIFG, at pars opercularis were created using the peak coordinates reported in a recent meta-analysis (Hagoort & Indefrey, 2014). As illustrated in Figure 19A, the ROIs partially overlapped with the cluster found for sentences containing unexpected words in the LIFG, notably in the pars triangularis.

The repeated-measures ANOVA conducted on the anterior LIFG ROI (Figure 19B) revealed a main effect of Expectancy ($F(1,19) = 20.50, p < .001, \eta_p^2 = .52$) and a significant Constraint by Expectancy interaction ($F(1,19) = 5.89, p < .05, \eta_p^2 = .24$). Processing sentences with unexpected ending words yielded significantly greater activation than processing sentences with expected ending words (Beta values: 1.74 vs -

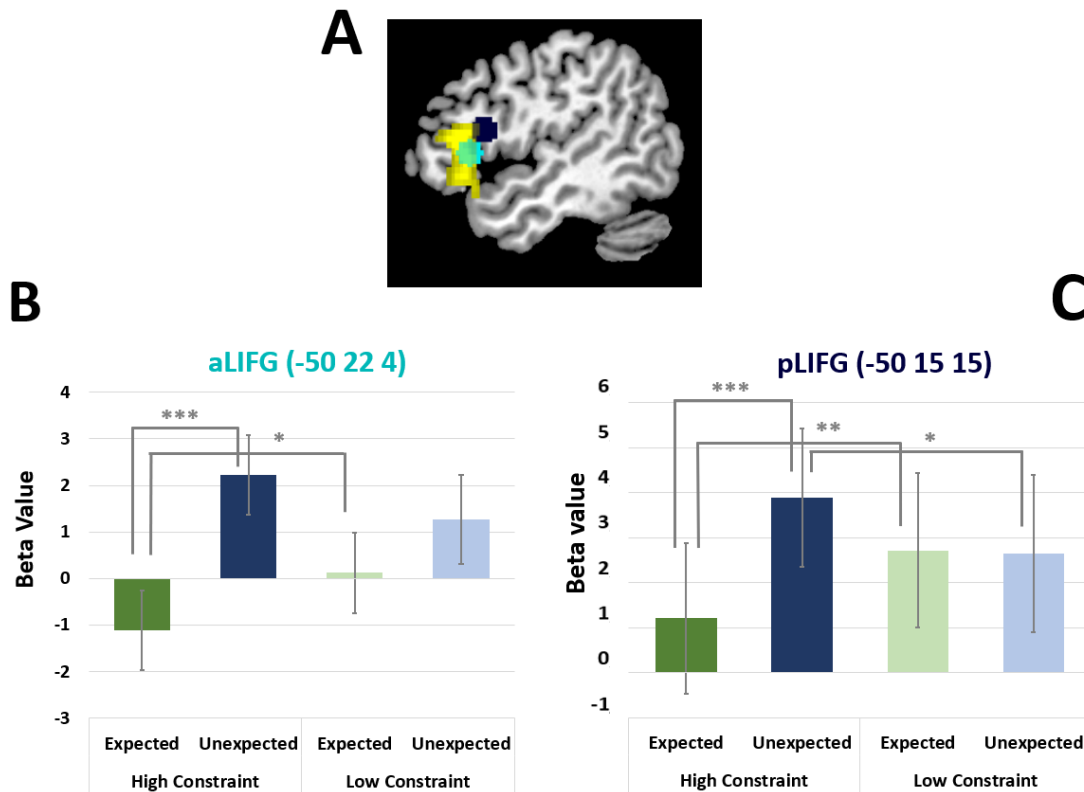
0.49¹¹, respectively). Pairwise comparisons demonstrated that this effect was only significant for the high constraint sentences ($p < .001$). Furthermore, expected words in low constraint sentences triggered more activation compared with the same words in high constraint sentences ($p < .05$).

Turning to the analysis at posterior LIFG ROI (Figure 19C), the repeated-measures ANOVA showed a main effect of Expectancy ($F(1,19) = 7.32$, $p < .05$, $\eta_p^2 = .28$), as sentences with unexpected ending words elicited significantly greater activation than sentences with expected ending words (Beta values: 3.26 vs. 1.96, respectively). We also found a significant Constraint by Expectancy interaction ($F(1,19) = 13.78$, $p < .01$, $\eta_p^2 = .42$). Planned comparisons revealed that for sentences with expected ending words, the low constraint context induced more activation compared to the high contextual constraint ($p < .01$). Conversely, for sentences with unexpected ending words the opposite was observed: there was significantly more activation for high than low constraint sentences ($p < .05$). Focusing on the high constraint condition, processing sentences with unexpected, relative to expected words, produced significantly greater activation in pars opercularis region ($p < .001$). As for the low constraint condition, word expectancy did not modulate activation in this region ($p > .9$).

¹¹ Note that the negative beta values in Figure 19 should not be interpreted as a suppression of LIFG during sentence processing (see also Ye & Zhou, 2009; Zhu et al., 2013, 2012 for similar results of negative signals). The BOLD signal values reflect relative as opposed to absolute levels of activity, such that the positive or negative value depends on the baseline, along with other predictors that are included in the statistical model (Gusnard & Raichle, 2001).

Figure 19

Constraint by Expectancy Interaction at LIFG ROIs



Note. A) Unexpected vs. Expected sentence contrast, the yellow represents activation at $p < .001$ uncorrected for the whole brain analysis. The cyan represents the anterior LIFG ROI, and the dark blue sphere represents the posterior LIFG ROI. B) Bar plot shows the beta values for each condition in anterior LIFG ROI. C) Bar plot shows the beta values for each condition in posterior LIFG ROI. Error bars illustrate standard error on the means. All significant pairwise differences (using Bonferroni-adjusted significance levels) for condition contrasts are indicated.

* $p < .05$. ** $p < .01$. *** $p < .001$.

5.4. Discussion

The goal of the present study was to investigate the neurocognitive mechanisms engaged in semantic integration during sentence comprehension. For this purpose, we presented sentences in which we orthogonally manipulated the final words' expectancy

and the sentential constraint. We found an expectancy effect, reflected by longer response times, higher proportion of errors and increased LIFG activation for sentences completed with unexpected words than with expected words. Furthermore, the ROI analysis revealed that the expectancy effect, observed at both anterior and posterior regions of LIFG, was sensitive to the sentential constraint as it was only triggered by high constraint sentences.

5.4.1. Semantic Integration: Behavioural Results

In line with earlier behavioural data (Huang et al., 2012; Kuperberg et al., 2008; Zhu et al., 2013), we found an expectancy effect, since it was more demanding (both in terms of accuracy and response times) to process sentences that were completed with unexpected than expected words. Moreover, this expectancy effect was influenced by the sentential constraint, as it was specially demanding to integrate the unexpected words when they were embedded in a context that strongly biased towards a highly predicted word. Thus, the behavioural results showed a robust facilitative influence of expectancy that is more strongly observed in highly constraining contexts.

5.4.2. Semantic Integration: Whole-Brain fMRI Results

The fMRI contrast analysis between sentences and non-sentences revealed that the processing of sentences induced activation in several areas of the left hemisphere, especially in the fronto-temporal network. However, the LIFG was not more activated for sentences; on the contrary, it was more engaged in processing of non-sentences. Similar results had also been observed in prior fMRI studies using similar stimuli, including the presentation of random lists of words, with increased LIFG activation for unstructured word lists than for sentences or lists of letters (Bulut et al., 2017; Friederici et al., 2000; Xu et al., 2005). The authors suggested that presenting unstructured word lists intermixed with sentences might prompt participants to try to rearrange the unstructured word lists,

which in turn may elicit LIFG activation. The same effect may have occurred in our study, as participants may have tried to rearrange the shuffled words into a meaningful sentence. Moreover, in our paradigm the initial words of the non-sentences respected the syntactic rules which could lead the participants to engage in unification processes, inducing enhanced LIFG activation.

In line with the behavioural data, and consistent with prior literature (e.g., Huang et al., 2012; Zhu et al., 2012), the whole brain imaging analysis revealed a significant expectancy effect. Specifically, the LIFG was more activated when participants processed sentences that were completed with an unexpected word compared to an expected one, confirming the key role of this region in semantic integration during sentence comprehension. As the expectancy effect was not modulated by the context constraint, the findings of the whole-brain analyses support the hypothesis postulated by the MUC model that LIFG is associated with semantic unification processes (e.g., Hagoort, 2005; Zhu et al., 2012). In our design, all the unexpected words were more demanding to integrate into the sentences than the expected words, as they do not fit the semantic expectations built by the prior sentential context. Additionally, the MUC model states that LIFG engagement should be parametrically modulated by the semantic unification load (e.g., Hagoort, 2005; Zhu et al., 2012). Thus, LIFG recruitment should be greater for processing sentences completed with expected words in low relative to high constraining contexts, as the former have less information biasing the reader towards a probable word. However, the absence of an interaction effect precludes a conclusion regarding differential levels of LIFG activation as a function of context constraint.

Alternatively, the conflict resolution and the two-process accounts propose that LIFG activation is elicited when multiple words or representations must be retrieved (Badre et al., 2005; Novick et al., 2005; Santi, Raposo, Frade, & Marques, 2016; Vitello

et al., 2014). Therefore, increased LIFG activation should only be observed for high constraining sentences completed with unexpected words, as in this case the context might lead to the retrieval of the strongly expected candidate, which would interfere with the selection of the word that is presented instead. The results of the whole-brain analyses showed that the expectancy effect is not influenced by the degree of context constraint, which does not provide support to this proposal.

These findings are more congruent with the hypothesis that LIFG is critical to integrate words that are not supported by the sentence context, as postulated by the MUC model. As the whole-brain analyses with a factorial design may conceal the pattern of activation across conditions, it is frequently beneficial to extract the signal in specific areas of interest for each condition using a priori defined ROIs (e.g., Hupé, 2015; Poldrack, 2007).

5.4.3. The Influence of Sentential Constraint on Semantic Integration: ROI Analysis

The ROI analysis demonstrated that the enrolment of LIFG during semantic integration is not only modulated by words' expectancy, but also by the sentence context constraint. In the anterior LIFG, we found that processing sentences completed with unexpected words induced increased activation of this region compared to sentences ending with expected words. Importantly, this expectancy effect was only significant for sentences with high constraint contexts. Furthermore, there was also an impact of sentential context in the integration of the expected words, since expected words in low constraining contexts triggered greater anterior LIFG activation than expected words in high constraining contexts. These results are partially consistent with the MUC hypothesis that proposes that anterior LIFG is responsible for the integration of words

that are less supported by the previous context (in our case, sentences completed with unexpected words and sentences completed with expected words in weakly constraining contexts). According to the MUC model, we should also have observed increased anterior LIFG activation for unexpected words (relative to expected words) in low constraining contexts, as these words are also not supported by the context. Yet, the interaction effect revealed that the expectancy effect only emerged in high constraining sentences, which does not fit the prediction.

Alternatively, our findings support the role of anterior LIFG in semantic retrieval, as postulated by the two-processes framework (Badre et al., 2005; Badre & Wagner, 2007). Anterior LIFG was recruited to a lesser extent when readers processed sentences that required less effort to retrieve the ending words, i.e., sentences with high constraining contexts completed the expected words. In these sentences, as there was a strongly supportive context prior to the critical words, it was easier to retrieve the expected word contrastingly with words that were unexpected and with words that were expected but appeared in less biased sentential contexts. These findings are congruent with previous studies that showed reduced activation of anterior LIFG for words that were previously primed (e.g., Gold et al., 2006; Ruff, Blumstein, Myers, & Hutchison, 2008) and transcranial magnetic stimulation studies that have shown that the disruption of LIFG interfered with semantic retrieval (Gough et al., 2005; Krieger-Redwood & Jefferies, 2014; Whitney, Kirk, O'Sullivan, Lambon Ralph, & Jefferies, 2011).

The ROI analysis at posterior LIFG also revealed an expectancy effect that was restricted to the high constraint sentences. Additionally, there was an increased activation of posterior LIFG for sentences completed with expected words in low than in high constraining contexts. In contrast, sentences completed with unexpected words triggered more posterior LIFG activation in high than in low constraint sentences. Even though in

the whole-brain analysis the expectancy effect had a more anterior and ventral location, peaking in pars triangularis and orbitalis, the ROI analysis showed that activation also spread towards posterior portions of the LIFG. Thus, the posterior LIFG seems to be also influenced by the semantic integration demands during sentence comprehension. These results are not fully consistent with the MUC model, since in Hagoort's proposal the posterior LIFG supports syntactic and phonological rather than semantic processing (Hagoort, 2005). However, in line with our findings, prior studies exploring expectancy (Huang et al., 2012) and ambiguity effects (e.g., Rodd, Johnsrude, & Davis, 2012; Zempleni et al., 2007) in sentence comprehension have found increased activation of posterior LIFG for sentences that require higher semantic processing demands.

Following the two-process framework that states that the posterior LIFG is related with selection processes (Badre et al., 2005; Badre & Wagner, 2007), we hypothesized that high constraint sentences completed with unexpected words would lead to increased activation of this region. Since sentences with high constraining contexts are likely to induce the automatic retrieval of the strongly expected word (e.g., DeLong et al., 2005; Laszlo & Federmeier, 2009; Szewczyk & Schriefers, 2013), when those sentences are completed with an alternative word, both words (the highly expected and the unexpected word) are retrieved, but only the presented word has to be selected and integrated into the sentence. Even though our design and the low temporal resolution of fMRI do not allow us to infer if participants were using anticipatory mechanisms, there is consistent evidence that, at least under some circumstances in order to optimize language comprehension, readers predict upcoming words using the sentential information (Huettig & Mani, 2016; Kuperberg & Jaeger, 2016, for a review). Our findings demonstrated that there is greater posterior LIFG engagement only for high constraint sentences, which means that only sentences that had a strongly expectable word recruited this region. In contrast, for

sentences with less biased sentential context, that do not have a strong expectable word, posterior LIFG activity did not differ as a function of the expectancy of the ending words.

Even though we did not predict a crossover interaction between context constraint and final word expectancy in posterior LIFG, our data can be accommodated by the assumptions of the two-process framework. For sentences completed with expected words, a less biased context may induce the retrieval of more than one candidate, as readers can anticipate multiple probable candidates (see probabilistic parallel proposal by DeLong et al., 2005). For example, the low constraint sentence “The elderly sometimes lose their...”¹² the most expected word is ‘minds’ having a cloze probability of .30, yet participants often respond with different words such as ‘memory’ (CP = .24) and ‘hearing’ (CP = .19). As seen in this example, the readers in the low constraining sentences can retrieve multiple probable candidates leading to the competition among them and the need for selection processes. In addition, readers may retrieve only one expected candidate, yet it might not be the most expected word (e.g., the readers may anticipate the word ‘memory’ instead of ‘minds’), since frequently those sentences have several candidates with a closer expectancy degree. In this scenario, it would also be likely that the two words (the word that readers anticipate and the presented word) compete during word integration processes. On the contrary, in high constraint sentences the readers are biased towards a strongly expected word, leading to the retrieval of that specific word, so selection processes are not required. These findings are congruent with previous priming studies that showed an increased activation of posterior LIFG for words that were preceded by unrelated words (e.g., Gold et al., 2006). Moreover, research with patients have demonstrated that damages of LIFG affect the ability to resolve competition during word access in naming tasks (Schnur et al., 2009). Concerning the sentences

¹² Examples from the dataset of Bloom & Fischer (1980).

completed with unexpected words, the increased activation found for high relative to low constraining context sentences can be attributed to the difference in the strength of the activation of the retrieved candidates. Whereas the unexpected word in low constraint compete with weakly expected words, in high constraint the words are strongly expected, thus it may be harder to select and integrate the unexpected words.

In sum, the results showed that both anterior and posterior regions of LIFG are engaged during semantic integration and that the degree of activation is modulated by the words' expectancy and the sentential constraint. Our results revealed that anterior LIFG is recruited to a lesser extent when the ending words are easier to retrieve or integrate. Additionally, posterior LIFG activation increased when readers processed sentences that might had prompted the retrieval of more than one word. Together, these findings are congruent with the two-process framework.

5.4.4. Limitations and Future Studies

In this study we opted to present the sentences in a more naturalistic form, i.e., the whole sentence at once. This method differs from the more frequently word-by-word paradigm used in previous fMRI studies that have explored semantic integration during sentence comprehension (Huang et al., 2012; Kuperberg et al., 2008; Zhu et al., 2013, 2012). Yet, some authors defend that whole sentence presentation is a more appropriate paradigm to use with fMRI, compared with word-by-word, given that the activation associated to the individual words cannot be estimated due to the slowness of the hemodynamic response (Humphreys & Gennari, 2014). Additionally, whole-sentence presentation has been successfully used in several studies exploring sentence comprehension processes (e.g., Caplan, Stanczak, & Waters, 2008; Humphreys & Gennari, 2014; Marques, Canessa, & Cappa, 2009; Raposo & Marques, 2013). As long as the design assures that all the sentences are fully matched between conditions and only

differing in the critical aspect, it allows the analysis of the specific processes of interest. In our design the same context was used to compare the integration of expected and unexpected words, while the high and low constraint sentences had a similar size and were as similar as possible. Moreover, the sentence verification task used was selected to ensure that there were no different responses (i.e., “yes” or “no”) in processing our critical stimuli – the sentences – which reduces the confounds that may be created by decision requirements (for further discussion see Huang et al., 2012). Importantly, using this different method, we confirmed that it is possible to use a more naturalistic sentence presentation to study semantic integration processes, as we have found similar expectancy effects as those reported in prior studies (Huang et al., 2012). In the future, to obtain a more detailed information about how the reader processes each word of the sentence, fMRI data acquisition could be combined with eye-tracking, which would allow for the measurement of eye movements and to integrate that information with the neuronal data (for similar approach see, Schuster, Hawelka, Hutzler, Kronbichler, & Richlan, 2016)

5.5. Conclusion

Our behavioural and neuroimaging data converge in showing that word integration during sentence processing is modulated by the word’s expectancy and the constraint of the preceding context. Our fMRI findings support the functional dissociation of LIFG put forward by the two-process account, which proposes that anterior LIFG is associated with semantic retrieval whereas the posterior LIFG is recruited to select a candidate among simultaneously retrieved representations.

6. GENERAL DISCUSSION

The current thesis aimed to bring new knowledge on the cognitive and neural processes underlying word integration during sentence comprehension. For that, we explored the impact of sentence context and a word's expectancy on the retrieval and integration of that word with the sentence context.

A large number of studies have shown that expected words are more easily and rapidly activated and then integrated into the sentence compared to unexpected words (e.g., Forster, 1981; Rayner, Slattery, & Drieghe, 2011; Simpson et al., 1989; Stanovich & West, 1981). These findings may reflect the eased integration of words when they appear in a sentential context that supports them (Hagoort, 2006; Jackendoff, 2007) and/or can arise from predictive mechanisms that allow readers to pre-activate expected words or at least some of their properties (Kuperberg & Jaeger, 2016; Kutas, DeLong, & Smith, 2011). Our studies were built to identify the contribution that each of these mechanisms make and to investigate how predictive mechanisms are implemented in real time language processing.

6.1 Summary of the Main Findings

6.1.1 Building a Sentence Database

Chapter 2 presents a validation of a large set of sentence completion norms for European Portuguese. These materials provide a methodological contribution to the field, as they will be made available for future use in psycholinguistic experiments. This database additionally provided the materials for the current experiments.

The single cloze probability, i.e., the proportion of first valid responses that used that specific word to complete the sentence fragment, was used to select the sentences for the following studies. For each sentence, two other complementary measures were

computed: type-token ratio and proportion of idiosyncratic responses. Both measures were correlated with single cloze probability, since the sentences with higher cloze probability had fewer words used to complete the sentences (lower type-token ratio) and had lower proportion of idiosyncratic responses. These measures offer more specific information regarding sentence constraint, notably about the number and type of words used to complete each sentential fragment. Two paradigms, the classical single-production (in a paper-and-pencil protocol) and the multiple-production (in a computer-based task), and two estimation methods, the single method (where only the first response was analysed) and the multiple method (where the three responses were considered) were used. The comparison between both paradigms and methods revealed that the scores were highly consistent, thus demonstrating the reliability of cloze procedures values.

Even though cloze probability has become one of the most widely used tasks to explore prediction and integration mechanisms during sentence comprehension, it is unclear how the cloze probability scores map onto speakers/readers' actual estimate of word likelihood. In the sentence "He scraped the cold food from his", the word "plate" has a cloze probability of .8 and the word "spoon" has a cloze probability of .2. One hypothesis is that there are two distinct groups of participants, with approximately 80% belonging to the group that completed the sentence with the word "plate", and the other 20% belonging to the group that estimated "spoon" as the most expected word. Alternatively, most researchers have assumed that the cloze probability indexes the probabilities in the mind of participants, such that "plate" is generally a more probable completion than "spoon". It is methodologically challenging to disentangle the two hypotheses, particularly when using the single cloze probability paradigm. In the multiple cloze probabilities paradigm, however, used in Experiment 2, each participant completes the sentence fragment with up to three most expected words, and thus one may verify if

most people that use the word “plate” for the first completion use the word “spoon” as the second or the third completion. Regarding the 90 sentences selected for studies of Chapters 3 and 4 we observed that almost half of the participants that complete the first response with the most expected word, used as the second or the third response the second-best word (which was defined as the second most frequent answer considering only the first response). Thus, our data is more consistent with the proposal that cloze probabilities mirror the participant’s probabilities of each word to be used in that context.

6.1.2 Expectancy Effects: Extension and Moderators

In Chapter 3, the self-paced moving window paradigm was employed to explore the extension of the expectancy effects, namely if all expectable words were processed faster than unexpected words or if only the processing of the most expected word was facilitated. In addition, we investigated if those expectancy effects were affected by task demands or by individual differences across participants.

The results showed a facilitatory effect for all the expectable candidates, i.e., to the most expected and to the second-best words. These effects were observed only at the spill-over region, at the first and second word following the target. The absence of the effects on the target words (i.e., on expected and second-best words) challenges the hypothesis that those expectancy effects are associated with anticipatory mechanisms, as they were only observed later on, after the processing of the target words. This, along with the fact that an expectancy effect was found for the second-best words is in line with the view that the previous context facilitates integration processes, which occur later in the sentence and for all expectable candidates. However, one should bear in mind that the reading times in the self-paced moving window paradigm are not a direct measure of the reading process, since they may also be affected by other factors, such as motor action. Additionally, the systematic pressing of one key to see the next word can lead to rapid

and automatic pressing, which may reduce the impact of word or context variables. It is worth noting that the mean reading time of the target words in our study was merely 273ms, which is considerably lower than the mean reading times found in previous studies (293ms in Brother et al., 2017; 330ms in Hintz et al, 2016; 496 for the high constraint sentences for the participants with higher literacy in Ng et al., 2017). Therefore, the fact that the expectancy effects only appear at the spill-over region could be partially attributed to the transfer of the processing effects of the target words to the subsequent words, since reading times were so short that they did not allow for a complete word retrieval and/or integration. To better understand the cognitive mechanisms underlying these expectancy effects we ran the third study of this dissertation, collecting data using an online measure that does not require a behavioural response - the EEG.

This behavioural study also showed that the processes underlying the expectancy effects were not modulated by task demands or reader's strategy, since the manipulation of the initial set of filler sentences did not impact the reading times of the upcoming sentences. Moreover, individual differences in working memory capacity and in reading abilities did not affect consistently the processing of the target words or the following words. Together, this evidence demonstrates that the expectancy effect is robust, extends to all readers and is not affected by task demands.

6.1.3 Disentangling Early and Late Processes

To better grasp the timing and the electrophysiological correlates of the cognitive processes involved in word retrieval and/or integration during sentence comprehension, we ran an EEG study, that was presented in Chapter 4. This provided an opportunity to overcome some limitations of the behavioural task presented in Chapter 3. The same materials were used, with the difference that the filler sentences were not presented, as

we did not find any significant impact of those on the processing of the target words in the behavioural study.

The results revealed a facilitation effect for both expected and second-best words indexed by a less negative N400 amplitude relative to unexpected words. However, the effect for the second-best words was delayed and weaker, only reaching significance at the 400-500ms time window, but not the 300-400ms one. The early expectancy effect found for the most expected words, arising at 300ms after the onset of the target word, suggests that the process indexed by this component is related with earlier stages of sentence processing, such as word retrieval. Moreover, if the N400 was triggered only by demands on word integration, we should have observed a similar effect for most expected and second-best, i.e., a similar timing and amplitude of N400, as they are both supported by the sentence context and have similar plausibility scores. The early expectancy effect found exclusively for the most expected word is congruent with robust evidence, either direct (e.g., DeLong et al., 2005; Otten, Nieuwland, & Van Berkum, 2007; Szewczyk & Schriefers, 2013) or indirect (Federmeier, Kutas, & Schul, 2010; Federmeier et al., 2007; Ito et al., 2016; Van Berkum et al., 2005) that the expectancy effects are associated with predictive mechanisms. These mechanisms allow readers to pre-activate words, at least in high constraint sentences. Our data demonstrates that initially the facilitation effect is restricted to the most expected word, whereas the delayed facilitation effect found for second-best words suggests that readers can rapidly shift their estimation towards other probable words.

Moreover, in the PNP analysis, we observed that processing unexpected words requires additional effort, indexed by a more positive PNP amplitude for unexpected compared with expected words. This result may suggest that the PNP is triggered by the candidate word increasing integration effort or leading to a re-analysis or re-interpretation

of the sentence meaning (e.g., “Nuno went to see the new exhibition of that palace”, in this context the most expected word is “painter”). The second-best words, as they are expected and often share semantic features with the most expected words, are less likely to prompt a re-interpretation of the sentence, at least in most of our sentences (e.g., “Nuno went to see the new exhibition of that artist”). Yet, the alternative proposal that this component might be triggered by the suppression or inhibition of the predicted word cannot be completely excluded. Our initial hypothesis was that if there was a commitment towards the most expected word, when any other word appeared that would induce the suppression or inhibition of the (wrongly) pre-activated word (i.e., most expected word). However, the N400 results showed an expectancy effect also for second-best words, which supports probable words being rapidly retrieved. Since the PNP normally arises 600ms from word onset, this component might not be affected by the suppression of the second-best words, since their retrieval had begun approximately 200ms before.

6.1.4 The Critical Role of the LIFG

The study presented in Chapter 5 investigated the neural underpinnings of the expectancy effect with a focus on the LIFG. Two sets of sentences were selected from our norming dataset that differed in the degree of context constraint – one of the sets had high constraint sentences (CP = .88) and the other set had low constraint sentences (CP = .44). The selection of sentences with a higher constraint ensured that these sentences prompted the pre-activation of strongly expected words. Conversely, in the lower constraint set there was a reduced probability of pre-activating words or at least of pre-activating a specific word.

The results revealed an expectancy effect in the LIFG, i.e., this region was more engaged when participants processed sentences that were completed with an unexpected word compared to an expected word. The ROI analysis showed that in the anterior LIFG,

the expectancy effect was only significant for high constraint sentences and that the expected words triggered more activation in low than in high constraint sentences. These findings are congruent with the proposal that the anterior LIFG is involved in semantic retrieval: conditions that place greater demands on semantic retrieval elicit more activation in the LIFG. In the posterior LIFG there was also an expectancy effect restricted to high constraint sentences. Furthermore, the expected words triggered more activation in this region in low than in high constraint sentences, whereas unexpected words showed an enhanced activation in highly constraining sentences compared with lowly constraining sentences. These results suggest that the posterior LIFG was recruited by sentences that endorsed the retrieval of multiple words and, thus, demanded a greater effort to select and integrate the unexpected presented word. The difference found for sentences with unexpected words in high vs. low constraint context suggest that the conflict is amplified when the expected words are more strongly expected.

6.1.5 Empirical Findings Overview

Taken together, the results from the studies presented in this thesis confirm that the sentential context is actively used during sentence comprehension to ease the access and integration of expectable upcoming words. This expectancy effect was found for all expectable words and seems to be mainly associated with facilitating word retrieval. These findings are congruent with prior literature that demonstrated that the language system uses anticipatory mechanisms to access word information, and even to pre-activate specific words, at least in highly constraining sentences (e.g., DeLong et al., 2005; Federmeier et al., 2007; Ito et al., 2016; Szewczyk & Schriefers, 2013; Wicha, Bates, Moreno, & Kutas, 2003). Noteworthy, the data from our experiments showed that the anticipation is initially committed towards the most expected word, since the facilitation for less probable words (i.e., second-best) only happens in a later stage of the

processing, as revealed by a late N400 effect. Moreover, the results showed that these anticipatory mechanisms trigger additional processing costs when the prediction is disconfirmed as evidenced by the higher amplitude of PNP component and the increased activation of LIFG for the unexpected words. The activation of unexpected words seems to require the suppression and/or inhibition of the pre-activated expected word, especially in highly constraining sentences. These processes correlated with posterior LIFG activation, whereas the anterior LIFG activation was associated with word retrieval processes. Additionally, unexpected words may demand increased integration effort, since they are less plausible completions and are less supported by the sentence context.

6.2. Implications for Language Comprehension Models

6.2.1 Predictive Mechanisms: A Trade-off

Models of language comprehension propose that contextual facilitation effects are associated with predictive mechanisms (Ferreira & Chantavarin, 2018; Kuperberg & Jaeger, 2016; Kutas & Federmeier, 2000; Lee & Federmeier, 2009; Pickering & Garrod, 2013), at least in part. In complement, the sentential context might also posit a significant role specifically in word integration processes. Yet, the impact of context in each of these processes, how predictive and integrative mechanisms are implemented and interact is still a matter of debate.

Traditionally, in linguistics it has been argued that prediction plays only a minor role in language comprehension, since predictive mechanisms would involve costs that are frequently not worth pursuing (Jackendoff, 2007). Often, there are many possible completions for a sentential fragment and the pre-activation of such candidates would consume resources that could be allocated to other processes. Additionally, a disconfirmed prediction can also lead to an additional processing cost, such as inhibition

or suppression of the wrongly pre-activated word (Kuperberg & Jaeger, 2016; Van Petten & Luka, 2012, for discussion review). Yet, prediction has grown to be considered as an important pillar of language comprehension, given the increasing evidence in support of these processes (Altmann & Kamide, 1999; Cutting & Scarborough, 2006; DeLong et al., 2005; Szewczyk & Schriefers, 2013; Tanenhaus, Spivey-Knowlton, Eberhard, & Sedivy, 1995). Almost all models of lexico-semantic processing posit that the reader can anticipate some information prior to encountering the upcoming word (Altmann & Mirković, 2009; Kuperberg & Jaeger, 2016). Moreover, in high constraint sentences the representations that are pre-activated are highly specific and readers may pre-activate a particular word (Brothers et al., 2015; DeLong et al., 2005; Kwon et al., 2017; Laszlo & Federmeier, 2009). Still, there are several questions that remain unclear and this thesis attempted answering them. Is prediction an automatic feature or a process that readers, consciously or unconsciously, prompt to optimize sentence comprehension? Does working memory and reading ability mediate predictive mechanisms? Is prediction exclusively generated for a specific candidate or are multiple expectable candidates anticipated? What are the costs associated with a disconfirmed prediction?

The expectancy effects found in the behavioural and EEG studies are consistent with prior literature (e.g., Brothers et al., 2017; Federmeier et al., 2007; Hintz et al., 2016; Kutas & Hillyard, 1984). Additionally, they demonstrate that the processing of less expectable words is also facilitated, demonstrating that readers pre-activate multiple expected words. Nonetheless, the timings for activating the most expected and second-best words differed. Early on (i.e., between 300ms to 400ms after the word onset), facilitation was only observed for the most expected word, which is inconsistent with accounts that state that all expectable words are pre-activated. Notably the probabilistic parallel proposal, which suggest that there might be a graded facilitation effect according

with the expectancy level of words, reflected by a different magnitude of N400, do not assume any temporal distinction in the activation of expectable words. This result also suggests that the expectancy effect is not exclusively accounted by integration processes. According to this view, as the sentence context provides support to both expected and second-best words, there should have been no delayed facilitation for less, but still expectable words. Instead, the findings of these studies fit the serial graded proposal for prediction mechanisms that argue that prediction is initially oriented only for the most expected word and that only if this prediction is disconfirmed the system can update the predictions towards other probable candidates (Thornhill & Van Petten, 2012). This proposal assumes a less costly prediction, since pre-activation applies to a single word and requires less resources compared to pre-activating multiple candidates. However, this commitment towards a specific candidate may lead to an increased response time or additional neural activity when the upcoming words mismatch the pre-activated word.

The findings of the EEG and fMRI studies confirm that readers face additional demands to retrieve and/or integrate unexpected words. Even though these words provide semantically and syntactically valid completions of the sentence, they are not commonly used to complete the sentences (i.e., their CP is minimal). Their low expectancy affects sentence plausibility, as sentences completed with unexpected words were judged as less plausible than sentences completed with expected and second-best words (as shown in section 4.3.1.2). This presumably increases the effort of processing unexpected words, especially in regards to their integration, as revealed by the PNP component and LIFG activation. Importantly, the effects observed in the LIFG suggest that unexpected words not only impose an additional demand on semantic integration, but also compete to be retrieved and integrated when other words are active. Readers pre-activate the expected words, therefore when an unexpected word is presented, the system must suppress or

inhibit the word that was already activated. Some models assume that the pre-activation level of words that are then not presented decays naturally and do not impose any additional processes to the language system. However, our data do not support this view, since we found increased activation of posterior LIFG for high constraint sentences completed with unexpected words, a region that has been proposed to be associated with selecting among multiple candidates.

Together, these findings show that predictive mechanisms activate expectable candidates in a serial graded way. Our results highlight the trade-off between the advantages and costs of predictive mechanisms. On the one hand, anticipatory retrieval benefits reading when expectable words are presented. On the other hand, when predictions are disconfirmed, there is a slowdown on reading times caused by increased demands in word integration, and the need to suppress or inhibit the mistakenly pre-activated word.

6.2.2 Predictive Mechanisms Are Involved Across Tasks and Participants

Our findings argue against the hypothesis that readers can adapt their reading processes (Brothers et al., 2017; Hintz et al., 2016; Huettig, 2015), such as the likelihood of using anticipatory processes to optimize sentence comprehension. In our second study, by manipulating a set of filler sentences, we created conditions in which engaging in anticipatory processes would be disadvantageous, as most sentences presented were completed with unexpected words, whereas in other conditions those processes would be beneficial, since all the sentences were completed with strongly expected words. Reading times were not affected by the type of filler sentences, i.e., the facilitatory effects for the most expected words and for the second-best words was similar between groups. It is

worth noting, as discussed previously, that the expectancy effect observed in this task only emerged in the spill-over region, thus being less sensitive to word access processes, and instead might reflect to a greater extent word integration process.

Some authors have proposed that prediction mechanisms are mediated by participants' abilities, such as working memory or reading abilities (Huettig, 2015; Huettig & Brouwer, 2015; Mani & Huettig, 2014). Our findings do not corroborate this hypothesis, as in the behavioural study neither working memory capacity nor reading abilities of the participant were a consistent predictor of the magnitude of the expectancy effects. Yet, this result may not generalize to the rest of the population, since participants of this study were all undergraduate students with at least 12 years of formal education. Therefore, they may have an enhanced level of reading ability and even of working memory capacity and the variability found in our study might have not be sufficient to detect the effect.

In summary, language comprehension models must consider that the involvement of predictive mechanisms is natural and non-strategic. Readers seem to be unable to adjust the weight of predictive mechanisms during sentence reading to optimize the trade-off of the benefits *vs.* costs of these mechanisms. In addition, predictive mechanisms are not modulated by participants' abilities, such as working memory and reading skill, at least when they are fluent readers with several years of formal education.

6.3. Future Directions

The present work combined behavioural, electrophysiological and neural activation methods to investigate expectancy effects in language comprehension. We believe that this multi-modal approach is a fruitful way to address language processing questions. Simultaneously, it prompts several future avenues of research.

The empirical studies of this dissertation measured, using distinct methodologies, the processing of the target words embedded in more or less constraining sentences. Our manipulation, as in several previous studies, does not provide direct evidence of the predictive mechanism, since we only captured the effects occurring after the onset of the target word. In future research, to directly examine the predictive mechanisms it would be necessary to manipulate words presented before the target words, such as articles that have to match in gender and number in European Portuguese. Yet, the prediction hypothesis is supported in our findings considering the early effects found in the EEG study (Chapter 4) and previous evidences reported in the literature.

The cloze probability is one of the most widely used measure to access word expectancy in a sentence. This explicit language production task, as demonstrated in the results of Chapter 2, provides measures that are consistent across paradigms. Yet, when accessing cloze probability for low constraining context, as the context provides scarce information, the score of the words used more frequently to complete those sentential contexts might not completely capture the degree of facilitation for integrate those words. Specially in these cases, it may be useful to add complementary measures based on language corpora on data analysis, such as forward transitional probability (e.g., Frisson et al., 2005; McDonald & Shillcock, 2003), surprisal (e.g., Agrawal, Agarwal, & Husain, 2017; Delaney-Busch, Lau, Morgan, & Kuperberg, 2017; Frank et al., 2015) or entropy (e.g., Frank et al., 2015; Willems et al., 2016; Yun et al., 2012).

The behavioural study using the moving-window paradigm showed that readers did not suppress anticipatory mechanisms when they were not beneficial to the task at hand (Brothers et al., 2017; Kuperberg & Jaeger, 2016). This result is inconsistent with prior literature (Brothers et al., 2017) and might have been affected by the faster reading times that may not have been sensitive enough to capture the impact of the retrieval processes

on the target words. To completely discard the hypothesis that the retrieval processes may be influenced by task demands, it would be useful to select a behavioural task that promotes a complete processing of each word before the appearance of the next word or to use a technique that allows a more fine-grained temporal resolution, namely eye-tracking while reading.

An issue that we did not address concerns the specificity of the predictive mechanisms in low constraining sentences. Only in the study of Chapter 5 we present low constraining sentences that were completed either with an expected or unexpected word. There was an increased activation of the posterior LIFG when processing sentences completed with an expected word in low than in high constraint contexts. It is plausible that during the processing of low constraining sentences, readers retrieve one expected candidate, but this may not be the most expected word at the population level, since frequently these sentences have several candidates with a close expectancy degree (ie, CP). This may induce competition between the pre-activated word and the presented word. The low temporal resolution of fMRI and the presentation of only the most expected word makes it difficult to understand if readers were committed to a specific candidate. Some authors argue that predictive mechanisms are only used in high constraint sentences and might be more frequently observed in sentence comprehension studies than in natural language, namely texts or conversations, since the materials used in these studies have a higher proportion of highly constraining sentences (Huettig & Mani, 2016). Yet, our findings suggest that even in less constraining sentences the readers can engage in predictive mechanisms. In future studies, using techniques with a high temporal resolution, it would be interesting to examine if there are early expectancy effects in an ERP study for the most expected words of low constraint sentences, thus confirming that predictive mechanisms are also implemented in those sentences.

In the EEG study, the PNP component analysis revealed a weak trend towards a more positive mean amplitude for unexpected words relative to expected ones. Some authors have proposed that this component reflects additional operations that take place when strong predictions are disconfirmed, namely suppression or inhibition of the predicted word (Federmeier et al., 2007; Van Petten & Luka, 2012). This proposal has some resemblances with the functional role attributed to the posterior LIFG by the conflict resolution framework (Novick et al., 2009, 2005). In future research, using a methodology that maps the ERP components onto brain regions, such as magnetoencephalography, it may be interesting to test if the activity of the posterior region of LIFG is triggering this frontal late positivity component.

6.4 Conclusions

Investigating sentence comprehension processes is essential to better understand the complex and dynamic processes engaged in language comprehension. The multimodal approach of this thesis built a more complete picture of the processes involved in word retrieval and integration during sentence comprehension, since several features, namely timing and neural activation, were investigated.

The results demonstrate that sentence context and word's expectation affect both the retrieval process, mainly due to the predictive mechanisms, and the integration process. Our findings confirm that all expectable candidates, even the second-best ones, are more easily retrieved, due to the predictive mechanisms. This influence on the retrieval process can then minimize the demand during word integration. Notably, predictive mechanisms seem to be automatically triggered, at least in high constraint sentence contexts, and are not modulated by task demands or participants abilities. The unexpected words, that are unlikely to be predicted by readers, impact the demands on

word integration and recruit process to solve the conflict of having multiple words activated.

These studies may contribute to the revision and improvement of the current models of language comprehension. Furthermore, they may seed future research in several domains, such as linguistic, neuroscience and natural language processing.

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Appendix A – Completion Norms Dataset

Table 1

Sentence fragments of Experiment 1 listed in order of descending cloze probability of the most frequent response. The cloze probability value appears after each word in parenthesis. The column ‘Other Responses’ lists all the other words used to complete the sentence fragments with their cloze probability in parenthesis.

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
1	Antes de entrar o Filipe limpou os pés no	Tapete (1)	
2	A Sandra não se aproximava de cães porque tinha	Medo (1)	
3	O menino queria um telescópio para ver as	Estrelas (1)	
4	O Júlio foi à biblioteca requisitar um	Livro (1)	
5	A mãe pediu-lhe para arrumar as meias naquela	Gaveta (1)	
6	Antes da refeição os meninos foram lavar as	Mãos (1)	
7	O pai pediu-lhe para antes de se deitar desligar as	Luzes (1)	
8	Como o bebé estava a chorar foram trocar-lhe a	Fralda (1)	
9	A Rute brincava com a areia e tentava fazer um	Castelo (0.967)	Anjo (0.033)
10	O Salvador convidou-a para ver uma peça de	Teatro (0.967)	Arte (0.033)
11	A Andreia pedia sempre um café e um pastel de	Nata (0.967)	Belém (0.033)
12	O Guilherme foi ao parque passear o	Cão (0.967)	Gato (0.033)
13	Como ficou com caspa teve de comprar um novo	Shampoo (0.967)	Capachinho (0.033)
14	O menino ficou de castigo porque tinha dito uma	Asneira (0.967)	Maldade (0.033)
15	A menina pintou as unhas com o novo	Verniz (0.967)	Pincel (0.033)
16	Quando estava a brincar o menino rasgou as	Calças (0.967)	Meias (0.033)
17	A mãe disse-lhe para lavar os dentes e vestir o	Pijama (0.9)	Casaco (0.1)
18	O António colocou mais lenha na	Lareira (0.633)	Fogueira (0.367)
19	Quando ia comer a sopa reparou que não tinha	Colher (0.968)	Sopa (0.032)
20	O bebé sujou o babete a comer a	Sopa (0.516)	Papa (0.484)
21	Depois de limpar a cozinha arrumou a pá e a	Vassoura (0.966)	Esfregona (0.034)
22	O cão ficou toda a tarde entretido a roer um	Osso (0.968)	Sapato (0.032)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
23	A professora pediu-lhe para ler um excerto daquele	Livro (0.548)	Texto (0.452)
24	O Alberto colocava sempre no café uma colher de	Açúcar (0.968)	Chá (0.032)
25	A Raquel era tímida e tinha dificuldades em fazer novas	Amizades (0.839)	Amigas (0.161)
26	O Tiago depois da corrida ficou com dores nas	Costas (0.548)	Pernas (0.452)
27	Antes de dormir a menina pediu-lhe para contar uma	História (0.968)	Aventura (0.032)
28	Depois de mexer bem os ingredientes colocou o bolo no	Forno (0.967)	Congelador (0.033)
29	O Gaspar quando viu o famoso cantor pediu-lhe um	Autógrafo (0.933)	Abraço (0.067)
30	A Carla costuma ver televisão deitada no	Sofá (0.968)	Chão (0.032)
31	A Fernanda saiu a correr e esqueceu-se de fechar a	Porta (0.968)	Janela (0.032)
32	A professora disse-lhe que o seu texto tinha muitos	Erros (0.967)	Defeitos (0.033)
33	O Luís colocou mais alto o rádio para ouvir melhor a	Música (0.931)	Notícia (0.069)
34	Os miúdos estavam contentes porque era o último dia de	Aulas (0.931)	Escola (0.069)
35	Antes de cozinhar a Antónia vestia sempre um	Avental (0.966)	Vestido (0.034)
36	A Beatriz recebeu muitos presentes no seu dia de	Anos (0.586)	Aniversário (0.414)
37	Como tinha sede o menino pediu-lhe um copo de	Água (0.935)	Sumo (0.065)
38	Antes de dormir a avó lia a	História (0.6)	Bíblia (0.267) Revista (0.133)
39	A Filipa colocou os pratos em cima da	Mesa (0.833)	Bancada (0.133) Prateleira (0.033)
40	A professora aconselhou-o a fazer as contas usando a	Calculadora (0.774)	Cabeça (0.161) Máquina (0.065)
41	A pequena carroça era puxada por um	Burro (0.484)	Cavalo (0.487) Boi (0.129)
42	O agente disse para apresentar queixa na	Esquadra (0.645)	Polícia (0.323) Receção (0.032)
43	O Gil quando bebe café costuma fumar um	Cigarro (0.833)	Charuto (0.133) Charro (0.032)
44	A menina dorme sempre agarrada ao seu urso de	Peluche (0.933)	Plástico (0.033) Pelúcia (0.033)
45	Quando o Filipe chegou de viagem foram esperá-lo ao	Aeroporto (0.933)	Comboio (0.033) Metro (0.033)
46	A semana de trabalho será mais curta porque há um	Feriado (0.931)	Concerto (0.034) Teatro (0.034)
47	Na creche os meninos adoram moldar a	Plasticina (0.933)	Massa (0.033) Roupas (0.033)
48	Como estava uma noite fria a Inês foi buscar mais um	Cobertor (0.633)	Casaco (0.333) Gelado (0.033)
49	A Isaura pediu à mãe um bolo com cobertura de	Chocolate (0.903)	Morango (0.065) Baunilha (0.032)
50	Antes de ir dormir o filho deu-lhe um	Beijo (0.867)	Abraço (0.1) Presente (0.033)
51	Os idosos costumavam ir até ao parque jogar às	Cartas (0.903)	Escondidas (0.065) Damas (0.032)
52	Como estava muito cansada decidiu ir cedo para a	Cama (0.774)	Casa (0.161) Escola (0.065)
53	Como os salários não foram pagos os trabalhadores marcaram uma	Greve (0.71)	Reunião (0.161) Manifestação (0.129)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
54	Para chegar ao décimo andar a Mara ia sempre de	Elevador (0.645)	Escadas (0.323) Cavalo (0.032)
55	Durante a noite o menino foi picado por um	Mosquito (0.742)	Bicho (0.129) Insecto (0.129)
56	O Jaime para comprar a casa teve de fazer um	Empréstimo (0.903)	Biscate (0.032) Investimento (0.032)
57	Quando saíram da igreja ouviram o	Sino (0.935)	Padre (0.032) Galo (0.032)
58	O Miguel comprava sempre pipocas quando ia ao	Cinema (0.8)	Supermercado (0.167) Circo (0.033)
59	A Teresa estava cansada e sentou-se num	Banco (0.833)	Sofá (0.133) Cadeirão (0.033)
60	Quando chegou a casa viu que tinha deixado aberta a	Porta (0.586)	Janela (0.379) Gaveta (0.034)
61	O ferido em estado grave foi transportado de	Ambulância (0.828)	Helicóptero (0.103) Urgência (0.069)
62	Para atravessar o rio os escuteiros construíram uma	Ponte (0.6)	Jangada (0.333) Barcaça (0.033) Barragem (0.033)
63	A Inês sonhou que ia ao Brasil de	Avião (0.633)	Barco (0.267) Carro (0.067) Férias (0.033)
64	Todas as noites a Mariana via as	Estrelas (0.6)	Novelas (0.333) Luzes (0.033) Notícias (0.033)
65	O Diogo adora estar à lareira nos dias de	Frio (0.367)	Chuva (0.3) Inverno (0.3) Sol (0.033)
66	Quando foram morar para Lisboa decidiram alugar um	Apartamento (0.567)	Quarto (0.333) Carro (0.067) Casarão (0.033)
67	Nessa manhã estava tanto frio que teve de usar umas	Luvras (0.7)	Meias (0.233) Collants (0.033) Mantas (0.033)
68	A senhora pediu um galão e uma	Torrada (0.567)	Sandes (0.233) Água (0.133) Maçã (0.033)
69	Ao fazer a barba fez um pequeno corte com a	Lâmina (0.742)	Gilete (0.129) Máquina (0.097) Bochecha (0.032)
70	A menina passava horas no quarto a brincar com as suas	Bonecas (0.903)	Barbies (0.032) Mãos (0.032) Roupas (0.032)
71	Quando estava a lavar a loiça a Fernanda partiu um	Prato (0.71)	Copo (0.226) Jarro (0.032) Pulso (0.032)
72	O César acordou sobressaltado quando tocou o	Despertador (0.742)	Alarme (0.129) Sino (0.097) Violino (0.032)
73	Como faltou à aula pediu a uma colega para copiar os	Apontamentos (0.677)	Trabalhos (0.194) Trabalhos de Casa (0.097) Cadernos (0.032)
74	A professora levou os exames na sua	Pasta (0.533)	Mala (0.367) Carteira (0.067) Mão (0.033)
75	Os estudantes costumam ir almoçar à	Cantina (0.9)	Cafetaria (0.033) Terça-feira (0.033) Faculdade (0.033)
76	A Liliana colocou a caneta e o lápis no	Estojo (0.9)	Chão (0.033) Copo (0.033) Cabelo (0.033)
77	O Hugo trouxe da escola um recado da	Professora (0.867)	Directora (0.067) Mãe (0.033) Amiga (0.033)
78	O sonho da mãe do João era que ele entrasse na	Faculdade (0.806)	Universidade (0.129) Academia (0.032) Escola (0.032)
79	O Francisco pendurou na parede um novo	Quadro (0.867)	Poster (0.067) Colar (0.033) Relógio (0.033)
80	Como não gostava de vaca pediu um bife de	Porco (0.516)	Peru (0.487) Frango (0.065) Vitela (0.032)
81	A Mónica foi à piscina inscrever-se em aulas de	Natação (0.833)	Hidroginástica (0.1) Ballet (0.033) Dança (0.033)
82	O João era muito traquina e estava sempre metido em	Sarilhos (0.71)	Confusões (0.161) Problemas (0.097) Trapalhadas (0.032)
83	O Pedro pediu ajuda ao pai para dar o nó na	Gravata (0.806)	Corda (0.129) Camisola (0.032) Sapatilha (0.032)
84	O presidente passou a tarde toda a preparar o	Discurso (0.903)	Chá (0.032) Debate (0.032) Almoço (0.032)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
85	Como não tinha o livro o Hugo foi comprá-lo à	Livraria (0.806)	Loja (0.129) Papelaria (0.032) Biblioteca (0.032)
86	Na viagem a Maria pediu ajuda para carregar a	Mala (0.871)	Bagagem (0.065) Bateria (0.032) Mochila (0.032)
87	Enquanto acabava o arroz salteava os cogumelos na	Frigideira (0.806)	Panela (0.129) Sertã (0.032) Tigela (0.032)
88	Como queria perder peso a Laura começou a fazer	Dieta (0.484)	Exercício (0.452) Ginástica (0.032) Desporto (0.032)
89	A avó usa sempre o seu colar de	Pérolas (0.839)	Ouro (0.065) Diamantes (0.065) Brilhantes (0.032)
90	O Gustavo foi buscar o seu carro à	Oficina (0.5)	Garagem (0.4) Rua (0.067) Porta (0.033)
91	A Joana gostou muito do vestido que viu na	Montra (0.6)	Loja (0.333) Rua (0.033) Zara (0.033)
92	A mãe pediu-lhe para ir comprar ovos ao	Supermercado (0.733)	Mercado (0.167) Continente (0.067) Leiteiro (0.033)
93	A menina antes de ir dormir bebeu um copo de	Leite (0.621)	Água (0.31) Sumo (0.034) Vinho (0.034)
94	Como as calças estavam largas teve de colocar um	Cinto (0.793)	Elástico (0.103) Alfinete (0.069) Botão (0.034)
95	A mãe pediu-lhe ajuda para fatiar o	Bolo (0.586)	Pão (0.207) Fiambre (0.103) Queijo (0.103)
96	A Carlota queria viajar e conhecer novas	Pessoas (0.567)	Cidades (0.2) Culturas (0.167) Coisas (0.033) Terras (0.033)
97	Como estava a chover a Ana calçou umas	Botas (0.6)	Galochas (0.233) Meias (0.1) Luvas (0.033) Sapatilhas (0.033)
98	A Marta quando conduz costuma ouvir	Música (0.8)	Rádio (0.067) Beatles (0.067) Buzinas (0.033) Coldplay (0.033)
99	Para manter a forma decidiu fazer exercício no	Ginásio (0.7)	Parque (0.167) Jardim (0.067) Calçada (0.033) Quintal (0.033)
100	A mãe pediu-lhe para ir buscar pão à	Padaria (0.733)	Mercearia (0.1) Cozinha (0.067) Rua (0.067) Praça (0.033)
101	O professor passou a tarde a corrigir os	Testes (0.833)	Exames (0.067) Trabalhos de Casa (0.067) Erros (0.033)
102	A mãe pediu-lhe para ir buscar a panela à	Cozinha (0.767)	Gaveta (0.1) Prateleira (0.067) Dispensa (0.033) Loja (0.033)
103	O Francisco colocou o livro na	Prateleira (0.484)	Estante (0.419) Biblioteca (0.032) Cabeceira (0.032) Secretária (0.032)
104	No aniversário o marido ofereceu-lhe um valioso	Anel (0.5)	Colar (0.3) Presente (0.1) Diamante (0.065) Carro (0.032)
105	O Tiago comprou um hambúrguer e uma dose de	Batatas (0.862)	Frango (0.034) Ketchup (0.034) Queijo (0.034) Sopa (0.034)
106	O Samuel foi visitar o seu avô ao	Hospital (0.586)	Campo (0.138) Lar (0.138) Cemitério (0.103) Manicómio (0.034)
107	A Filipa estava com dores nas costas por isso foi ao	Médico (0.839)	Massagista (0.065) Fisioterapeuta (0.032) Osteopata (0.032) Quarto (0.032)
108	Ontem o primeiro-ministro foi entrevistado por um	Jornalista (0.677)	Repórter (0.226) Apresentador (0.032) Político (0.032) Psicólogo (0.032)
109	O pai pediu-lhe para pendurar a camisa no	Cabide (0.443)	Armário (0.4) Bengaleiro (0.067) Roupeiro (0.067) Estendal (0.033)
110	O menino gosta tanto do mar que quando crescer quer ser	Marinheiro (0.71)	Pescador (0.161) Mergulhador (0.065) Biólogo (0.032) Surfista (0.032)
111	O menino foi chamado à atenção pelo seu	Comportamento (0.419)	Pai (0.355) Professor (0.161) Desempenho (0.032) Tio (0.032)
112	O pai pediu-lhe para guardar na caixa de ferramentas o	Martelo (0.806)	Alicate (0.097) Berbequim (0.032) Chaveiro (0.032) Dinheiro (0.032)
113	O Gaspar era muito popular e ia sempre a todas as	Festas (0.806)	Aulas (0.097) Meninas (0.032) Raparigas (0.032) Reuniões (0.032)
114	A Vânia ia fazer um bolo mas reparou que não tinha	Farinha (0.613)	Ovos (0.226) Açúcar (0.097) Fruta (0.032) Ingredientes (0.032)
115	O João colocou um piercing no	Umbigo (0.484)	Nariz (0.323) Lábio (0.097) Mamilo (0.065) Furo (0.032)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
116	Como estava atrasado para a consulta teve de chamar um	Táxi (0.871)	Assistente (0.032) Funcionário (0.032) Mecânico (0.032) Médico (0.032)
117	Na viagem à Tunísia andou pela primeira vez num	Camelo (0.419)	Avião (0.355) Barco (0.129) Elefante (0.065) Autocarro (0.032)
118	Para fazer um brinde pediu uma garrafa de	Champanhe (0.774)	Vinho (0.097) Espumante (0.065) Plástico (0.032) Whisky (0.032)
119	No Natal a Sandra serviu o bacalhau no	Forno (0.645)	Prato (0.226) Jantar (0.065) Tabuleiro (0.032) Tacho (0.032)
120	O piloto avisou os passageiros que ia iniciar a	Descolagem (0.443)	Viagem (0.267) Aterragem (0.233) Descida (0.033) Manobra (0.033)
121	O pai pediu para ir buscar uma cerveja fresca ao	Frigorífico (0.767)	Café (0.133) Armário (0.033) Bar (0.033) Congelador (0.033)
122	A Inês pediu à mãe para pintar as	Unhas (0.767)	Paredes (0.133) Folhas (0.033) Peças (0.033) Portas (0.033)
123	A Beatriz decidiu ir ver a exposição da famosa	Pintora (0.552)	Artista (0.276) Escultora (0.069) Atriz (0.069) Amália (0.034)
124	Os sapatos que a Mara encontrou estavam guardados numa	Caixa (0.724)	Gaveta (0.172) Mochila (0.034) Prateleira (0.034) Sapateira (0.034)
125	A Bianca comprou um novo vestido para levar ao	Baile (0.517)	Casamento (0.276) Batizado (0.138) Cinema (0.034) Jantar (0.034)
126	O Júlio estava no parque a dar comida aos	Pombos (0.69)	Pássaros (0.138) Patos (0.069) Pobres (0.069) Animais (0.034)
127	Para fazer a bainha a Daniela pediu ajuda à	Mãe (0.483)	Avó (0.345) Costureira (0.103) Tia (0.034) Vizinha (0.034)
128	O Rui precisava de trocar a pilha do	Comando (0.655)	Relógio (0.172) Carro (0.069) Rádio (0.069) Gravador (0.034)
129	Como a Ana é vegetariana recusou-se a comer o bife de	Vaca (0.533)	Peru (0.167) Porco (0.133) Atum (0.067) Frango (0.067) Javali (0.033)
130	No Verão a Cristina decidiu pintar a	Casa (0.7)	Parede (0.167) Carrinha (0.033) Cerca (0.033) Janela (0.033) Tela (0.033)
131	Depois de pintar o quadro teve de comprar novas	Tintas (0.767)	Telas (0.1) Aquarelas (0.033) Cortinas (0.033) Móveis (0.033) Roupas (0.033)
132	Junto ao mar voava um conjunto de	Gaivotas (0.6)	Pássaros (0.167) Andorinhas (0.1) Aves (0.067) Papéis (0.033) Patos (0.033)
133	Naquela praia decorria um pequeno torneio de	Voleibol (0.633)	Futebol (0.167) Ténis (0.1) Basquetebol (0.033) Karaté (0.033) Xadrez (0.033)
134	O tiramisu era a especialidade daquele famoso	Cozinheiro (0.323)	Chefe (0.258) Restaurante (0.226) Pasteleiro (0.129) Actor (0.032) Jantar (0.032)
135	O Rodrigo tem um sono leve e acorda com qualquer	Barulho (0.6)	Ruído (0.2) Som (0.067) Coisa (0.067) Pancada (0.033) Assobio (0.033)
136	A Liliana teve uma grande discussão com o seu	Pai (0.467)	Namorado (0.233) Irmão (0.1) Marido (0.1) Filho (0.067) Amigo (0.033)
137	O Pedro comprou um cavalo para puxar a	Carroça (0.828)	Burra (0.034) Carruagem (0.034) Casa (0.034) Irmã (0.034) Palha (0.034)
138	A menina estava entusiasmada porque era o primeiro dia de	Aulas (0.484)	Escola (0.487) Ballet (0.032) Férias (0.032) Trabalho (0.032) Sol (0.032)
139	O Filipe foi cedo para casa porque não queria perder aquele	Episódio (0.267)	Jogo (0.2) Autocarro (0.167) Comboio (0.133) Programa (0.133) Filme (0.1)
140	Quando esteve em Itália fartou-se de comer	Massa (0.452)	Pizza (0.487) Bolos (0.065) Esparguete (0.032) Lasanha (0.032) Carne (0.032)
141	A Marisa queria sobrevoar Lisboa num	Avião (0.484)	Helicóptero (0.226) Balão (0.161) Jacto (0.065) Paraquedas (0.032) Tapete (0.032)
142	Quando o jovem chegou ao bar pediu uma	Cerveja (0.484)	Bebida (0.226) Água (0.129) Sandes (0.065) Tosta (0.065) Coca-cola (0.032)
143	O sinal indicava que tinham chegado ao topo da	Montanha (0.774)	Colina (0.065) Rua (0.065) Carreira (0.032) Fila (0.032) Serra (0.032)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
144	A mãe disse-lhe para guardar o livro na	Estante (0.419)	Mochila (0.258) Prateleira (0.161) Gaveta (0.065) Mala (0.065) Reprografia (0.032)
145	A melhor forma de circular naquela cidade é usando o	Metro (0.487)	Carro (0.323) GPS (0.129) Autocarro (0.097) Mapa (0.032) Triciclo (0.032)
146	A menina queria vestir a sua nova	Saia (0.452)	Camisola (0.226) Camisa (0.129) Roupa (0.097) Blusa (0.065) Nova (0.032)
147	Para cobrir as costas a avó usava sempre um	Xaile (0.645)	Cobertor (0.129) Cachecol (0.065) Casaco (0.065) Lenço (0.065) Edredom (0.032)
148	Durante as férias de família em Itália decidiram alugar uma	Casa (0.677)	Caravana (0.161) Carrinha (0.065) Cabana (0.032) Mota (0.032) Vespa (0.032)
149	O aluno tirava notas usando os coloridos	Lápis (0.552)	Marcadores (0.276) Apontamentos (0.069) Cadernos (0.034) Diapositivos (0.034) Pincéis (0.034)
150	O Paulo queria aprender novas músicas para tocar na sua	Guitarra (0.69)	Viola (0.103) Banda (0.103) Bateria (0.034) Festa (0.034) Flauta (0.034)
151	Depois da licenciatura o Hugo decidiu fazer um	Mestrado (0.7)	Doutoramento (0.1) InterRail (0.1) Curso (0.033) Cruzeiro (0.033) Projeto (0.033)
152	O Gonçalo foi até ao parque na sua	Bicicleta (0.467)	Mota (0.3) Rua (0.133) Aldeia (0.033) Casa (0.033) Cidade (0.033)
153	No Natal a avó deu-lhe uma caixa de	Chocolates (0.5)	Bombons (0.25) Rebuçados (0.143) Cartão (0.036) Música (0.036) Prendas (0.036)
154	O Manuel foi à oficina buscar o	Carro (0.759)	Martelo (0.103) Cabo (0.034) Rádio (0.034) Relógio (0.034) Trator (0.034)
155	O bebé deixou cair o seu	Brinquedo (0.621)	Biberão (0.138) Babete (0.138) Boneco (0.034) Livro (0.034) Peluche (0.034)
156	Como gosta de cuidar de pessoas a Sónia quer ser	Enfermeira (0.443)	Médica (0.233) Educadora (0.133) Babysitter (0.067) Mãe (0.067) Psicóloga (0.033) Voluntária (0.033)
157	O Guilherme fica enjoado sempre que anda de	Barco (0.467)	Carro (0.267) Autocarro (0.1) Avião (0.067) Bicicleta (0.033) Comboio (0.033) Mota (0.033)
158	Como estava doente a Fernanda não pôde ir à	Escola (0.467)	Festa (0.233) Praia (0.167) Competição (0.033) Conferência (0.033) Discoteca (0.033) Faculdade (0.033)
159	Para ajudar a fazer a trança a avó foi buscar um	Elástico (0.467)	Pente (0.367) Espelho (0.033) Gancho (0.033) Instrumento (0.033) Secador (0.033) Totó (0.033)
160	Como não se sentia bem a Andreia ligou ao seu	Pai (0.6)	Médico (0.133) Namorado (0.133) Amigo (0.033) Avô (0.033) Marido (0.033) Psicólogo (0.033)
161	A professora pediu-lhe para reescrever a	Composição (0.443)	Frase (0.267) Resposta (0.1) Carta (0.067) Redação (0.067) História (0.033) Peça (0.033)
162	Depois de marcar a viagem ainda tinham de reservar o	Hotel (0.533)	Lugar (0.133) Avião (0.1) Bilhete (0.1) Voo (0.067) Quarto (0.033) Táxi (0.033)
163	A Lara nem acredita que recebeu um anel de	Noivado (0.419)	Ouro (0.39) Diamantes (0.161) Casamento (0.032) Prata (0.032) Rubi (0.032) Amizade (0.032)
164	O Gil dizia que se ganhasse o euromilhões compraria uma	Casa (0.581)	Mota (0.194) Mansão (0.097) Bola (0.032) Carrinha (0.032) Discoteca (0.032) Iate (0.032)

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165	A mãe pediu-lhe para colocar a roupa molhada no	Estendal (0.443)	Cesto (0.233) Secador (0.133) Saco (0.1) Alguidar (0.033) Armário (0.033) Balde (0.033)
166	Como estava muito calor apetecia-lhe tomar um	Banho (0.448)	Duche (0.138) Refresco (0.138) Sum (0.103) Chá (0.069) Refrigerante (0.069) Batido (0.034)
167	O Carlos ia a correr e tropeçou nos	Atacadores (0.414)	Degraus (0.31) Pés (0.103) Sapatos (0.069) Cordões (0.034) Brinquedos (0.034) Tapetes (0.034)
168	O jovem contava entusiasmado que abriu uma nova	Loja (0.333)	Empresa (0.2) Conta (0.133) Discoteca (0.133) Prenda (0.1) Escola (0.067) Embalagem (0.033)
169	Para acompanhar a feijoada o Ivo pediu um prato de	Arroz (0.552)	Batatas (0.138) Salada (0.138) Sopa (0.069) Alface (0.034) Carne (0.034) Pão (0.034)
170	Para dar banho ao bebé usavam uma	Esponja (0.4)	Banheira (0.2) Bacia (0.133) Toalha (0.133) Luva (0.067) Tina (0.033) Touca (0.033)
171	A Helena conseguiu passar no exame de	Código (0.3)	Condução (0.233) Português (0.2) Matemática (0.133) História (0.067) Filosofia (0.033) Neuropsicologia (0.033)
172	O cirurgião tentou tudo para salvar o	Paciente (0.71)	Homem (0.129) Bebé (0.032) Dia (0.032) Doente (0.032) Órgão (0.032)
173	Quando chegou ao aeroporto reparou que se tinha esquecido do	Passaporte (0.6)	Telemóvel (0.167) Casaco (0.067) Chapéu (0.067) BI (0.033) Cartão (0.033) Pente (0.033)
174	A avó foi buscar frutas frescas ao	Mercado (0.419)	Pomar (0.161) Quintal (0.161) Supermercado (0.161) Campo (0.032) Frigorífico (0.032) Mato (0.032)
175	O Jaime pediu um sumo e uma sandes de	Queijo (0.4)	Fiambre (0.267) Presunto (0.133) Atum (0.067) Frango (0.067) Ovo (0.033) Banana (0.033)
176	A mãe pediu-lhe para arrumar os seus	Sapatos (0.452)	Livros (0.39) Ténis (0.097) Medicamentos (0.065) Brincos (0.032) Brinquedos (0.032) Cadernos (0.032)
177	A mãe pediu-lhe ajuda para fatiar a	Tarte (0.4)	Carne (0.367) Bola (0.067) Pizza (0.067) Carcaça (0.033) Maçã (0.033) Quiche (0.033)
178	Quando arrumava o quarto a Ana decidiu mudar os	Lençóis (0.333)	Cortinados (0.167) Livros (0.167) Móveis (0.167) Quadros (0.1) Cadernos (0.033) Cobertores (0.033)
179	O César arrumou os livros do ano anterior no	Armário (0.567)	Sótão (0.233) Cacifo (0.067) Armazém (0.033) Escritório (0.033) Móvel (0.033) Quarto (0.033)
180	A igreja estava toda preparada para o	Casamento (0.69)	Natal (0.103) Ensaio (0.069) Arraial (0.034) Batizado (0.034) Padre (0.036) Piquenique (0.034)
181	Para não sujar a banca cortou os legumes numa	Tábua (0.7)	Tigela (0.067) Travessa (0.067) Bandeja (0.033) Coisa (0.033) Frigideira (0.033) Mesa (0.033) Placa (0.033)
182	Quando chegou ao quarto a Cristina acendeu o	Candeeiro (0.567)	Aquecedor (0.1) Cigarro (0.1) Fósforo (0.067) Isqueiro (0.067) Ar Condicionado (0.033) Computador (0.033) Forno (0.033)
183	O avô costumava beber café com leite naquela	Caneca (0.516)	Chávina (0.129) Manhã (0.097) Mesa (0.097) Taça (0.065) Pastelaria (0.032) Tasca (0.032) Tigela (0.032)
184	O André comprou uma máquina nova para o curso de	Fotografia (0.5)	Matemática (0.233) Psicologia (0.1) Engenharia (0.033) Escrita (0.033) Gestão (0.033) Informática (0.033) Tecnologias (0.033)

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185	As crianças estavam a brincar à apanhada no	Recreio (0.533)	Parque (0.133) Pátio (0.1) Jardim (0.067) Quintal (0.067) Exterior (0.033) Intervalo (0.033) Quarto (0.033)
186	A criança estava a fazer os trabalhos de casa na	Sala (0.487)	Escola (0.194) Cozinha (0.161) Biblioteca (0.065) Secretária (0.065) Rua (0.065) Garagem (0.032) Varanda (0.032)
187	Antes de ir à caça o Umberto limpou as	Armas (0.355)	Botas (0.39) Espingardas (0.129) Mãos (0.097) Caçadeiras (0.032) Facas (0.032) Meias (0.032) Pistolas (0.032)
188	A vizinha da Carla tinha muitos	Gatos (0.419)	Cães (0.39) Amigos (0.129) Filhos (0.065) Ciúme (0.032) Defeitos (0.032) Sinais (0.032) ()
189	Os pais decidiram inscrever os filhos num	Colégio (0.419)	Clube (0.129) Desporto (0.129) Ginásio (0.097) Infantário (0.097) Curso (0.065) Seminário (0.032) ATL (0.032)
190	O José esperou horas na fila para conseguir comprar os	Bilhetes (0.613)	Ténis (0.129) Sapatos (0.097) Autocolantes (0.032) Cães (0.032) CDs (0.032) Doces (0.032) Jogos (0.032)
191	A menina via as crianças da sua	Escola (0.323)	Rua (0.323) Idade (0.097) Janela (0.097) Turma (0.065) Aldeia (0.032) Praceta (0.032) Tia (0.032)
192	Para andar o avô precisava da ajuda da	Bengala (0.516)	Muleta (0.194) Filha (0.097) Neta (0.065) Avó (0.032) Mãe (0.032) Mão (0.032) Irmã (0.032)
193	O Gustavo não passava um dia sem tomar um	Comprimido (0.517)	Café (0.241) Copo (0.069) Banho (0.034) Calmante (0.034) Chá (0.034) Refresco (0.034) Sumo (0.034)
194	O Miguel disse aos amigos que não podiam perder aquele	Filme (0.233)	Jogo (0.2) Comboio (0.167) Autocarro (0.133) Concerto (0.067) Episódio (0.067) Espetáculo (0.067) Evento (0.033) Iô-Iô (0.033)
195	Os pais decidiram que naquele passeio iriam visitar um	Museu (0.533)	Amigo (0.133) Castelo (0.067) Jardim (0.067) Monge (0.067) Avó (0.033) Convento (0.033) Palácio (0.033) Templo (0.033)
196	A Maria adorava ouvir o canto daquele	Pássaro (0.645)	Pardal (0.065) Rapaz (0.065) Rouxinol (0.065) Galro (0.032) Menino (0.032) Cantor (0.032) Senhor (0.032) Violino (0.032)
197	Aos sábados a mãe costuma ir às compras ao	Supermercado (0.516)	Mercado (0.129) Continente (0.129) Minimercado (0.065) Shopping (0.032) Chiado (0.032) Minipreço (0.032) Modelo (0.032) Colombo (0.032)
198	Naquela noite os jovens decidiram ir a um	Bar (0.633)	Café (0.067) Jantar (0.067) Jogo (0.067) Cinema (0.033) Concerto (0.033) Festival (0.033) Jardim (0.033) Parque (0.033)
199	Como o tempo esteve bom o agricultor espera bons	Resultados (0.5)	Frutos (0.167) Legumes (0.067) Tomates (0.067) Cultivos (0.067) Abacates (0.033) Milhos (0.033) Produtos (0.033) Pepinos (0.033)
200	O Simão vai todos os dias para a escola de	Autocarro (0.367)	Carro (0.233) Bicicleta (0.133) Metro (0.1) Condução (0.033) Inglês (0.033) Mota (0.033) Música (0.033) Trotinete (0.033)
201	O menino pediu à mãe batatas fritas e um	Hambúrguer (0.3)	Sumo (0.3) Bife (0.167) Gelado (0.067) Batido (0.033) Cachorro (0.033) Pão (0.033) Refrigerante (0.033) Chupa (0.033)
202	Os alunos estiveram a jogar à bola no	Recreio (0.258)	Pátio (0.258) Campo (0.194) Parque (0.129) Estádio (0.032) Jardim (0.032) Pavilhão (0.032) Quintal (0.032) Relvado (0.032)
203	O Xavier gosta de matemática e quando crescer quer ser	Professor (0.355)	Matemático (0.258) Engenheiro (0.194) Contabilista (0.032) Desempregado (0.032) Economista (0.032) Gestor (0.032) Grande (0.032) Investigador (0.032)

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204	A avó pediu-lhe para aquecer água usando a	Chaleira (0.484)	Cafeteira (0.161) Panela (0.129) Chama (0.065) Banheira (0.032) Caldeira (0.032) Caneca (0.032) Chávena (0.032) Torneira (0.032)
205	Quando chegou a casa reparou que se tinha esquecido da	Carteira (0.323)	Mala (0.194) Chave (0.161) Mochila (0.161) Folha (0.032) Gabardine (0.032) Guitarra (0.032) Mota (0.032) Mãe (0.032)
206	O Rafael tropeçou ao subir a	Escada (0.613)	Rua (0.129) Escadaria (0.065) Árvore (0.032) Bicicleta (0.032) Cama (0.032) Estante (0.032) Mota (0.032) Varanda (0.032)
207	Para fazer o exercício a Cíntia pediu ao colega a	Caneta (0.581)	Calculadora (0.161) Bola (0.065) Ajuda (0.032) Aula (0.032) Barra (0.032) Borracha (0.032) Máquina (0.032) Permissão (0.032)
208	A avó tinha o hábito de beber	Chá (0.487)	Vinho (0.39) Água (0.097) Whisky (0.065) Aguardente (0.032) Bastante (0.032) Café (0.032) Cerveja (0.032) Gin (0.032)
209	Ao entregar a carta reparou que se tinha esquecido do	Selo (0.517)	telemóvel (0.172) Nome (0.103) Casaco (0.034) Correio (0.034) Endereço (0.034) Maço de tabaco (0.034) Remetente (0.034) Talão (0.034)
210	Como trabalho de casa a professora pediu para acabarem o	Exercício (0.533)	Texto (0.2) Trabalho (0.067) Manual (0.033) Problema (0.033) Questionário (0.033) Relatório (0.033) Teste (0.033) TPC (0.033)
211	O Igor quando cozinha suja sempre o	Fogão (0.586)	Avental (0.103) Balcão (0.069) Chão (0.069) Armário (0.034) Forno (0.034) Pólo (0.034) Tapete (0.034) Prato (0.034)
212	A mãe disse-lhe para parar de comer as	Gomas (0.379)	Batatas (0.172) Bolachas (0.172) Uvas (0.103) Cenouras (0.034) Favas (0.034) Nozes (0.034) Panquecas (0.034) Rabanadas (0.034)
213	A avó está a tricotar para a neta um	Cachecol (0.379)	Casaco (0.345) Gorro (0.069) Capuz (0.034) Chapéu (0.034) Blusão (0.034) Lenço (0.034) Vestido (0.034) Xaile (0.034)
214	A receita de arroz de pato da Márcia leva no topo	Chouriço (0.5)	Queijo (0.143) Azeitonas (0.071) Laranja (0.071) Ovo (0.071) Bacon (0.036) Cereja (0.036) Milho (0.036) Molho (0.036)
215	O Jaime estava ansioso para que chegassem as	Férias (0.593)	Primas (0.111) Aulas (0.074) Encomendas (0.037) Filhas (0.037) Irmãs (0.037) Meninas (0.037) Pessoas (0.037) Prendas (0.037)
216	O Vítor trocou as férias de praia por uns dias no	Campo (0.677)	Alentejo (0.067) Alasca (0.033) Algarve (0.033) Chiado (0.033) Deserto (0.033) Interior (0.033) Seixal (0.033) Trabalho (0.033) Voluntariado (0.033)
217	A Joana adora ver tudo florido na	Primavera (0.448)	Varanda (0.172) Rua (0.103) Janela (0.069) Cama (0.034) Casa (0.034) Horta (0.034) Lapela (0.034) Sala (0.034) Televisão (0.034)
218	Os escuteiros atravessavam uma zona de	Perigo (0.567)	Guerra (0.1) Lama (0.1) Árvores (0.033) Estacionamento (0.033) Floresta (0.033) Montanhas (0.033) Passagem (0.033) Pescadores (0.033) Silvas (0.033)
219	Antes da consulta o médico pediu-lhe para fazer	Exames (0.5)	Análises (0.2) Jejum (0.067) Algo (0.033) Alongamentos (0.033) Flexões (0.033) Ginástica (0.033) Marcação (0.033) Respiração (0.033) Xixi (0.033)
220	O grupo de escuteiros decidiu fazer um	Acampamento (0.533)	Almoço (0.067) Jantar (0.067) Lanche (0.067) Peddy-Paper (0.067) Piquenique (0.067) Jogo (0.033) Mapa (0.033) Passeio (0.033) Ritual (0.033)
221	O Luís sonhava um dia ir até à lua de	Foguetão (0.516)	Avião (0.161) Carro (0.065) Mel (0.065) Bicicleta (0.032) Cavalo (0.032) Cometa (0.032) Nave espacial (0.032) Skate (0.032) Mota (0.032)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
222	O menino ainda não conseguia ler as	Palavras (0.452)	Frases (0.258) Revistas (0.065) Bandas desenhadas (0.032) Cartas (0.032) Consoantes (0.032) Histórias (0.032) Letras (0.032) Pautas (0.032) Sebentas (0.032)
223	Só naquela tarde o doutor Mário já deu quinze	Consultas (0.71)	Atestados (0.032) Baixas (0.032) Bananas (0.032) Faltas (0.032) Injeções (0.032) Operações (0.032) Pacientes (0.032) Sessões (0.032) Vacinas (0.032)
224	A aranha ficou presa na sua	Teia (0.6)	Perna (0.1) Mão (0.067) Saia (0.033) Roupa (0.033) Janela (0.033) Camisola (0.033) Cama (0.033) Cabeça (0.033) Armadilha (0.033)
225	Quando chegou a casa viu que havia um graffiti no	Quarto (0.172)	Muro (0.138) Portão (0.138) Teto (0.138) Carro (0.103) Chão (0.103) Alpendre (0.069) Prédio (0.069) Candeeiro (0.034) Pátio (0.034)
226	A Rute disse que nunca encontra nada na sua	Mala (0.5)	Casa (0.133) Gaveta (0.1) Cama (0.033) Carteira (0.033) Cave (0.033) Cidade (0.033) Mochila (0.033) Pasta (0.033) Sala (0.033) Secretária (0.033)
227	Depois do almoço, o António pediu um café e um	Bolo (0.517)	Bagaço (0.069) Croissant (0.069) Pastel (0.069) Pastel de Nata (0.069) Chocolate (0.034) Moscatel (0.034) Pudim (0.034) Queque (0.034) Rebuçado (0.034) Salame (0.034)
228	O Simão comia sempre os cereais na mesma	Tigela (0.323)	Taça (0.39) Mesa (0.129) Altura (0.032) Cadeira (0.032) Casa (0.032) Colher (0.032) Forma (0.032) Hora (0.032) Maneira (0.032) Caneta (0.032)
229	Enquanto preparava a comida a Sónia queimou a	Mão (0.6)	Panela (0.067) Cozinha (0.067) Cara (0.033) Blusa (0.033) Lasanha (0.033) Manga (0.033) Massa (0.033) Pele (0.033) Sopa (0.033) Tarte (0.033)
230	O Filipe acordou sobressaltado quando ouviu os	Gritos (0.323)	Barulhos (0.161) Tiros (0.161) Trovões (0.097) Pais (0.065) Assaltantes (0.032) Cães (0.032) Pássaros (0.032) Ruídos (0.032) Sinos (0.032) Vizinhos (0.032)
231	Quando a mãe vai trabalhar o bebé fica no	Infantário (0.452)	Berço (0.129) Berçário (0.097) Avô (0.065) Jardim-de-infância (0.065) Colégio (0.032) Externato (0.032) Hospício (0.032) Quarto (0.032) ATL (0.032) Carro (0.032)
232	A Ana não conseguia adormecer porque estava com uma	Insónia (0.39)	Dor (0.194) Enxaqueca (0.097) Gripe (0.097) Amiga (0.065) Constipação (0.065) Depressão (0.065) Bebedeira (0.032) Diarreia (0.032) Moca (0.032) Virose (0.032)
233	A Lúcia guardou a nota que recebeu na	Escola (0.323)	Carteira (0.258) Loja (0.097) Faculdade (0.065) Páscoa (0.065) Festa (0.032) Lotaria (0.032) Quinta-feira (0.032) Rua (0.032) Segunda-feira (0.032) Véspera (0.032)
234	As chuvas estragaram as colheitas disse o	Agricultor (0.548)	Avô (0.097) João (0.065) Joaquim (0.065) Jornalista (0.032) Filipe (0.032) José (0.032) Pedro (0.032) Ramiro (0.032) Zé (0.032) Reitor (0.032)
235	Antes de ir de férias a Sara foi comprar um novo	Biquíni (0.39)	Carro (0.194) Livro (0.161) Telemóvel (0.129) Blusão (0.032) Cão (0.032) Espelho (0.032) Fato de banho (0.032) Protetor solar (0.032) Saco (0.032) Tablet (0.032)
236	Todos os sábados o Alberto tem treinos de	Futebol (0.452)	Futsal (0.129) Voleibol (0.097) Basquetebol (0.065) Natação (0.065) Atletismo (0.032) Exercício físico (0.032) Golfe (0.032) Hóquei (0.032) Karaté (0.032) Ténis (0.032)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
237	A Laura pediu para ninguém mexer no seu	Telemóvel (0.4)	Computador (0.167) Cabelo (0.133) Quarto (0.067) Bolo (0.033) Brinquedo (0.033) Caderno (0.033) Dinheiro (0.033) Dossier (0.033) Livro (0.033) Telefone (0.033)
238	Para além das cervejas pediram um prato de	Tremoços (0.345)	Caracóis (0.241) Amendoins (0.103) Uvas (0.069) Massa (0.034) Hambúrgueres (0.034) Gambas (0.034) Doces (0.034) Carne (0.034) Camarão (0.034) Arroz (0.034)
239	O Armando levou a mesa com a perna partida para o	Lixo (0.379)	Sótão (0.138) Carpinteiro (0.103) Quintal (0.103) Jardim (0.069) Arranjo (0.034) Avô (0.034) Exterior (0.034) Gabinete (0.034) Hospital (0.034) Quarto (0.034)
240	O pai do Rui queria aprender a jogar	Futebol (0.333)	Bilhar (0.167) Badmínton (0.067) Computador (0.067) Consola (0.067) Ténis (0.067) Xadrez (0.067) Playstation (0.067) Basquetebol (0.033) Brigde (0.033) FIFA 15 (0.033)
241	O professor corrigiu os exames no	Escritório (0.267)	Quarto (0.2) Sábado (0.167) Domingo (0.065) Gabinete (0.065) Carro (0.032) Colégio (0.032) Computador (0.032) Fim-de-semana (0.032) Quadro (0.032) Sofá (0.032)
242	O médico receitou-lhe novos medicamentos para controlar o	Stress (0.467)	Sono (0.1) Apetite (0.067) Nervosismo (0.067) Peso (0.067) Alzheimer (0.033) Animal (0.033) Coração (0.033) Filho (0.033) Humor (0.033) Reumatismo (0.033) Tremor (0.033)
243	O Fernando não comeu os amendoins porque tinha	Alergia (0.484)	Sede (0.129) Dores (0.065) Fome (0.065) Azia (0.032) Diarreia (0.032) Enjoos (0.032) Febra (0.032) Amêndoas (0.032) Gases (0.032) Lanchado (0.032) Nojo (0.032)
244	O Adelino decidiu oferecer um livro à	Mãe (0.323)	Namorada (0.258) Maria (0.129) Amiga (0.032) Ana (0.032) Inês (0.032) Irmã (0.032) Joana (0.032) Mulher (0.032) Paula (0.032) Prima (0.032) Professora (0.032)
245	O avô pediu-lhe para ir buscar a enxada ao	Jardim (0.267)	Quintal (0.233) Armário (0.133) Barracão (0.067) Sótão (0.067) Armazém (0.033) Campo (0.033) Carro (0.033) Curral (0.033) Escritório (0.033) Quarto (0.033) Reboque (0.033)
246	O Igor acordou a meio da noite com um	Pesadelo (0.443)	Barulho (0.133) Susto (0.1) Sonho (0.067) Cão (0.033) Estrondo (0.033) Grito (0.033) Hematoma (0.033) Pensamento (0.033) Som (0.033) Telefonema (0.033) Tremor (0.033)
247	Os meninos ficaram toda a tarde a decorar o	quarto (0.233)	jardim (0.167) texto (0.167) bolo (0.1) alfabeto (0.067) barco (0.033) boneco (0.033) livro (0.033) pinheiro (0.033) poema (0.033) sótão (0.033) sumário (0.033) trabalho (0.033)
248	A Susana gosta do som angelical que vem da	Harpa (0.31)	Igreja (0.207) Rádio (0.103) Missa (0.069) Aparelhagem (0.034) Boca (0.034) Casa de banho (0.034) Cozinha (0.034) Lira (0.034) Natureza (0.034) Ópera (0.034) Orquestra (0.034) Televisão (0.034)
249	A educadora organizava muitas actividades para estimular a	Criatividade (0.194)	Atenção (0.161) Aprendizagem (0.161) Memória (0.129) Concentração (0.065) Inteligência (0.065) Cabeça (0.032) Criança (0.032) Educação (0.032) Empatia (0.032) Fala (0.032) Imaginação (0.032) Turma (0.032)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
250	A menina queria ser como a mãe e usar	Maquilhagem (0.194)	Salto (0.161) Avental (0.097) Brincos (0.097) Sapatos (0.097) Batom (0.065) Chapéus (0.065) Mala (0.065) Calças (0.032) Livros (0.032) Óculos (0.032) Saia (0.032) Soutien (0.032)
251	Enquanto jantavam a mãe pediu-lhe para passar o	Sal (0.2)	Arroz (0.133) Pão (0.133) Prato (0.133) Comando (0.067) Frango (0.067) Tabuleiro (0.067) Bife (0.033) Jarro (0.033) Pato (0.033) Sumo (0.033) Tabaco (0.033) Tacho (0.033)
252	A estrada tinha sido cortada porque ia passar um	Camião (0.367)	Comboio (0.167) Cortejo (0.1) Tractor (0.067) Animal (0.033) Autocarro (0.033) Cão (0.033) Desfile (0.033) Famoso (0.033) Festival (0.033) Limpa-neves (0.033) Passeio de motas (0.033) Terramoto (0.033)
253	Depois da escola o menino ia para o	Parque (0.276)	Ginásio (0.103) ATL (0.103) Futebol (0.069) Infantário (0.069) Jardim (0.069) Treino (0.069) Campo (0.069) Banco (0.034) Autocarro (0.034) Hospital (0.034) Quarto (0.034) Recreio (0.034)
254	A Sara decidiu oferecer ao namorado um novo	Perfume (0.167)	Carro (0.133) Casaco (0.133) Telemóvel (0.133) Relógio (0.1) Jogo (0.067) Cachecol (0.033) Caderno (0.033) Capacete (0.033) Livro (0.033) Pólo (0.033) Porta-chaves (0.033) Portátil (0.033) Visual (0.033)
255	O aviso alertava para perigo de derrocada da	Falésia (0.143)	Encosta (0.143) Montanha (0.107142857142857) Arriba (0.071) Parede (0.071) Ponte (0.071) Rocha (0.071) Serra (0.071) Casa (0.071) Costa (0.036) Estrada (0.036) Praia (0.036) Torre (0.036) Vertente (0.036)
256	Quando chegou ao trabalho reparou que se tinha esquecido do	Telemóvel (0.3)	Casaco (0.133) Computador (0.1) Dossier (0.1) Livro (0.067) Almoço (0.033) Caderno (0.033) Cartão do cidadão (0.033) Chapéu (0.033) Documento (0.033) Estojo (0.033) Ficheiro (0.033) Papel (0.033) Trabalho (0.033)
257	O Fernando teve de acelerar para ultrapassar o	Carro (0.39)	Camião (0.226) Autocarro (0.097) Vermelho (0.065) Adversário (0.032) Ciclista (0.032) Condutor (0.032) Táxi (0.032) Trânsito (0.032) Alberto (0.032) Jorge (0.032) Manuel (0.032) Martim (0.032) Toyota (0.032)
258	O Ivo guardou a moeda que recebeu no	Bolso (0.267)	Natal (0.233) Aniversário (0.133) Anos (0.033) Bingo (0.033) Café (0.033) Concurso (0.033) Jogo (0.033) Mercado (0.033) Parque (0.033) Porta-moedas (0.033) Salão (0.033) Totobola (0.033) Verão (0.033)
259	No pavilhão municipal decorria uma competição de	Atletismo (0.133)	Basquetebol (0.133) Futebol (0.133) Natação (0.1) Voleibol (0.1) Ginástica (0.067) Ténis (0.067) Andebol (0.033) Cavalos (0.033) Dança (0.033) Desporto (0.033) Futsal (0.033) Hóquei (0.033) Karaté (0.033) Leitura (0.033)
260	Nas férias a Maria queria ir à	Praia (0.484)	Suíça (0.097) Escola (0.032) Festa (0.032) Piscina (0.032) Alemanha (0.032) China (0.032) Finlândia (0.032) Índia (0.032) Inglaterra (0.032) Irlanda (0.032) Itália (0.032) Paris (0.032) Síria (0.032) Livraria (0.032)
261	O José foi cortar lenha para o seu	Quintal (0.233)	Fogão (0.1) Forno (0.1) Pai (0.1) Amigo (0.067) Magusto (0.067) Tio (0.067) Fogareiro (0.033) Fogo (0.033) Grelhador (0.033) Inverno (0.033) Jardim (0.033) Jipe (0.033) Móvel (0.033) Vizinho (0.033)
262	A avó mantinha nas traseiras da casa uma pequena	Horta (0.367)	Casota (0.1) Bicicleta (0.067) Planta (0.067) Arrecadação (0.033) Barraquinha (0.033) Cadeira (0.033) Cadela (0.033) Caixa (0.033) Flor

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
			(0.033) Fonte (0.033) Gata (0.033) Lareira (0.033) Magnólia (0.033) Manta (0.033) Máquina (0.033)
263	A produção está aquém do esperado explicou o	Produtor (0.194)	Director (0.161) Comentador (0.129) Professor (0.097) Senhor (0.065) Alberto (0.032) Artista (0.032) Ator (0.032) Chefe (0.032) Crítico (0.032) Economista (0.032) Jornalista (0.032) Pai (0.032) Presidente (0.032) Responsável (0.032) Ministro (0.032)
264	A Helena juntou todas as informações num único	Documento (0.233)	Papel (0.2) Caderno (0.133) Bloco (0.033) Conjunto (0.033) Dispositivo (0.033) Dossier (0.033) Folheto (0.033) Grupo (0.033) Registo (0.033) Resumo (0.033) Saco (0.033) Sítio (0.033) Slide (0.033) Trabalho (0.033) Arquivo (0.033)
265	A Gisela herdou da mãe um conjunto de	Brincos (0.226)	Jóias (0.129) Anéis (0.065) Loíça (0.065) Porcelana (0.065) Talheres (0.065) Colares (0.065) Coisas (0.032) Características (0.032) Cozinha (0.032) Livros (0.032) Pratos (0.032) Pulseiras (0.032) Relógios (0.032) Sapatos (0.032) Terrenos (0.032) Terras (0.032)
266	Depois da reforma o avô dedicou-se a trabalhos de	Casa (0.167)	Carpintaria (0.133) Jardinagem (0.133) Agricultura (0.067) Costura (0.067) Descanso (0.033) Escrita (0.033) Madeiras (0.033) Manuais (0.033) Manufaturas (0.033) Mão (0.033) Mecânica (0.033) Oficina (0.033) Olaria (0.033) Pesca (0.033) Pesquisa (0.033) Restauro (0.033)
267	Na cerimónia o presidente condecorou alguns	Soldados (0.226)	Militares (0.129) Alunos (0.097) Cidadãos (0.065) Funcionários (0.065) Aldeões (0.032) Cíveis (0.032) Companheiros (0.032) Deputados (0.032) Detalhes (0.032) Idiotas (0.032) Marinheiros (0.032) Ministros (0.032) Participantes (0.032) Polícias (0.032) Tópicos (0.032) Trabalhadores (0.032) Veteranos (0.032) Visitantes (0.032)
268	A Adélia estava com dúvidas se devia fazer a	Cama (0.129)	Prova (0.097) Apresentação (0.065) Operação (0.065) Pergunta (0.065) Tarefa (0.065) Viagem (0.065) Cirurgia (0.065) Bainha (0.032) Cadeira (0.032) Carne (0.032) Análise (0.032) Comida (0.032) Conta (0.032) Depilação (0.032) Ficha (0.032) Lista (0.032) Melhoria (0.032) Sobremesa (0.032) Tatuagem (0.032)

Table 2

Sentence fragments of Experiment 2 listed in order of descending single cloze probability. The cloze probability value appears after each word in parenthesis. The column 'Other Responses' lists all other words used to complete the sentence fragments with their cloze probability in parenthesis.

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
1	A Daniela para proteger as mãos foi buscar umas	luvas (1)	
2	A Diana gostou de todos os vestidos daquela	loja (1)	
3	A Fernanda esqueceu-se de trancar a	porta (1)	
4	A Joana está grávida e em breve vai notar-se a	barriga (1)	
5	A Joana para cortar os legumes usou aquela	faca (1)	
6	A mãe disse-lhe para levar um casaco porque estava	frio (1)	
7	A Maria pendurou o quadro naquela	parede (1)	
8	A menina não conseguia tirar o anel do	dedo (1)	
9	A Sara para proteger as mãos foi buscar umas	luvas (1)	
10	A educadora pediu-lhes para fazerem uma roda e darem as	mãos (1)	
11	Ele pegou na manteiga para barrar o	pão (1)	
12	O Afonso estava contente porque teve boas	notas (1)	
13	O Afonso estava radiante por ter tido tão boas	notas (1)	
14	O avô esteve a cuidar das flores do seu	jardim (1)	
15	O homem feriu a perna e teve de levar	pontos (1)	
16	O João foi provar aquele doce com pepitas de	chocolate (1)	
17	O menino esteve a tarde toda a arrumar o seu	quarto (1)	
18	O pai descobriu que a filha andava a faltar às	aulas (1)	
19	O Paulo guardou os seus lápis num	estojo (1)	
20	O Rafael estava tão cansado que mal conseguia subir as	escadas (1)	
21	Para andar na pista de gelo tinha de saber andar de	patins (1)	
22	Antes da consulta o médico pediu-lhe para fazer novos	exames (0.96)	movimento (0.04)
23	Como ficou em segundo lugar também recebeu um	prémio (0.96)	troféu (0.04)
24	O menino ficou de castigo porque teve más	notas (0.96)	atitudes (0.04)
25	A Carla estava a ver televisão deitada no	sofá (0.96)	chão (0.04)
26	O menino chegou atrasado à primeira	aula (0.96)	entrevista (0.04)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
27	A criança ainda não sabia comer usando os	talheres (0.95)	dedos (0.05)
28	O professor reparou que o texto tinha alguns	erros (0.95)	defeitos (0.05)
29	A mãe pediu-lhe para não fechar a	porta (0.95)	janela (0.05)
30	O Leonel distraiu-se ao cozinhar e cortou o	dedo (0.95)	braço (0.05)
31	A menina queria vestir nesse dia o seu novo	vestido (0.95)	casaco (0.05)
32	Como a dor nas costas não passava decidiu ir ao	médico (0.95)	hospital (0.05)
33	Como as calças estavam largas teve de colocar um	cinto (0.95)	fecho (0.05)
34	Como não queria estacionar na garagem deixou o carro na	rua (0.95)	entrada (0.05)
35	A Paula colocou os talheres na	mesa (0.94)	gaveta (0.06)
36	A professora aconselhou-o a fazer as contas usando a	calculadora (0.94)	tabuada (0.06)
37	O aluno fazia um desenho usando os coloridos	lápiz (0.94)	azuis (0.06)
38	O presidente esteve horas a preparar o	discurso (0.93)	jantar (0.07)
39	O actor queria muito ficar com aquele	papel (0.92)	parte (0.04) prémio (0.04)
40	O António tem carta de carro e também de	mota (0.92)	autocarro (0.08)
41	O namorado ofereceu-lhe um ramo de	flores (0.92)	rosas (0.08)
42	A equipa perdeu o campeonato apenas por dois	pontos (0.91)	golos (0.09)
43	Naquele dia o avião ia fazer o seu último	voo (0.91)	pedido (0.04) trajecto (0.04)
44	O Fábio comprou uma nova secretária para por no	quarto (0.91)	escritório (0.09)
45	O João foi a biblioteca consultar um	livro (0.91)	artigo (0.04) dicionário (0.04)
46	A Francisca foi ao jardim buscar duas pequenas	flores (0.91)	maçãs (0.09)
47	A Laura para perder peso iniciou uma nova	dieta (0.91)	corrida (0.05) vida (0.05)
48	A mãe pediu-lhe para ir comprar ovos ao	supermercado (0.91)	mercado (0.09)
49	Na viagem a Maria pediu ajuda para carregar a	mala (0.91)	bateria (0.05) bolsa (0.05)
50	O Jaime estava ansioso para que começassem as	aulas (0.91)	férias (0.09)
51	Quando acabou o secundário a Inês candidatou-se à	faculdade (0.91)	universidade (0.09)
52	A Carlota foi almoçar com as suas	amigas (0.90)	primas (0.10)
53	A empregada não conseguia entrar porque não tinha	chave (0.90)	autorização (0.05) espaço (0.05)
54	Ele usou o cachecol mas não estava assim tanto	frio (0.90)	calor (0.10)
55	A aluna não podia chegar atrasada aquela	aula (0.9)	cadeira (0.05) tarde (0.05)
56	A avó estava a fazer a sopa numa grande	panela (0.9)	tijela (0.1)
57	A Carlota comprou umas pulseiras para oferecer às suas	amigas (0.9)	tias (0.1)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
58	Antes de ir de férias o Joel fez a	mala (0.9)	barba (0.1)
59	Como chegou tão sujo a casa foi logo para a	banheira (0.9)	casa-de-banho (0.1)
60	O André reparou que tinha rasgado as suas	calças (0.9)	cuecas (0.05) folhas (0.05)
61	O João apontou o número novo da amiga no	telemóvel (0.9)	caderno (0.1)
62	O jogador lesionou-se e teve de ser operado ao	joelho (0.9)	braço (0.05) pé (0.05)
63	O pai encostou o carro na berma da	estrada (0.9)	rua (0.1)
64	O Pedro estava a coxear porque sentia uma dor no	pé (0.9)	joelho (0.1)
65	O professor alertou que iria terminar mais cedo a	aula (0.9)	tarefa (0.1)
66	Os caloiros foram todos almoçar à cantina da	faculdade (0.9)	escola (0.1)
67	Os escuteiros estiveram a construir alguns ninhos para os	pássaros (0.9)	cucos (0.05) pombos (0.05)
68	Para chegar ao miradouro ainda tinham de subir muitas	escadas (0.9)	colinas (0.05) ruelas (0.05)
69	Quando chegou a casa o Rafael foi passear os	cães (0.9)	filhos (0.1)
70	A Filipa colocou os pratos em cima da	mesa (0.90)	bancada (0.05) cabeça (0.05)
71	A Tânia não conseguia ouvir bem a chamada porque tinha pouca	rede (0.90)	audição (0.11)
72	O diretor decidiu premiar os melhores	alunos (0.90)	concorrentes (0.05) estudantes (0.05)
73	O Henrique foi comprar uma coleira para o seu	cão (0.90)	filho (0.05) gato (0.05)
74	A Maria não conseguia abrir a porta porque não sabia da	chave (0.88)	senha (0.08) parede (0.04)
75	Na primavera o jardim dos avós fica cheio de	flores (0.88)	folhas (0.08) árvores (0.04)
76	O Francisco limpou o nariz com um	lenço (0.88)	papel (0.08) cotonete (0.04)
77	Os pescadores estavam a lançar ao mar uma	rede (0.88)	isca (0.04) pesca (0.04) sardinha (0.04)
78	Quando ouviu os gritos na rua foi espreitar à	janela (0.88)	porta (0.13)
79	Antes de dormir a avó lia a	história (0.87)	revista (0.09) Manuel (0.04)
80	O Gaspar era muito popular e ia sempre a todas as	festas (0.87)	aulas (0.13)
81	O pai do André foi à escola falar com o	professor (0.87)	director (0.13)
82	Para manter a forma decidiu fazer exercício no	ginásio (0.87)	caderno (0.04) chão (0.04) parque (0.04)
83	Para atravessar o rio os escuteiros construíram uma	ponte (0.86)	jangada (0.14)
84	A Mariana foi fazer um piquenique e levou a comida num	cesto (0.85)	contentor (0.05) saco (0.05) tupperware (0.05)
85	A professora pediu-lhe para completar a	frase (0.85)	tarefa (0.1) pergunta (0.05)
86	O Miguel dá todos os dias ao gato um pouco de	comida (0.85)	ração (0.1) sopa (0.05)
87	A avó esteve a cuidar das flores do seu	jardim (0.85)	cão (0.08) neto (0.08)
88	Estava tanto calor que trocou os sapatos por umas	sandálias (0.84)	botas (0.05) havaianas (0.05) sabrinas (0.05)

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89	A Ana entrou na loja porque gostou da saia que viu na	montra (0.83)	vitrine (0.13) loja (0.04)
90	Depois da licenciatura o Hugo decidiu fazer um	mestrado (0.83)	curso (0.06) estágio (0.06) interrail (0.06)
91	O António foi à biblioteca consultar um	livro (0.83)	amigo (0.06) dicionário (0.06) site (0.06)
92	O pai pediu-lhe para ir buscar uma cerveja fresca ao	frigorífico (0.83)	café (0.06) congelador (0.06) supermercado (0.06)
93	O Tiago não deu gorjeta porque não tinha	dinheiro (0.83)	moedas (0.13) fugido (0.04)
94	Quando caiu a Salomé torceu o	pé (0.83)	pulso (0.08) tornozelo (0.04) nariz (0.04)
95	A criança estava a comer com um garfo e uma	faca (0.83)	colher (0.13) amiga (0.04)
96	O Augusto depois do jantar fumou um	cigarro (0.83)	charuto (0.09) charro (0.09)
97	Quando ia comer a sopa reparou que não tinha	colher (0.83)	sal (0.09) batata (0.04) sopa (0.04)
98	A menina antes de ir dormir bebeu um copo de	leite (0.82)	água (0.12) café (0.06)
99	A Conceição todos os dias limpa a	casa (0.82)	cozinha (0.09) sala (0.09)
100	A Rita fica sempre corada quando fala com aquele	rapaz (0.82)	amigo (0.09) menino (0.05) moleque (0.05)
101	Durante a noite o menino foi picado por um	mosquito (0.82)	insecto (0.14) bicho (0.05)
102	O António nas férias deixou crescer a	barba (0.82)	perna (0.09) planta (0.09)
103	O bebé meteu o brinquedo na	boca (0.82)	caixa (0.09) mão (0.09)
104	O rapaz deu-lhe o troco todo em	moedas (0.82)	notas (0.09) cêntimos (0.05) euros (0.05)
105	Os miúdos estavam contentes porque iam atravessar o rio num	barco (0.82)	bote (0.05) caiaque (0.05) dia (0.05) sítio (0.05)
106	A Inês pediu à mãe para pintar as	unhas (0.81)	aguarelas (0.06) janelas (0.06) paredes (0.06)
107	A educadora pediu-lhes antes de se sentarem para lavarem as	mãos (0.81)	malas (0.05) mantas (0.05) mesas (0.05) palavras (0.05)
108	O Nuno aponta tudo no seu	caderno (0.81)	bloco (0.10) telemóvel (0.10)
109	A Andreia foi à florista comprar	flores (0.8)	rosas (0.2)
110	A Francisca sabia que aquilo não era um mosquito era um outro	insecto (0.8)	bicho (0.15) animal (0.05)
111	A menina arrumou os casacos todos no	armário (0.8)	cabide (0.1) guarda-roupa (0.1)
112	O António tem carta de carros e também de	motas (0.8)	aviões (0.1) pesados (0.1)
113	Os bombeiros salvaram o gato que estava preso na	árvore (0.8)	casa (0.2)
114	A Sara riu-se muito quando lhe contaram aquela	piada (0.79)	anedota (0.13) história (0.08)
115	Como o chá estava tão quente queimou a	língua (0.79)	boca (0.13) mão (0.08)
116	O Miguel decidiu comprar pipocas quando foi ao	cinema (0.79)	supermercado (0.17) jardim (0.04)
117	A Raquel à refeição bebe sempre	água (0.79)	sumo (0.09) vinho (0.05) Coca-cola (0.02) Compal (0.02) leite (0.02)
118	O António foi à papelaria comprar uma	caneta (0.79)	caderneta (0.07) folha (0.07) revista (0.07)
119	O treinador estava chateado por terem perdido o	jogo (0.79)	torneio (0.14) campeonato (0.07)

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120	A avó cuida das flores do seu	jardim (0.78)	quintal (0.09) irmão (0.04) marido (0.04) neto (0.04)
121	A avó usa muitas vezes aquele colar de	pérolas (0.78)	ouro (0.09) diamantes (0.04) pintar (0.04) prata (0.04)
122	A Francisca quando esta nervosa costuma morder o	lábio (0.78)	dedo (0.22)
123	A Teresa estava tão cansada que sentou-se logo num	banco (0.78)	sofá (0.13) cadeirão (0.04) muro (0.04)
124	Como estava tanto calor abriu a	janela (0.78)	porta (0.17) capota (0.04)
125	O Filipe está sempre a jogar no	computador (0.78)	parque (0.09) campo (0.04) quarto (0.04) recreio (0.04)
126	O menino ficou de castigo por ter dito muitas	asneiras (0.78)	faltas (0.09) besteiras (0.09) mentiras (0.04)
127	O Vasco comprou há dois meses os bilhetes para o	concerto (0.78)	festival (0.09) espetáculo (0.09) teatro (0.04)
128	Todos os atletas no final da prova receberam um	prémio (0.78)	troféu (0.09) aplauso (0.04) bónus (0.04) diploma (0.04)
129	O piloto avisou que em breves minutos iria iniciar o	voou (0.78)	caminho (0.06) levantamento (0.06) motor (0.06) treino (0.06)
130	A mãe pediu-lhe para guardar os talheres na	gaveta (0.77)	cozinha (0.05) estante (0.05) fruteira (0.05) máquina (0.05) prateleira (0.05)
131	No final do curso receberam um	diploma (0.77)	prémio (0.18) certificado (0.05)
132	O Gonçalo deixou de gorjeta um	euro (0.77)	cêntimo (0.18) empregado (0.05)
133	O pai pediu-lhe para pendurar a camisa naquele	cabide (0.77)	armário (0.09) bengaleiro (0.09) roupeiro (0.05)
134	O Rui não queria fazer a aula de surf porque tinha	medo (0.77)	frio (0.14) caído (0.05) vergonha (0.05)
135	A Liliana colocou o lápis no	estojo (0.76)	cabelo (0.06) caderno (0.06) lábio (0.06) nariz (0.06)
136	A Maria foi para casa dos tios brincar com os	primos (0.76)	cães (0.10) bonecos (0.05) legos (0.05) tios (0.05)
137	O professor disse que só podiam fazer perguntas no final da	aula (0.76)	apresentação (0.05) experiência (0.05) prova (0.05) semana (0.05) sessão (0.05)
138	A professora disse-lhe para fazer as contas usando a	calculadora (0.75)	cabeça (0.25)
139	A rapariga estava à porta e não encontrava a	chave (0.75)	saída (0.1) amiga (0.05) mãe (0.05) Vanessa (0.05)
140	Antes de ir dormir o menino deu-lhe um	beijo (0.75)	abraço (0.06) brinquedo (0.06) chocolate (0.06) riso (0.06)
141	Aquele jardim estava repleto de belas	flores (0.75)	rosas (0.1) árvores (0.05) borboletas (0.05) meninas (0.05)
142	Como chegou atrasado ao aeroporto o Hugo perdeu o	avião (0.75)	voou (0.13) aeroporto (0.04) autocarro (0.04) comboio (0.04)
143	Ele estava tão chateado que bateu com a	porta (0.75)	cabeça (0.15) mão (0.1)
144	No verão a Sara prefere calçar as suas	sandálias (0.75)	meias (0.1) havaianas (0.1) sapatilhas (0.05)
145	O anel é muito caro porque tem um grande	diamante (0.75)	valor (0.15) brilhante (0.05) rubi (0.05)
146	O bebé brincou com o patinho enquanto estava na	banheira (0.75)	água (0.1) cama (0.05) casa (0.05) rua (0.05)
147	O Fernando não a deixou acabar de dizer a	frase (0.75)	palavra (0.2) história (0.05)
148	O Vítor colocou um pouco mais de doce no	pão (0.75)	prato (0.1) bolo (0.05) café (0.05) chá (0.05)
149	A avó todos os dias rega as suas	plantas (0.74)	flores (0.17) árvores (0.04) hortas (0.04)
150	A Carla esteve toda a tarde a limpar a	casa (0.74)	cozinha (0.09) cave (0.04) mesa (0.04) rua (0.04) sala (0.04)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
151	A Carolina foi brincar para casa da sua	amiga (0.74)	avó (0.13) mãe (0.09) prima (0.04)
152	Como estava uma noite fria a Inês foi buscar mais um	casaco (0.74)	cobertor (0.17) lençol (0.09)
153	O Alberto todos os sábados vai jogar	futebol (0.74)	xadrez (0.09) fora (0.04) Playstation (0.04) poker (0.04) ténis (0.04)
154	O Eduardo foi aos correios buscar as	cartas (0.74)	encomendas (0.26)
155	O médico pediu-lhe para fazer um	exame (0.74)	teste (0.13) desenho (0.04) TAC (0.04) radiografia (0.04)
156	O menino quando pousou o saco das compras partiu os	ovos (0.74)	copos (0.13) dentes (0.17) joelhos (0.11) vidros (0.11)
157	O pai disse-lhes que só podiam brincar depois de acabarem os	trabalhos (0.74)	deveres (0.17) estudos (0.04) testes (0.04)
158	O professor passou vários dias a corrigir os	testes (0.74)	exames (0.13) erros (0.09) alunos (0.04)
159	Nas férias a Maria queria ir muitas vezes à	praia (0.74)	aldeia (0.05) escola (0.05) feira (0.05) loja (0.05) Suécia (0.05)
160	A Joana não gosta da cor daquela	camisola (0.73)	blusa (0.09) lojas (0.09) mesa (0.09)
161	A Maria comprou mais um selo para a sua	coleção (0.73)	carta (0.23) amiga (0.05)
162	A Sara para ficar mais elegante calçou as suas bonitas	botas (0.73)	calças (0.09) luvas (0.09) sabrinas (0.09)
163	O Bruno quando chegou ao bar pediu uma	cerveja (0.73)	bica (0.09) imperial (0.09) maçã (0.09)
164	O Tiago mal chegou a casa tirou os	sapatos (0.73)	auscultadores (0.05) calções (0.05) dentes (0.05) fones (0.05) óculos (0.05) ténis (0.05)
165	O Tomás disse que oferecia o lanche se ganhasse aquele	jogo (0.73)	debate (0.09) prémio (0.09) treino (0.09)
166	Os meninos no intervalo foram comprar um saco de	gomas (0.73)	berlindes (0.09) comida (0.09) pulmas (0.09)
167	A praia tinha chuveiros para as pessoas poderem tomar um	banho (0.71)	duche (0.29)
168	No passeio pelo parque o Júlio deu comida aos	pombos (0.71)	pássaros (0.21) patos (0.07)
169	O Pedro deixa sempre o carro na	garagem (0.71)	avenida (0.07) estrada (0.07) loja (0.07) rua (0.07)
170	O Tiago depois da corrida ficou com dores na	perna (0.71)	barriga (0.14) anca (0.05) coluna (0.05) coxa (0.05)
171	Quando chegou a casa viu que tinha deixado aberta a	porta (0.71)	janela (0.24) cozinha (0.05)
172	A Adélia foi ao sapateiro buscar as suas	botas (0.71)	sandálias (0.25) sabrinas (0.04)
173	Como estava frio a Inês colocou na sua cama mais um	cobertor (0.71)	edredão (0.13) colchão (0.08) lençol (0.08)
174	Como faltou à aula pediu a uma colega para copiar os	apontamentos (0.71)	slides (0.13) trabalhos (0.08) resumos (0.04) TPC (0.04)
175	Depois de pintar o quadro o João foi comprar novas	tintas (0.71)	telas (0.13) roupas (0.08) botas (0.04) canetas (0.04)
176	O Gonçalo escreveu à namorada um bonito	poema (0.71)	texto (0.17) bilhete (0.08) cartão (0.04)
177	Para finalizar a prova tinham de escrever um	texto (0.71)	poema (0.17) ditado (0.04) resumo (0.04) transporte (0.04)
178	A Marta quando conduz costuma ouvir	música (0.71)	vozes (0.12) pop (0.06) rádio (0.06) rock (0.06)
179	A aluna esqueceu-se de imprimir o	trabalho (0.70)	relatório (0.2) livro (0.1)
180	A aluna estava tão cansada que não conseguia acabar os	trabalhos (0.70)	testes (0.2) exames (0.1)
181	A Madalena esqueceu-se de entregar o relatório ao seu	professor (0.70)	médico (0.15) chefe (0.05) patrão (0.05) supervisor (0.05)

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182	A transportadora não conseguiu entregar a tempo todas as	encomendas (0.70)	caixas (0.1) entregas (0.1) mobílias (0.05) pizzas (0.05)
183	O Nuno tomou os suplementos recomendados pela sua	médica (0.70)	nutricionista (0.15) mãe (0.1) namorada (0.05)
184	Por causa da tempestade decidiram não viajar naquele	dia (0.70)	avião (0.1) barco (0.1) momento (0.1)
185	A avó cuida com gosto das suas	netas (0.70)	flores (0.09) plantas (0.09) roupas (0.09) filhas (0.04)
186	A grávida passou aquele mês cheia de	dores (0.70)	enjoos (0.13) cólicas (0.09) desejos (0.04) fome (0.04)
187	A Júlia só soube do acidente quando viu as	notícias (0.70)	ambulância (0.04) cicatrizes (0.04) feridas (0.04) fotografias (0.04) fotos (0.04) mensagens (0.04) vítimas (0.04)
188	A mãe pediu-lhe para ir buscar a panela à	cozinha (0.70)	tia (0.09) gaveta (0.09) avó (0.04) casa (0.04) dispensa (0.04)
189	A Vânia guardou o talão na sua	carteira (0.70)	mala (0.17) bolsa (0.04) casa (0.04) compra (0.04)
190	Antes de ir dormir a Marisa bebeu um copo de	Leite (0.70)	água (0.22) chá (0.04) vinho (0.04)
191	Como emagreceu tanto a Raquel teve de comprar novas	roupas (0.70)	calças (0.22) camisolas (0.09)
192	Como estava doente a Fernanda não foi à	escola (0.70)	aula (0.17) festa (0.09) missa (0.04)
193	Como estava muito cansada decidiu ir cedo para a	cama (0.70)	casa (0.13) faculdade (0.09) escola (0.04) festa (0.04)
194	O cão passou a tarde a roer os	ossos (0.70)	tapetes (0.22) móveis (0.04) tapetes (0.04)
195	O Eduardo passa muitas horas a jogar no seu	computador (0.70)	telemóvel (0.22) jardim (0.04) videojogos (0.04)
196	O pai arrumou a caixa de ferramentas na	garagem (0.70)	despensa (0.09) arrecadação (0.04) cave (0.04) estante (0.04) oficina (0.04) prateleira (0.04)
197	O pai costuma ler todos os dias o	jornal (0.70)	livro (0.17) diário (0.09) filho (0.04)
198	O pai tentava ensiná-la a andar de	bicicleta (0.70)	patins (0.13) carro (0.09) frente (0.04) mota (0.04)
199	O Rafael tem um sono leve e acorda com qualquer	barulho (0.70)	coisa (0.17) ruído (0.09) impressão (0.04)
200	O Vítor não teve nota máxima porque falhou uma	pergunta (0.70)	resposta (0.17) frequência (0.04) letra (0.04) questão (0.04)
201	Para chegar ao décimo andar a Mara ia sempre de	elevador (0.70)	escadas (0.30)
202	Durante o acampamento o Rui foi picado por um	mosquito (0.68)	insecto (0.16) escorpião (0.05) bicho (0.05) abelhão (0.05)
203	O avô amarrou a saca com aquela	corda (0.68)	fita (0.23) peça (0.05) vara (0.05)
204	O César acordou sobressaltado quando tocou o	despertador (0.68)	alarme (0.14) telemóvel (0.14) telefone (0.05)
205	O Eduardo antes de sair de casa faz sempre a	cama (0.68)	barba (0.18) mala (0.09) coisas (0.05)
206	O Gil dizia que se ganhasse o euromilhões compraria uma	casa (0.68)	mota (0.23) caravana (0.05) escrava (0.05)
207	No final do estágio o Luís tinha de entregar um	relatório (0.67)	trabalho (0.21) exame (0.04) papel (0.04) resumo (0.04)
208	O adepto estava triste porque já não arranhou nenhum	bilhete (0.67)	amigo (0.22) apoiante (0.11)
209	O apresentador estava a gravar um novo	programa (0.67)	episódio (0.08) take (0.08) audio (0.04) disco (0.04) filme (0.04) vídeo (0.04)
210	O Henrique não foi correr por causa do	tempo (0.67)	joelho (0.13) amigo (0.04) cansaço (0.04) jogo (0.04) pai (0.04) Ricardo (0.04)
211	Quando ia começar a comer a sobremesa viu que não tinha	colher (0.67)	talheres (0.21) açúcar (0.04) alma (0.04) fome (0.04)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
212	Quando sai à noite a Joana vai sempre aquela	discoteca (0.67)	loja (0.22) camisola (0.11)
213	Aos sábados a mãe costuma ir às compras ao	supermercado (0.66)	mercado (0.13) Shopping (0.11) Continete (0.05) Colombo (0.03) Fórum (0.03)
214	A Helena foi ao museu ver a nova	exposição (0.65)	arte (0.09) peça (0.04) escultura (0.04) estátua (0.04) múmia (0.04) obra (0.04) pintura (0.04)
215	A Júlia guardou os sapatos numa	caixa (0.65)	gaveta (0.13) prateleira (0.13) estante (0.04) sapateira (0.04)
216	A Lara estava tão feliz por receber aquele anel de	noivado (0.65)	diamantes (0.13) ouro (0.09) prata (0.09) rubi (0.04)
217	A Marisa fez um sumo de	laranja (0.65)	maçã (0.13) uva (0.09) limão (0.04) maracujá (0.04) manga (0.04)
218	A Vera pede sempre uma fatia de bolo de	chocolate (0.65)	laranja (0.13) iogurte (0.09) morango (0.09) noz (0.04)
219	O menino estava a chorar porque se magoou no	joelho (0.65)	pé (0.17) braço (0.04) dedo (0.04) escorrega (0.04) ombro (0.04)
220	O menino não chegava ao livro que estava na última	prateleira (0.65)	estante (0.17) ficha (0.04) gaveta (0.04) página (0.04) semana (0.04)
221	Para cobrir as costas a avó usava sempre um	xaile (0.65)	lenço (0.13) casaco (0.09) agasalho (0.04) cachecol (0.04) cobertor (0.04)
222	A secretária apontou à pressa o recado num	papel (0.65)	caderno (0.2) bloco (0.05) livro (0.05) post-it (0.05)
223	O aluno de erasmus queria conhecer novas pessoas e diversas	culturas (0.65)	aventuras (0.05) cidades (0.05) discotecas (0.05) etnias (0.05) festas (0.05) novidades (0.05) personalidades (0.05)
224	O aluno teve o melhor resultado da sua	turma (0.65)	vida (0.3) resposta (0.05)
225	O Rui ficou a trabalhar até tarde e decidiu avisar a	mãe (0.65)	mulher (0.2) avó (0.05) esposa (0.05) namorada (0.05)
226	Os náufragos para sair da ilha construíram uma	jangada (0.65)	canoa (0.18) cabana (0.06) nau (0.06) ponte (0.06)
227	O Fernando prefere ir estudar para a	biblioteca (0.64)	sala (0.21) escola (0.07) sótão (0.07)
228	A avó antes de ir podar calçou umas	botas (0.64)	luvas (0.27) meias (0.09)
229	A Filipa não conseguiu ligar porque tinha pouca	bateria (0.64)	rede (0.27) carga (0.09)
230	A Helena não conseguia dançar porque lhe doía o	pé (0.64)	joelho (0.09) tornozelo (0.09) coração (0.05) ombro (0.05) pescoço (0.05) rabo (0.05)
231	A Mónica antes de ir ao supermercado fez uma	lista (0.64)	chamada (0.05) compra (0.05) festa (0.05) paragem (0.05) permanente (0.05) pesquisa (0.05) sandes (0.05) tarte (0.05)
232	A princesa nessa noite usou o seu novo anel de	noivado (0.64)	diamantes (0.18) ouro (0.09) rubi (0.09)
233	Ele plantou mais de dezena de árvores de fruto no seu	quintal (0.64)	jardim (0.36)
234	Junto ao mar voava um conjunto de	gaivotas (0.64)	pássaros (0.27) aves (0.09)
235	O agente disse para apresentar queixa na	polícia (0.64)	esquadra (0.36)
236	O Dinis gosta de dormir naquela	cama (0.64)	casa (0.09) hora (0.09) posição (0.09) sala (0.09)
237	O professor ficou chateado porque ninguém sabia a	resposta (0.64)	matéria (0.27) solução (0.05) pergunta (0.05)
238	O sonho da mãe do João era que ele entrasse na	faculdade (0.62)	universidade (0.21) escola (0.10) academia (0.03) Católica (0.03)
239	O pai disse-lhe para ter cuidado ao atravessar a	rua (0.62)	estrada (0.38)
240	A Catarina sobrevoou a cidade num	avião (0.62)	helicóptero (0.23) jacto (0.08) unicórnio (0.08)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
241	A avó vai sempre comprar legumes ao	mercado (0.61)	supermercado (0.35) Continente (0.04)
242	A professora pediu-lhe para fazer o desenho no	quadro (0.61)	caderno (0.35) papel (0.04)
243	Naquela noite os jovens decidiram ir a uma	festa (0.61)	discoteca (0.26) praia (0.09) loja (0.04)
244	O avô plantou mais uma árvore no	quintal (0.61)	jardim (0.26) pomar (0.09) chão (0.04)
245	O Paulo queria aprender novas músicas para tocar na sua	guitarra (0.61)	festa (0.09) viola (0.09) harpa (0.09) banda (0.04) flauta (0.04) gaita (0.04)
246	O Pedro pediu ajuda ao pai para dar um nó naquela	gravata (0.61)	corda (0.13) árvore (0.04) bota (0.04) camisola (0.04) garganta (0.04) prenda (0.04) toalha (0.04)
247	Quando abriu a bolsa viu que se tinha esquecido da	carteira (0.61)	chave (0.22) caneta (0.04) mala (0.04) maquilhagem (0.04) pasta (0.04)
248	Quando estava a lavar a loiça a Laura partiu um	prato (0.61)	copo (0.30) garfo (0.04) pano (0.04)
249	A mãe descobriu que a filha dizia muitas	asneiras (0.60)	mentiras (0.2) coisas (0.1) negas (0.1)
250	A Margarida adora dançar por isso vai a muitas	festas (0.60)	aulas (0.2) discotecas (0.15) apresentações (0.05)
251	A Mariana perdeu os seus preciosos brincos de	ouro (0.60)	prata (0.3) diamantes (0.05) pérolas (0.05)
252	A planta era muito grande para pôr naquele	vaso (0.60)	canto (0.1) jarro (0.1) local (0.1) lugar (0.1)
253	A professora recomendou que todos lessem o	livro (0.60)	capítulo (0.3) memorial (0.05) texto (0.05)
254	Ao passar no túnel os passageiros ficaram sem	luz (0.60)	ar (0.2) rede (0.2)
255	No verão a Cristina decidiu pintar a	casa (0.60)	parede (0.11) sala (0.09) praia (0.04) avó (0.02) cadeira (0.02) cara (0.02) garagem (0.02) paisagem (0.02) roupa (0.02) tela (0.02)
256	O João não conseguiu imprimir o relatório porque não tinha	tinteiro (0.60)	tinta (0.2) impressora (0.1) papel (0.1)
257	O Pedro foi aos correios levantar as	cartas (0.60)	encomendas (0.3) caixas (0.1)
258	Os assaltantes roubaram um valioso anel de	diamantes (0.6)	noivado (0.1) ouro (0.1) rubi (0.1) pérola (0.05) prata (0.05)
259	Quando olhou para a sua mão viu que tinha perdido o	anel (0.60)	telemóvel (0.15) dedo (0.1) chapéu (0.05) lápis (0.05) relógio (0.05)
260	A Marisa quando abriu a carteira viu que não tinha nenhuma	moeda (0.60)	nota (0.41)
261	A Rita adora ir para a praia ver as	ondas (0.60)	gaivotas (0.14) vistas (0.09) amigas (0.05) conchinhas (0.05) meninas (0.05) pessoas (0.05)
262	O atleta falhou o pódio apenas por uns	segundos (0.60)	pontos (0.14) minutos (0.09) instantes (0.05) metros (0.05) passos (0.05) milissegundos (0.05)
263	O Eduardo foi procurar o livro à	biblioteca (0.60)	estante (0.09) livraria (0.09) amiga (0.05) Bulhosa (0.05) mochila (0.05) prateleira (0.05) rua (0.05)
264	O Manuel foi à garagem buscar o	carro (0.60)	cão (0.09) berbequim (0.05) comando (0.05) computador (0.05) detergente (0.05) escadote (0.05) prego (0.05) telemóvel (0.05)
265	O Nuno ao domingo costuma ver um	filme (0.60)	programa (0.18) documentário (0.14) amigo (0.05) carro (0.05)
266	O Rui precisava de trocar a pilha do	comando (0.60)	relógio (0.27) monitor (0.05) rádio (0.05) telemóvel (0.05)
267	A avó todos os dias vai fazer uma caminhada no	parque (0.59)	jardim (0.18) caminho (0.06) lago (0.06) paredão (0.06) pátio (0.06)
268	A Francisca estava a aprender a tocar	piano (0.58)	violino (0.21) flauta (0.13) guitarra (0.04) músicas (0.04)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
269	A menina estava triste porque tirou má nota no	teste (0.58)	exame (0.42)
270	A menina pediu ao avô para lhe encher o	copo (0.58)	depósito (0.08) jarro (0.08) prato (0.08) quarto (0.08) saco (0.08)
271	Naquela praia decorria um torneio de	voleibol (0.58)	futebol (0.38) surf (0.04)
272	O artista não podia pintar porque precisava de novas	tintas (0.58)	telas (0.13) aguarelas (0.08) cores (0.08) coisas (0.04) pintas (0.04) ideias (0.04)
273	O José esperou horas na fila para conseguir comprar os	bilhetes (0.58)	tênis (0.08) jogos (0.08) livros (0.08) biscoitos (0.04) cigarros (0.04) filhos (0.04) fones (0.04)
274	O Frederico decidiu não passar a ferro o	casaco (0.58)	blusão (0.05) calção (0.05) camiseiro (0.05) cinto (0.05) colete (0.05) fato (0.05) gorro (0.05) pijama (0.05)
275	A aluna receava não ter estudado o suficiente para a	prova (0.57)	ficha (0.14) frequência (0.10) apresentação (0.05) aula (0.05) avaliação (0.05) tarefa (0.05)
276	A Carla queria comprar para a sua sala um novo	sofá (0.57)	candeeiro (0.14) computador (0.10) quadro (0.10) televisor (0.10)
277	A Inês estava a pintar as	unhas (0.57)	paredes (0.36) calças (0.07)
278	A menina estava a fazer castelos na praia com um	balde (0.57)	amigo (0.19) menino (0.10) rapaz (0.10) material (0.05)
279	O António não gostava de vestir aquelas	calças (0.57)	roupas (0.24) meias (0.10) blusas (0.05) camisolas (0.05)
280	O Artur não conseguia trabalhar porque tinha uma grande dor de	cabeça (0.57)	dentes (0.24) barriga (0.14) cotovelo (0.05)
281	O bebé deixou cair ao chão o	brinquedo (0.57)	biberão (0.19) urso (0.10) chocolate (0.05) prato (0.05) talher (0.05)
282	O João demorou muito tempo a ler aquele	livro (0.57)	artigo (0.24) texto (0.10) bilhete (0.05) documento (0.05)
283	O Manuel usa sempre no seu braço direito um	relógio (0.57)	elástico (0.14) lenço (0.10) anel (0.05) bracelete (0.05) coração (0.05) objecto (0.05)
284	Os meninos estavam a perder o jogo por dois	pontos (0.57)	golos (0.19) zero (0.24)
285	A Leonor foi à festa de anos da sua	amiga (0.57)	prima (0.35) mãe (0.04) namorada (0.04)
286	A mãe disse-lhe para colocar o livro na	estante (0.57)	prateleira (0.30) mala (0.04) mesa (0.04) mochila (0.04)
287	A menina passou a tarde a brincar com as	bonecas (0.57)	amigas (0.43)
288	O Eduardo estava ansioso para ir ver aquele	filme (0.57)	concerto (0.13) jogo (0.13) actor (0.04) circo (0.04) musical (0.04) teatro (0.04)
289	O Francisco não consegue engomar as	camisas (0.57)	calças (0.35) camisolas (0.04) roupas (0.04)
290	O Frederico aprendeu uma nova música para tocar no	piano (0.57)	baixo (0.13) violino (0.09) auditório (0.04) casamento (0.04) concerto (0.04) musical (0.04) trabalho (0.04)
291	O Henrique a jogar à bola rompeu as	calças (0.57)	meias (0.26) sapatilhas (0.09) cuecas (0.04) botas (0.04)
292	O Jorge estava a passear no parque com o seu	cão (0.57)	amigo (0.17) irmão (0.09) cachorro (0.04) filho (0.04) namorado (0.04) primo (0.04)
293	O menino levou para o lanche duas	sandes (0.57)	maças (0.22) bolachas (0.09) bananas (0.04) peras (0.04) tangerinas (0.04)
294	O pai disse-lhe para ir lavar os	dentes (0.57)	pés (0.17) pratos (0.09) tênis (0.09) calções (0.04) dedos (0.04)
295	O pai do André contava sempre aquela	história (0.57)	anedota (0.30) piada (0.13)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
296	O pai pediu-lhe para ir lá fora levar o	lixo (0.57)	cão (0.22) carro (0.09) almoço (0.04) pão (0.04) saco (0.04)
297	O professor pediu-lhe para ler aquele	texto (0.57)	livro (0.26) excerto (0.09) artigo (0.04) trabalho (0.04)
298	Os miúdos estavam contentes porque iam começar as	aulas (0.57)	férias (0.43)
299	A Maria apenas por duas décimas não entrou naquela	faculdade (0.56)	escola (0.22) prova (0.11) trem (0.11)
300	Naquele apartamento as flores crescem vigorosamente na	varanda (0.56)	janela (0.22) marquise (0.06) parede (0.06) relva (0.06) terra (0.06)
301	O Afonso pediu à mãe para lhe coser aquelas	meias (0.56)	calças (0.44)
302	A Carlota para resolver a equação teve de pedir ajuda ao	professor (0.55)	pai (0.2) João (0.1) avô (0.05) colega (0.05) Miguel (0.05)
303	A Mariana foi jantar com o seu	namorado (0.55)	pai (0.2) tio (0.1) amigo (0.1) afilhado (0.05)
304	Como o bebé estava doente a mãe decidiu ligar à	médica (0.55)	avó (0.1) enfermeira (0.1) pediatra (0.1) doutora (0.05) escola (0.05) mãe (0.05)
305	Depois do ginásio o Hugo só teve tempo de tomar um	banho (0.55)	duche (0.35) café (0.05) comprimido (0.05)
306	O professor ia ter uma reunião com o reitor da	escola (0.55)	faculdade (0.3) universidade (0.15)
307	A avó dá sempre ao neto um pacote de	bolachas (0.55)	gomas (0.18) rebuçados (0.14) chocolates (0.05) leite (0.05) pastilhas (0.05)
308	A avó do Henrique nunca andou de	bicicleta (0.55)	avião (0.36) carro (0.09)
309	A Daniela comprou o caderno naquela	loja (0.55)	papelaria (0.32) gráfica (0.05) retrosaria (0.05) noite (0.05)
310	A Maria não resistiu e comeu mais um bocado de	bolo (0.55)	chocolate (0.36) gelado (0.05) tarte (0.05)
311	A professora pediu-lhe para fazer o desenho naquela	folha (0.55)	parede (0.14) tarde (0.09) altura (0.05) hora (0.05) mesa (0.05) posição (0.05) tela (0.05)
312	O André já comprou o cavalete para as suas	pinturas (0.55)	aulas (0.27) obras (0.18)
313	O avô plantou no seu jardim mais uma	árvore (0.55)	flor (0.27) rosa (0.09) ameixoeira (0.05) macieira (0.05)
314	O menino não sabia que a borboleta era um	animal (0.55)	insecto (0.27) bicho (0.18)
315	O Tiago não teve muita piada a contar aquela	piada (0.55)	história (0.27) anedota (0.18)
316	Para esconder a cicatriz no pescoço a Francisca usa sempre um	cachecol (0.55)	colar (0.27) lenço (0.18)
317	A senhora pediu um galão e uma	torrada (0.54)	sandes (0.17) tosta (0.13) bolacha (0.08) pão (0.04) torta (0.04)
318	O Daniel comprou os manuais naquela	loja (0.54)	livraria (0.17) papelaria (0.13) semana (0.08) escola (0.04) zona (0.04)
319	O José chegou atrasado ao trabalho por causa do	trânsito (0.54)	metro (0.13) cão (0.08) acidente (0.04) autocarro (0.04) comboio (0.04) filho (0.04) tempo (0.04) temporal (0.04)
320	O Rodrigo tropeçou ao subir a	escada (0.54)	árvore (0.08) rampa (0.08) rua (0.08) cadeira (0.04) colina (0.04) escadaria (0.04) montanha (0.04) torre (0.04)
321	A Sofia quando está nervosa fica com dores de	cabeça (0.54)	costas (0.23) barriga (0.15) garganta (0.08)
322	A Raquel viu um vestido muito bonito na	Loja (0.53)	Mango (0.18) Zara (0.12) montra (0.12) rua (0.06)
323	A mãe pediu-lhe para ir buscar a roupa que estava na	lavandaria (0.52)	cama (0.10) máquina (0.10) rua (0.10) varanda (0.10) mesa (0.05) sala (0.05)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
324	O Igor acordou a meio da noite com um	pesadelo (0.52)	amigo (0.05) barulho (0.05) grito (0.05) mosquito (0.05) ruído (0.05) sobressalto (0.05) som (0.05) susto (0.05) telefonema (0.05) vómito (0.05)
325	O Manuel comprou aquele selo para a sua	carta (0.52)	colecção (0.10) irmã (0.10) amiga (0.05) caderneta (0.05) carteira (0.05) encomenda (0.05) mãe (0.05) mulher (0.05)
326	O menino não entrou porque estava com medo do	cão (0.52)	escuro (0.24) ladrão (0.10) homem (0.05) monstro (0.05) professor (0.05)
327	O neto ajudou a avó a abrir o frasco de	compota (0.52)	mel (0.14) doce (0.05) feijão (0.05) geleia (0.05) marmelada (0.05) pickles (0.05) salsichas (0.05) sumo (0.05)
328	O Nuno foi ver a nova exposição daquele	pintor (0.52)	artista (0.24) museu (0.10) dia (0.05) lugar (0.05) senhor (0.05)
329	A impressora não imprimiu porque não tinha	tinta (0.52)	tinteiro (0.26) papel (0.13) folhas (0.09)
330	A Joana gostou muito do vestido que viu na	loja (0.52)	montra (0.17) Zara (0.13) festa (0.04) Mango (0.04) Primark (0.04) televisão (0.04)
331	A Maria arrumou a vassoura na	despensa (0.52)	cozinha (0.26) arrecadação (0.04) cave (0.04) garagem (0.04) gaveta (0.04) sala (0.04)
332	A mosca ficou presa numa	teia (0.52)	rede (0.17) janela (0.09) gaveta (0.04) persiana (0.04) porta (0.04) racha (0.04) raquete (0.04)
333	A Tânia mostrou as fotografias que tinha guardadas no	telemóvel (0.52)	computador (0.26) fotografia (0.09) álbum (0.09) quarto (0.04)
334	A Teresa apontou o código no	telemóvel (0.52)	caderno (0.39) braço (0.04) papel (0.04)
335	Enquanto preparava a comida a Sónia queimou a	mão (0.52)	panela (0.09) massa (0.09) carne (0.09) dedo (0.04) frigideira (0.04) língua (0.04) roupa (0.04) toalha (0.04)
336	O Jaime estava ansioso para que chegassem as	férias (0.52)	notas (0.22) aulas (0.09) amigas (0.04) encomendas (0.04) primas (0.04) festas (0.04)
337	O Pedro decidiu fazer uma tatuagem no	braço (0.52)	ombro (0.30) corpo (0.04) pé (0.04) pescoço (0.04) rabo (0.04)
338	O Tomás ofereceu à namorada uma caixa de	chocolates (0.52)	bombons (0.30) gomas (0.04) joias (0.04) pensos (0.04) rebuçados (0.04)
339	Os meninos iam todos os dias de autocarro para o	colégio (0.52)	trabalho (0.13) baile (0.04) centro (0.04) estádio (0.04) jardim (0.04) metro (0.04) recinto (0.04) recreio (0.04) treino (0.04)
340	Quando abriu a carteira viu que tinha perdido um	cartão (0.52)	euro (0.17) cêntimo (0.17) documento (0.04) sapato (0.04) telemóvel (0.04)
341	Todas as semanas o Bruno vai visitar o avô ao	lar (0.52)	hospital (0.30) campo (0.04) cemitério (0.04) parque (0.04) Porto (0.04)
342	A avó foi passear com os netos para o	parque (0.50)	jardim (0.35) rio (0.1) zoo (0.05)
343	A avó gosta de se sentar naquele	banco (0.50)	sofá (0.32) cadeirão (0.09) lugar (0.05) sítio (0.05)
344	A avó vai sempre ao mercado comprar os	legumes (0.50)	bolos (0.1) doces (0.1) ovos (0.1) pães (0.1) vegetais (0.1)
345	A bailarina ainda não tinha decorado a nova	coreografia (0.50)	dança (0.36) fala (0.05) música (0.05) saia (0.05)
346	A Daniela não conseguia estudar porque tinha muito	sono (0.50)	barulho (0.17) stress (0.17) medo (0.08) trabalho (0.08)
347	A estilista disse-lhes que tinham dois dias para acabarem os	trabalhos (0.50)	vestidos (0.4) treinos (0.1)
348	A Fernanda guarda as suas valiosas joias no	cofre (0.50)	armário (0.15) baú (0.1) caixa (0.05) guarda-joias (0.05) joalheiro (0.05) quarto (0.05) saco (0.05)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
349	A Francisca foi ao jardim buscar mais duas	flores (0.50)	rosas (0.2) maçãs (0.15) amigas (0.05) cervejas (0.05) margaridas (0.05)
350	A Juliana colocou todas as frutas naquele	cesto (0.50)	jarro (0.1) saco (0.1) vaso (0.1) prato (0.1) balde (0.05) lado (0.05)
351	A Mariana depois de tomar banho vestiu o	pijama (0.50)	robe (0.17) vestido (0.17) casaco (0.08) bódi (0.04) roupão (0.04)
352	A Matilde escorregou quando estava a sair da	escola (0.50)	aula (0.1) carrinha (0.1) casa (0.1) praia (0.1) sala (0.1)
353	A menina disse ao pai que não gostava de nenhuma menina daquela	turma (0.5)	escola (0.2) idade (0.1) sala (0.1) cor (0.05) festa (0.05)
354	A menina leu em voz alta um bonito	poema (0.5)	texto (0.36) cartão (0.05) conto (0.05) recado (0.05)
355	A professora levou todos os exames na sua	mala (0.5)	pasta (0.45) sala (0.05)
356	Antes de entrar no consultório teve de preencher uma	ficha (0.5)	folha (0.13) autorização (0.04) carta (0.04) coisa (0.04) declaração (0.04) formulário (0.04) minimercado (0.04) papelada (0.04) questionário (0.04) requisição (0.04)
357	Depois da caminhada viu que tinha as sapatilhas cheias de	lama (0.5)	terra (0.29) pastilha (0.08) arreia (0.04) lixo (0.04) sujidade (0.04)
358	O advogado estava há três horas numa	reunião (0.5)	audiência (0.2) conferência (0.15) sala (0.1) fila (0.05)
359	O artista encheu de cores muito vibrantes as suas	obras (0.5)	pinturas (0.3) telas (0.2)
360	O empresário já estava há mais de duas horas naquela	reunião (0.5)	sala (0.3) fila (0.1) lengalenga (0.05) situação (0.05)
361	O ferido em estado muito grave foi transportado de	ambulância (0.5)	helicóptero (0.23) avião (0.14) carro (0.05) maca (0.05) seguida (0.05)
362	O Francisco colocou o livro na	estante (0.5)	prateleira (0.29) mala (0.08) mochila (0.08) biblioteca (0.04)
363	O funcionário pediu-lhe ajuda para conseguir acabar aquele	trabalho (0.5)	relatório (0.17) inquérito (0.13) exame (0.04) projecto (0.04) registo (0.04) serviço (0.04) teste (0.04)
364	O Marcelo não tinha dinheiro para pagar a	conta (0.5)	faculdade (0.2) comida (0.1) escola (0.1) renda (0.1)
365	O pai todos os dias vai regar o	jardim (0.5)	quintal (0.32) canteiro (0.09) arbusto (0.05) pessegueiro (0.05)
366	O Simão colocou um piercing no	umbigo (0.5)	nariz (0.42) lábio (0.04) ouvido (0.04)
367	O Simão tinha uma pequena marca de nascença no	pescoço (0.5)	ombro (0.2) braço (0.1) joelho (0.1) umbigo (0.1)
368	O Tiago estava muito cansado e adormeceu na	sala (0.5)	cama (0.25) aula (0.1) mesa (0.1) rua (0.05)
369	Os turistas decidiram sobrevoar a cidade de	Lisboa (0.5)	avião (0.3) Paris (0.2)
370	Para chegar ao miradouro tinha de subir mais	escadas (0.5)	alto (0.38) montanhas (0.13)
371	Para fazer o exercício a Cíntia pediu ao colega a	caneta (0.5)	folha (0.09) borracha (0.09) resposta (0.09) calculadora (0.05) plataforma (0.05) resolução (0.05) roupa (0.05)
372	Quando anda de barco a Leonor fica com	enjoos (0.5)	náuseas (0.17) medo (0.17) dores (0.08) contente (0.04) frio (0.04)
373	Tiago costuma fazer yoga no	ginásio (0.5)	parque (0.17) jardim (0.13) centro (0.04) chão (0.04) pavilhão (0.04) quarto (0.04) verão (0.04)
374	Todos os dias o pai leva os filhos ao	colégio (0.5)	parque (0.14) dentista (0.14) átrio (0.07) teatro (0.07) trabalho (0.07)
375	A avó antes de dormir vê sempre as	novelas (0.48)	notícias (0.17) horas (0.09) estrelas (0.09) contas (0.04) filhas (0.04) janelas (0.04) netas (0.04)
376	A Bianca comprou um novo vestido para levar ao	baile (0.48)	casamento (0.48) jantar (0.04)

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377	A Fernanda gosta muito de ler	livros (0.48)	romances (0.30) ficção (0.09) revistas (0.04) Saramago (0.04) Kafka (0.04)
378	A Inês quase foi atropelada quando atravessava a	rua (0.48)	estrada (0.30) passadeira (0.22)
379	A Joana decidiu pintar o seu	quarto (0.48)	cabelo (0.35) retrato (0.09) desenho (0.04) quadro (0.04)
380	A Vânia ia fazer um bolo mas reparou que não tinha	farinha (0.48)	ovos (0.22) açúcar (0.13) leite (0.09) fermento (0.04) ingredientes (0.04)
381	Ao entregar a carta reparou que se tinha esquecido do	selo (0.48)	endereço (0.09) envelope (0.09) nome (0.09) remetente (0.09) cartão (0.04) comprovativo (0.04) conteúdo (0.04) postal (0.04)
382	Como não se sentia bem a Andreia ligou ao seu	pai (0.48)	namorado (0.30) amigo (0.13) avô (0.04) médico (0.04)
383	Como não tinha o livro foi comprá-lo aquela	loja (0.48)	livraria (0.30) papelaria (0.22)
384	No jogo de andebol o Rui deslocou o	ombro (0.48)	braço (0.17) cotovelo (0.09) pé (0.09) pulso (0.09) dedo (0.04)
385	O Afonso foi expulso da aula porque bateu no	colega (0.48)	professor (0.22) João (0.13) amigo (0.09) Miguel (0.04) André (0.04)
386	O cirurgião tentou tudo para salvar aquele	paciente (0.48)	homem (0.17) rapaz (0.13) doente (0.09) menino (0.09) miúdo (0.04)
387	O Francisco queria colocar na parede o	quadro (0.48)	poster (0.30) cartaz (0.04) irmão (0.04) pai (0.04) papel (0.04) relógio (0.04)
388	O Frederico guardou o martelo na	caixa (0.48)	garagem (0.13) gaveta (0.13) mala (0.13) mochila (0.09) arrecadação (0.04)
389	O Guilherme enjoo sempre que anda de	carro (0.48)	barco (0.26) comboio (0.13) avião (0.09) mota (0.04)
390	O jogador não gostou da decisão do	treinador (0.48)	arbitro (0.43) mister (0.09)
391	O Rui depois de almoçar tomou um	café (0.48)	comprimido (0.39) banho (0.04) relaxante (0.04) sumo (0.04)
392	O Samuel foi visitar o seu avô ao	hospital (0.48)	lar (0.30) aldeamento (0.04) barco (0.04) cemitério (0.04) jardim (0.04) norte (0.04)
393	O Tomás passa horas a jogar consola em casa do	amigo (0.48)	João (0.22) Alberto (0.04) avô (0.04) colega (0.04) irmão (0.04) Pedro (0.04) primo (0.04) Vasco (0.04)
394	A menina canta e dança muito bem é mesmo uma	artista (0.48)	bailarina (0.14) dançarina (0.10) profissional (0.10) antipática (0.05) estrela (0.05) princesa (0.05) talentosa (0.05)
395	Depois de marcar a viagem ainda tinham de reservar o	hotel (0.48)	bilhete (0.24) lugar (0.10) alojamento (0.05) avião (0.05) quarto (0.05) voo (0.05)
396	O Afonso nas aulas fazia sempre muitas	perguntas (0.48)	asneiras (0.14) cábulas (0.10) actividades (0.05) atrocidades (0.05) notas (0.05) palermice (0.05) queixas (0.05) tralfulhices (0.05)
397	O Ernesto tem centenas de macieiras no seu	quintal (0.47)	jardim (0.37) pomar (0.16)
398	O Vítor no jogo de futebol com os amigos magoou-se no	joelho (0.47)	pé (0.26) tornozelo (0.11) braço (0.05) ombro (0.05) pulso (0.05)
399	O António começou a ir ao ginásio para perder a	gordura (0.47)	barriga (0.35) banha (0.18)
400	A Carla bebeu o café com	açúcar (0.46)	leite (0.36) natas (0.07) ela (0.04) ele (0.04) gosto (0.04)
401	A Maria estava contente por ter entrado naquela	faculdade (0.46)	casa (0.15) turma (0.15) escola (0.08) fase (0.08) viagem (0.08)
402	O André queria andar na pista de gelo mas não havia mais	patins (0.46)	bilhetes (0.08) botas (0.08) dinheiro (0.08) espaço (0.08) gelo (0.08) ninguém (0.08) sapatos (0.08)
403	O Rafael estava contente por ter ganho aquele	prémio (0.46)	concurso (0.15) amigo (0.08) debate (0.08) jogo (0.08) presente (0.08) torneio (0.08)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
404	O Ricardo deu-lhe um beijo na	boca (0.46)	cara (0.23) testa (0.23) bochecha (0.08)
405	O Rodrigo estacionou o carro na	garagem (0.46)	passadeira (0.15) rua (0.15) entrada (0.08) estrada (0.08) valeta (0.08)
406	O Gustavo foi buscar o seu carro à	garagem (0.46)	oficina (0.46) estação (0.04) inspeção (0.04)
407	O pai disse-lhe para falar mais	alto (0.46)	baixo (0.38) depressa (0.08) rápido (0.04) vezes (0.04)
408	A menina tinha medo de ir falar com aquele	rapaz (0.45)	senhor (0.18) homem (0.18) gajo (0.09) menino (0.09)
409	A professora disse-lhes para irem limpar as	mesas (0.45)	mãos (0.09) salas (0.09) bancadas (0.05) calças (0.05) cadeiras (0.05) escadas (0.05) estantes (0.05) janelas (0.05) ruas (0.05) unhas (0.05)
410	A Teresa só viu que havia greve quando chegou ao	metro (0.45)	trabalho (0.36) comboio (0.09) local (0.09)
411	Nessa manhã estava tanto frio que teve de usar umas	meias (0.45)	luvas (0.32) collants (0.14) botas (0.05) sandálias (0.05)
412	O Filipe teve de esperar uns minutos pelo próximo	comboio (0.45)	autocarro (0.32) metro (0.14) cliente (0.05) discurso (0.05)
413	O Gabriel guardou as notas no	bolso (0.45)	quarto (0.14) computador (0.09) caderno (0.09) telemóvel (0.05) mealheiro (0.05) livro (0.05) cofre (0.05) banco (0.05)
414	O menino a brincar rasgou as	calças (0.45)	mãos (0.05) meias (0.05)
415	O Pedro teve de ser operado ao	coração (0.45)	apêndice (0.09) cérebro (0.09) intestino (0.09) nariz (0.09) ombro (0.09) rim (0.09)
416	Quando está sozinha a Leonor costuma comer no	quarto (0.45)	bar (0.09) restaurante (0.09) terraço (0.09) refeitório (0.09) chão (0.05) parque (0.05) pátio (0.05) tabuleiro (0.05)
417	A Vanessa quando lavava o chão entornou o	balde (0.45)	café (0.15) sumo (0.15) brinco (0.05) chá (0.05) detergente (0.05) líquido (0.05) vinho (0.05)
418	Ele abriu a janela de manhã e viu que estava muito	frio (0.45)	nevoeiro (0.15) sol (0.15) nublado (0.15) calor (0.05) vento (0.05)
419	O jardineiro antes de ir para o jardim calçou umas	botas (0.45)	luvas (0.4) jardineiras (0.05) meias (0.05) sandálias (0.05)
420	O Mariano levou uma caixa de bombons para oferecer à sua	namorada (0.45)	mãe (0.2) amiga (0.15) professora (0.1) avó (0.05) tia (0.05)
421	O turista achou que era muito perigoso andar naquela	rua (0.45)	estrada (0.25) zona (0.15) bicicleta (0.05) floresta (0.05) praia (0.05)
422	As frutas do avô são tão boas porque vêm do seu	quintal (0.45)	pomar (0.38) jardim (0.14) terreno (0.03)
423	A cicatriz o João prolongava-se até ao	joelho (0.44)	pescoço (0.44) cotovelo (0.11) verão (0.11)
424	A menina não conseguia abrir aquela	janela (0.44)	porta (0.33) caixa (0.11) mala (0.11)
425	Para ajudar a combater o incêndio os bombeiros chamaram um	avião (0.44)	bombeiro (0.22) helicóptero (0.22) camião (0.11)
426	Quando chegou ao quarto a Cristina ligou o	computador (0.4375)	telemóvel (0.19) candeeiro (0.13) rádio (0.13) aquecedor (0.06) ar condicionado (0.06)
427	A Bruna foi à aldeia visitar a sua querida	avó (0.43)	amiga (0.30) tia (0.13) irmã (0.09) prima (0.04)
428	A Carlota queria viajar e conhecer novas	pessoas (0.43)	culturas (0.26) cidades (0.13) terras (0.09) civilizações (0.04) ruas (0.04)
429	A mãe pediu-lhe ajuda para levar até ao carro os	sacos (0.43)	livros (0.22) brinquedos (0.13) alimentos (0.04) objectos (0.04) recados (0.04) mecânicos (0.04) garrações (0.04)
430	As visitas foram ver o bebé que estava a dormir no	berço (0.43)	quarto (0.30) sofá (0.17) colo (0.04) hospital (0.04)

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431	Como estava a chover o Carlos foi buscar as suas	botas (0.43)	coisas (0.13) irmãs (0.13) galochas (0.09) malas (0.09) chaves (0.04) gabardines (0.04) roupas (0.04)
432	Como trabalho de casa a professora pediu para acabarem aquele	texto (0.43)	exercício (0.39) artigo (0.04) ficha (0.04) resumo (0.04) TPC (0.04)
433	O Guilherme ia sempre a todas as	aulas (0.43)	festas (0.30) actividade (0.04) competições (0.04) festas (0.04) manhãs (0.04) praias (0.04) quintas (0.04) semanas (0.04)
434	O João era muito traquina e estava sempre metido em	sarilhos (0.43)	problemas (0.26) confusões (0.22) traquinices (0.04) asneiras (0.04)
435	O Simão chegou atrasado à faculdade porque perdeu o	autocarro (0.43)	comboio (0.43) metro (0.13)
436	O avô foi buscar uma alface ao	quintal (0.43)	jardim (0.29) supermercado (0.14) cesto (0.05) mercado (0.05) quarto (0.05)
437	A câmara municipal convidou várias bandas para tocarem no	concerto (0.43)	festival (0.19) evento (0.10) baile (0.05) coliseu (0.05) coreto (0.05) município (0.05) parque (0.05) teatro (0.05)
438	A Inês ofereceu um relógio ao seu	pai (0.43)	namorado (0.38) avô (0.10) amigo (0.05) irmão (0.05)
439	A noiva não gostou muito daquele	vestido (0.43)	anel (0.10) bolo (0.05) comentário (0.05) comportamento (0.05) convidado (0.05) gesto (0.05) noivo (0.05) notícia (0.05) padrinho (0.05) presente (0.05) rapaz (0.05)
440	O alpinista foi resgatado de	avião (0.43)	helicóptero (0.29) avalanche (0.14) barco (0.14)
441	O Filipe esqueceu-se de levar para o teste a	caneta (0.43)	calculadora (0.19) escola (0.10) mãe (0.10) aula (0.05) ficha (0.05) lapiseira (0.05) tempo (0.05)
442	O Santiago todas as manhãs vai correr para o	parque (0.43)	jardim (0.21) autocarro (0.07) colégio (0.07) ginásio (0.07) polo (0.07) paredão (0.07)
443	Para sair da ilha tiveram de construir uma	jangada (0.42)	ponte (0.21) barca (0.11) canoa (0.11) barraca (0.05) carruagem (0.05) embarcação (0.05)
444	O Guilherme cortou-se ao fazer a	barba (0.42)	sopa (0.17) comida (0.17) pizza (0.08) salada (0.08) carta (0.08)
445	O Manuel vê sempre os jogos de futebol no	computador (0.42)	café (0.29) estádio (0.17) televisor (0.08) quarto (0.04)
446	A Beatriz decidiu ir ver a exposição da famosa	artista (0.41)	pintora (0.29) fotografa (0.18) cantora (0.06) Alexandria (0.06) Lisboa (0.06)
447	As mulheres muçulmanas usam sempre um	lenço (0.41)	véu (0.29) turbante (0.12) burca (0.06) chapéu (0.06) hijab (0.06)
448	A mãe pediu-lhe para colocar a roupa suja no	cesto (0.41)	balde (0.14) lixo (0.14) saco (0.14) armário (0.05) bacio (0.05) canto (0.05) chão (0.05)
449	A Marisa teve de voltar a casa porque rompeu as	calças (0.41)	meias (0.41) águas (0.09) collants (0.05) cuecas (0.05)
450	A Rita gosta de todas as bandas que vão tocar naquele	festival (0.41)	concerto (0.41) dia (0.14) baile (0.05)
451	A avó abriu a caixa de chocolates e disse-lhe para tirar um	bombom (0.4)	quadrado (0.2) bocado (0.1) chocolate (0.1) pequeno (0.1) pouco (0.1)
452	A família da Sara almoça sempre na	cantina (0.4)	sala (0.3) cozinha (0.15) Ericeira (0.05) rua (0.05) taberna (0.05)
453	A Madalena acordou a meio da noite por causa dos	pesadelos (0.4)	barulhos (0.3) cães (0.1) sons (0.1) vizinhos (0.1)
454	A Maria só gosta do bacalhau daquele	restaurante (0.4)	salgado (0.2) mercado (0.1) senhor (0.1) sítio (0.1) tipo (0.1)
455	A Teresa estava a comer o pudim com uma colher de	sopa (0.4)	pau (0.25) plástico (0.15) sobremesa (0.15) chá (0.05)
456	O aluno avisou que iria terminar mais cedo a	tarefa (0.4)	aula (0.35) prova (0.15) apresentação (0.1)

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457	O António decidiu experimentar as suas novas	botas (0.4)	calças (0.2) sapatilhas (0.2) camisolas (0.1) luvas (0.1)
458	O António estava distraído e entornou o	copo (0.4)	leite (0.3) café (0.3)
459	O Carlos comeu tudo só deixou no prato um pouco de	arroz (0.4)	carne (0.15) ervilhas (0.1) massa (0.1) migalhas (0.05) pão (0.05) pato (0.05) pizza (0.05) salada (0.05)
460	O jornalista comunicou o desaparecimento do barco e de um	homem (0.4)	aluno (0.1) amigo (0.1) avião (0.1) marinheiro (0.1) passageiro (0.1) pescador (0.1)
461	O maestro corrigiu o músico que estava a tocar o	piano (0.4)	saxofone (0.2) violino (0.2) instrumento (0.1) trombone (0.1)
462	O Marco foi buscar a roupa que tinha deixado na	lavandaria (0.4)	varanda (0.15) escola (0.1) cama (0.05) cantina (0.05) casa-de-banho (0.05) corda (0.05) entrada (0.05) rua (0.05) sala (0.05)
463	O menino andou duas semanas com uma tala por ter partido um	braço (0.4)	dedo (0.35) pé (0.15) osso (0.05) pulso (0.05)
464	O Paulo foi jantar com os antigos colegas de	trabalho (0.4)	curso (0.15) casa (0.1) turma (0.1) faculdade (0.05) ginásio (0.05) liceu (0.05) praxe (0.05) quarto (0.05)
465	O placard do aeroporto anunciava um atraso no	voo (0.4)	avião (0.4) horário (0.1) écran (0.05) trajecto (0.05)
466	O Tomé levou o cão a passear naquele	jardim (0.4)	día (0.3) parque (0.3)
467	A estrada foi cortada por causa do	trânsito (0.39)	acidente (0.35) tempo (0.17) temporal (0.04) terramoto (0.04)
468	A Maria foi apontar tudo na	agenda (0.39)	folha (0.22) mesa (0.17) caderneta (0.13) mão (0.04) sala (0.04)
469	A Mariana estava a escrever no seu	diário (0.39)	caderno (0.26) computador (0.22) telemóvel (0.09) twitter (0.04)
470	A Rute queixava-se que nunca encontra nada na sua	mala (0.39)	casa (0.26) carteira (0.13) gaveta (0.09) aldeia (0.04) rua (0.04) vida (0.04)
471	O João estava tão cansado que adormeceu no	sofá (0.39)	carro (0.22) comboio (0.17) chão (0.09) autocarro (0.04) café (0.04) quarto (0.04)
472	O pai quando cozinha usa sempre aquela	panela (0.39)	faca (0.17) frigideira (0.09) espátula (0.09) roupa (0.09) camisa (0.04) colher (0.04) especiaria (0.04) massa (0.04)
473	O piloto avisou os passageiros que ia iniciar a	viagem (0.39)	descolagem (0.39) descida (0.09) subida (0.04) trajetória (0.04) aterragem (0.04)
474	Os avós todos os domingos davam um	almoço (0.39)	passeio (0.26) jantar (0.13) beijo (0.09) bolo (0.04) concerto (0.04) presente (0.04)
475	A estação de televisão enviou para a Síria um	repórter (0.39)	jornalista (0.22) aviso (0.11) recado (0.11) comentador (0.06) documento (0.06) satélite (0.06)
476	A Helena foi buscar algumas frutas frescas ao	supermercado (0.39)	mercado (0.28) frigorífico (0.11) jardim (0.11) bosque (0.06) pomar (0.06)
477	O Mário guardou as moedas que recebeu no	bolso (0.39)	natal (0.28) mealheiro (0.17) aniversário (0.06) café (0.06) metro (0.06)
478	A avó estava a aquecer a comida naquela	panela (0.38)	noite (0.15) tarde (0.15) fogão (0.08) hora (0.08) tijela (0.08) zona (0.08)
479	A Filipa não gosta de chinelos prefere usar as suas	pantufas (0.38)	botas (0.31) sandálias (0.23) sapatilhas (0.08)
480	A mãe proibiu a menina de comer as	batatas (0.38)	bolachas (0.23) gomas (0.15) laranjas (0.08) maçãs (0.08) pipocas (0.08)
481	A Maria todos os sábados vai dançar para aquela	discoteca (0.38)	academia (0.08) aula (0.08) casa (0.08) dança (0.08) escola (0.08) festa (0.08) praça (0.08) praia (0.08)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
482	A Sara vestiu o seu pijama quentinho e calçou umas	pantufas (0.38)	meias (0.38) botas (0.08) camisolas (0.08) luvas (0.08)
483	No natal a avó recebe sempre uma caixinha de	chocolates (0.38)	bombons (0.15) doces (0.15) bolos (0.08) charutos (0.08) gomas (0.08) prenda (0.08)
484	O César arrumou todos os livros do ano anterior no	armário (0.38)	caçifo (0.23) sótão (0.23) caixote (0.08) estante (0.08)
485	O polícia disse-lhes que iam começar uma caça ao	ladrão (0.38)	homem (0.23) tesouro (0.15) bairro (0.08) criminoso (0.08) ganso (0.08)
486	O Tomé foi passear com a namorada para o	jardim (0.38)	rio (0.15) centro (0.08) céu (0.08) parque (0.08) pátio (0.08) Tejo (0.08) Terreiro (0.08)
487	A menina não vai ao parque porque tem medo dos	cães (0.38)	pássaros (0.10) patos (0.10) pombos (0.10) baloiços (0.05) bichos (0.05) ladrões (0.05) meninos (0.05) outros (0.05) palhaços (0.05) rufias (0.05)
488	O Bernardo convidou-a para ir ao	cinema (0.38)	baile (0.10) café (0.10) festival (0.10) bar (0.05) espectáculo (0.05) evento (0.05) museu (0.05) restaurante (0.05) supermercado (0.05) teatro (0.05)
489	O trolha despejou rapidamente toda a massa do	cimento (0.38)	almoço (0.25) barco (0.13) contentor (0.13) prato (0.13)
490	A Daniela não conseguia estudar porque estava cheia de	dores (0.37)	sono (0.32) fome (0.11) cólicas (0.05) distrações (0.05) febre (0.05) medo (0.05)
491	A Filipa não conseguiu ir trabalhar porque estava cheia de	dores (0.37)	sono (0.26) febre (0.11) diarreia (0.05) fome (0.05) frio (0.05) nervos (0.05) pressa (0.05)
492	A Júlia assustou-se tanto que deu um	grito (0.37)	salto (0.32) pulo (0.21) encontrão (0.05) pum (0.05)
493	O Luís quando cozinha usa sempre aquele	avental (0.37)	tacho (0.32) arroz (0.05) condimento (0.05) garfo (0.05) método (0.05) recheio (0.05) utensílio (0.05)
494	Por causa da inundação tiveram de cortar a	luz (0.37)	água (0.26) electricidade (0.21) árvore (0.11) estrada (0.05)
495	A última pergunta do teste pedia para escreverem uma	composição (0.36)	frase (0.23) palavra (0.14) resposta (0.09) redação (0.09) espera (0.05) tese (0.05)
496	Estava tão pouco inspirado que só conseguiu escrever uma	frase (0.36)	palavras (0.36) carta (0.09) composição (0.09) música (0.09)
497	No batizado os padrinhos ofereceram uma pulseira de	ouro (0.36)	batismo (0.36) casamento (0.09) diamantes (0.09) pérolas (0.09)
498	O Gonçalo decidiu comprar uma nova	bicicleta (0.36)	televisão (0.18) blusa (0.09) camisola (0.09) carteira (0.09) peça (0.09) viola (0.09)
499	O menino não tinha muita fome por isso lanchou só um	iogurte (0.36)	pão (0.18) bolo (0.09) café (0.09) folhado (0.09) hambúrguer (0.09) sumo (0.09)
500	A mãe pediu ao Tomás para arrumar a	casa (0.36)	sala (0.29) cozinha (0.21) cama (0.07) mesa (0.07)
501	A igreja já estava preparada para a	cerimónia (0.35)	missa (0.29) festa (0.24) eucaristia (0.06) ocasião (0.06)
502	A mãe pediu-lhe para arrumar os seus	brinquedos (0.35)	livros (0.29) sapatos (0.18) pertences (0.12) pratos (0.06)
503	Os pais decidiram inscrever os filhos no	colégio (0.35)	ginásio (0.35) karaté (0.12) ATL (0.06) clube (0.06) concurso (0.06)
504	Os pais decidiram que naquele passeio iriam visitar um	museu (0.35)	amigo (0.29) monumento (0.18) familiar (0.06) palácio (0.06) zoo (0.06)
505	Quando foi trabalhar a mãe deixou o bebé na	creche (0.35)	escola (0.18) ama (0.18) avó (0.12) secretária (0.06) sala (0.06) cama (0.06)
506	A Mafalda estava nervosa porque tinha de fazer uma apresentação na	aula (0.35)	escola (0.2) quarta (0.1) quinta (0.1) segunda (0.1) sexta (0.1) sala (0.05)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
507	O pior naquele prédio era ter tantas	escadas (0.35)	janelas (0.3) pessoas (0.2) aranhas (0.05) bandas (0.05) fugas (0.05)
508	Os alunos pediram ao professor para não marcar mais	testes (0.35)	faltas (0.3) trabalhos (0.25) exames (0.1)
509	A Soraia nem acredita que conseguiu um autógrafo daquele	cantor (0.35)	actor (0.30) artista (0.13) famoso (0.09) atleta (0.04) herói (0.04) autor (0.04)
510	As crianças estavam a brincar à apanhada no	jardim (0.35)	recreio (0.26) parque (0.13) pátio (0.09) quintal (0.09) intervalo (0.04) orfanato (0.04)
511	Os ladrões pensavam que aquela casa não tinha	alarme (0.35)	pessoas (0.22) ninguém (0.13) nada (0.13) gente (0.04) porta (0.04) valor (0.04) ouro (0.04)
512	A Elsa ainda não conseguiu agendar a	reunião (0.33)	consulta (0.11) depilação (0.11) investigação (0.11) tarefa (0.11) vida (0.11) visita (0.11)
513	A mãe pediu-lhe para ir buscar pão à	padaria (0.33)	loja (0.28) mercearia (0.28) cozinha (0.06) pastelaria (0.06)
514	A Manuela comprou novos cadernos para as suas	aulas (0.33)	disciplinas (0.14) amigas (0.14) filhas (0.14) cadeiras (0.05) colecções (0.05) ideias (0.05) notas (0.05) receitas (0.05)
515	A menina ao fazer o desenho pintou também um	dedo (0.33)	sol (0.22) girassol (0.11) livro (0.11) pássaro (0.11) pinto (0.11)
516	Ele é muito introvertido e não gosta de ir a	festas (0.33)	escolas (0.33) concertos (0.11) discotecas (0.11) praia (0.11)
517	Na festa de aniversário o menino comeu muitas	gomas (0.33)	guloseimas (0.33) bolachas (0.06) fatias (0.06) pipocas (0.06) porcarias (0.06) sandwiches (0.06) tortas (0.06)
518	No Natal a avó deu-lhe uma caixa de	chocolates (0.33)	bombons (0.29) biscoitos (0.05) brinquedo (0.05) lápis (0.05) meias (0.05) música (0.05) preservativos (0.05) rebuçados (0.05) sapatos (0.05)
519	O César arrumou os livros do ano anterior no	armário (0.33)	quarto (0.25) sótão (0.25) baú (0.04) cacifo (0.04) caixote (0.04) lixo (0.04)
520	O chefe chamou-o ao final do dia para anunciar a sua	promoção (0.33)	demissão (0.28) decisão (0.06) despedida (0.06) invenção (0.06) nomeação (0.06) partida (0.06) saída (0.06) vitória (0.06)
521	O Júlio estava a dar comida aos	pássaros (0.33)	cães (0.22) pombos (0.11) gatos (0.11) filhos (0.06) peixes (0.06) pobres (0.06) porcos (0.06)
522	O músico sabe tocar contrabaixo e também	guitarra (0.33)	violino (0.17) piano (0.17) bateria (0.08) clarinete (0.08) saxofone (0.08) violoncelo (0.08)
523	O Paulo costuma almoçar no	refeitório (0.33)	restaurante (0.28) bar (0.17) café (0.06) Colombo (0.06) jardim (0.06) parque (0.06)
524	Os filmes preferidos da Amélia são os	românticos (0.33)	clássicos (0.13) animados (0.07) antigos (0.07) assustadores (0.07) cómicos (0.07) franceses (0.07) jogos (0.07) melhores (0.07) romances (0.07)
525	Os índios atravessaram o rio com a sua	canoa (0.33)	jangada (0.22) lancha (0.22) comunidade (0.11) família (0.11)
526	Todos os anos os escuteiros organizavam um	acampamento (0.33)	evento (0.28) passeio (0.17) arraial (0.11) convívio (0.06) piquenique (0.06)
527	Todos os dias ao jantar o António vê as	notícias (0.33)	novelas (0.11) primas (0.11) amigas (0.06) cartas (0.06) estrelas (0.06) familiares (0.06) netas (0.06) flores (0.06) tias (0.06) séries (0.06)
528	Na viagem à Tunísia andou pela primeira vez num	camelo (0.32)	barco (0.32) avião (0.27) elefante (0.05) tuc-tuc (0.05)
529	A garagem era tão pequena que só cabia uma	mota (0.32)	pessoa (0.32) bicicleta (0.16) camioneta (0.05) carrinha (0.05) formiga (0.05) mala (0.05)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
530	A Raquel queria aproveitar a viagem para conhecer aquelas	peessoas (0.32)	raparigas (0.26) paisagens (0.16) cidades (0.11) amigas (0.05) ilhas (0.05) padarias (0.05)
531	Quando chegou à estação viu que tinha perdido o	comboio (0.32)	passé (0.21) telemóvel (0.16) bilhete (0.16) cartão (0.11) sapato (0.05)
532	A Beatriz todas as semanas compra uma	camisola (0.31)	revista (0.19) mala (0.13) alface (0.06) banana (0.06) bolacha (0.06) borracha (0.06) camisa (0.06) roupa (0.06)
533	O atleta estava furioso porque tinham perdido o	jogo (0.31)	campeonato (0.31) combate (0.13) adversário (0.06) prémio (0.06) treino (0.06) concurso (0.06)
534	A Maria colocou as novas molduras naquela	parede (0.31)	prateleira (0.23) mesa (0.23) estátua (0.08) fotografia (0.08) sala (0.08)
535	A Teresa não tem carro por isso anda sempre de	autocarro (0.31)	bicicleta (0.31) metro (0.15) mota (0.08) comboio (0.08) transporte (0.08)
536	O avô sempre disse que não queria ir viver num	lar (0.31)	apartamento (0.23) prédio (0.15) barco (0.15) campo (0.08) sítio (0.08)
537	O Luís estava em casa à espera que entregassem as	pizzas (0.31)	compras (0.15) encomendas (0.15) cartas (0.08) chaves (0.08) flores (0.08) fotocópias (0.08) prateleira (0.08)
538	Quando olhou para a praia viu um conjunto de	peessoas (0.31)	gaivotas (0.23) peixes (0.15) bolas (0.08) conchas (0.08) toalhas (0.08) pombos (0.08)
539	Todas as noites a Mariana vê as	novelas (0.30)	estrelas (0.26) notícias (0.22) andorinhas (0.04) contas (0.04) filhas (0.04) horas (0.04) séries (0.04)
540	A banda de música pop adorou tocar naquele	bar (0.3)	concerto (0.2) lugar (0.15) sítio (0.1) dia (0.05) festival (0.05) país (0.05) pavilhão (0.05) verão (0.05)
541	A mãe disse-lhe para estender a roupa na	varanda (0.3)	cozinha (0.3) rua (0.2) corda (0.1) marquise (0.1)
542	A menina não gostou muito de receber aquele	presente (0.3)	cartão (0.2) convite (0.1) elogio (0.1) nove (0.1) postal (0.1) telefonema (0.1)
543	A Mónica não conseguia colocar mais plantas na sua	varanda (0.3)	casa (0.3) cozinha (0.05) escadaria (0.05) estufa (0.05) janela (0.05) jarra (0.05) marquise (0.05) quinta (0.05) sala (0.05)
544	O Afonso dava-se bem com os seus colegas de	escola (0.3)	turma (0.3) carteira (0.1) casa (0.1) ciências (0.1) trabalho (0.1)
545	O alpinista teve de ser resgatado de	emergência (0.3)	helicóptero (0.2) imediato (0.2) urgência (0.2) avião (0.1)
546	O avô do Rui já vivia há muito tempo naquele	lugar (0.3)	apartamento (0.2) curral (0.1) jardim (0.1) lar (0.1) local (0.1) prédio (0.1)
547	O avô usa sempre em cima do pijama um	robe (0.3)	casaco (0.3) cobertor (0.2) roupão (0.2)
548	O Duarte foi o primeiro a entrar no recinto do	colégio (0.3)	jogo (0.3) concerto (0.2) festival (0.1) parque (0.1)
549	O Frederico colocou o pão que tinha acabado de comprar no	cesto (0.3)	saco (0.3) bolso (0.2) café (0.1) mercado (0.1)
550	O Gustavo comprou um brinquedo para a sua	irmã (0.3)	amiga (0.2) filha (0.2) namorada (0.1) prima (0.1) sobrinha (0.1)
551	O menino disse à mãe que lhe doía a	cabeça (0.3)	mão (0.3) perna (0.2) barriga (0.2)
552	O Tiago não gostava daquela praia por causa das	peessoas (0.3)	rochas (0.3) água (0.1) algas (0.1) moscas (0.1) ondas (0.1)
553	O Vítor traz sempre peixe fresco para casa por ser	pescador (0.3)	peixeiro (0.2) melhor (0.2) fresco (0.1) vegetariano (0.1) vivo (0.1)
554	O André comprou uma máquina nova para o curso de	fotografia (0.29)	psicologia (0.18) informática (0.12) álgebra (0.06) engenharia (0.06) pintura (0.06) gestão (0.06) estatística (0.06) medicina (0.06) matemática (0.06)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
555	O avô andava sempre no bolso com muitas	notas (0.29)	moedas (0.29) chaves (0.12) guloseimas (0.12) caricas (0.06) coisas (0.06) pastilhas (0.06)
556	O Miguel andava a treinar para participar naquela	competição (0.29)	corrida (0.24) maratona (0.18) prova (0.12) equipa (0.06) gincana (0.06) audiência (0.06)
557	O presidente pediu ajuda para preparar o	discurso (0.29)	evento (0.18) congresso (0.12) orçamento (0.12) jantar (0.12) debate (0.06) diploma (0.06) festival (0.06)
558	Depois de cozinhar o Fernando reparou que tinha sujado o	avental (0.29)	fogão (0.21) chão (0.14) casaco (0.14) tapete (0.14) balcão (0.07)
559	Os escuteiros estavam a organizar mais um	evento (0.29)	encontro (0.21) acampamento (0.14) passeio (0.14) baile (0.07) concurso (0.07) jogo (0.07)
560	Quando chegou ao aeroporto reparou que se tinha esquecido do	passaporte (0.29)	casaco (0.21) chapéu (0.11) bilhete (0.11) telemóvel (0.07) bilhete de identidade (0.04) cartão (0.04) carro (0.04) livro (0.04) relógio (0.04) saco (0.04)
561	A Maria só passou à segunda no exame de	condução (0.28)	código (0.22) história (0.22) matemática (0.11) inglês (0.06) português (0.06) química (0.06)
562	A Raquel queria vestir a sua nova	camisola (0.28)	roupa (0.28) blusa (0.17) camisa (0.11) saia (0.11) cadela (0.06)
563	O aluno estava confiante que ia conseguir fazer todas as	perguntas (0.28)	provas (0.22) cadeiras (0.17) respostas (0.17) tarefas (0.11) frases (0.06)
564	O professor pediu-lhe para reescrever a	frase (0.28)	composição (0.28) tese (0.17) carta (0.11) história (0.06) prova (0.06) resposta (0.06)
565	Para resolver o exercício o Afonso pediu ajuda ao	pai (0.28)	professor (0.17) colega (0.17) amigo (0.11) avô (0.06) Frederico (0.06) Pedro (0.06) tio (0.06) primo (0.06)
566	A avó moeu os grãos de café e colocou-os na	máquina (0.27)	cafeteira (0.27) caneca (0.09) chávena (0.09) jarra (0.09) sopa (0.09) tigela (0.09)
567	O menino pediu de presente de aniversário um	carro (0.27)	avião (0.18) boneco (0.09) brinquedo (0.09) cão (0.09) chocolate (0.09) computador (0.09) jogo (0.09)
568	O Rodrigo deixou o carro na	garagem (0.27)	rua (0.27) estação (0.09) estrada (0.09) oficina (0.09) praia (0.09) sarjeta (0.09)
569	O Fernando quando cozinha suja sempre muito o	balcão (0.27)	fogão (0.2) prato (0.13) tacho (0.13) chão (0.13) avental (0.07) garfo (0.07)
570	A Maria não podia entrar porque não tinha	idade (0.26)	passé (0.16) dinheiro (0.16) cartão (0.11) chave (0.11) autorização (0.05) média (0.05) roupa (0.05) coragem (0.05)
571	A professora de geografia pediu para escreverem um trabalho sobre aquelas	montanhas (0.26)	cidades (0.21) ilhas (0.16) aldeias (0.05) aulas (0.05) experiências (0.05) flores (0.05) pedras (0.05) regiões (0.05) revistas (0.05)
572	O Fernando foi estudar para a	biblioteca (0.26)	faculdade (0.16) sala (0.16) escola (0.11) Alemanha (0.05) América (0.05) cozinha (0.05) praia (0.05) universidade (0.05)
573	Quando abriu a mochila viu que se tinha esquecido do	caderno (0.26)	estojo (0.16) telemóvel (0.16) lápis (0.11) livro (0.11) computador (0.11) cartão (0.05) passe (0.05)
574	A mãe do Hugo não gostava que ele andasse de	mota (0.25)	bicicleta (0.13) gatas (0.13) metro (0.13) calções (0.06) camisa (0.06) carro (0.06) chapéu (0.06) skate (0.06) tutu (0.06)
575	O Duarte queria ir a todos os concertos daquele	cantor (0.25)	festival (0.2) grupo (0.15) artista (0.1) verão (0.1) dia (0.1) ano (0.05) mês (0.05)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
576	O Rafael deu um pouco mais de água aos	cães (0.25)	amigos (0.15) gatos (0.15) pobres (0.1) animais (0.05) cavalos (0.05) filhos (0.05) jogadores (0.05) meninos (0.05) patos (0.05) peixes (0.05)
577	Os alpinistas foram resgatados por um	helicóptero (0.25)	bombeiro (0.2) homem (0.15) avião (0.1) cão (0.1) civil (0.05) eremita (0.05) pescador (0.05) salvador (0.05)
578	A Gabriela esteve horas a esfregar o	chão (0.24)	cabelo (0.24) olho (0.19) cão (0.05) carro (0.05) gato (0.05) grelhador (0.05) nariz (0.05) pulso (0.05) tapete (0.05)
579	O Bernardo foi buscar uns alperces à	árvore (0.24)	mercearia (0.24) quinta (0.18) frutaria (0.12) vizinha (0.12) fazenda (0.06) garagem (0.06)
580	O Hugo chegou atrasado por causa do	autocarro (0.24)	trânsito (0.24) comboio (0.12) tempo (0.12) pai (0.12) despertador (0.06) metro (0.06) temporal (0.06)
581	Os alunos costumam jogar à bola no	pátio (0.24)	quintal (0.24) campo (0.18) parque (0.18) intervalo (0.06) recreio (0.06) terraço (0.06)
582	A avó levou para o hospital um pijama e um	roupão (0.23)	chinelos (0.23) livro (0.15) cobertor (0.08) edredão (0.08) saco (0.08) tablet (0.08) travesseiro (0.08)
583	A mãe dava sempre o leite ao filho naquele	copo (0.23)	dia (0.23) momento (0.15) biberão (0.08) horário (0.08) jardim (0.08) metro (0.08) sítio (0.08)
584	A avó deu à Filomena um lindo par de	botas (0.22)	brincos (0.22) sapatos (0.17) meias (0.11) óculos (0.11) chinelos (0.06) luvas (0.06) patins (0.06)
585	Antes de começar a escola o Gonçalo pediu ao pai uma	mochila (0.22)	caneta (0.17) mota (0.17) ajuda (0.06) aula (0.06) bicicleta (0.06) calculadora (0.06) carta (0.06) consola (0.06) festa (0.06) moeda (0.06)
586	As vitaminas eram tão coloridas e viscosas que pareciam	gelatina (0.22)	doces (0.22) smarties (0.22) estranhas (0.11) gomas (0.11) lesmas (0.11)
587	Como estava de dieta não podia comer chocolates nem	gomas (0.22)	bolachas (0.11) bolos (0.11) bombons (0.11) doces (0.11) pão (0.11) pizza (0.11) salgados (0.11)
588	O António começou uma dieta porque está a ficar com	diabetes (0.22)	peso (0.22) fome (0.22) barriga (0.11) gordura (0.11) nojo (0.11)
589	O menino não queria ler aquele livro porque tinha muitas	dificuldades (0.22)	dúvidas (0.22) palavras (0.17) letras (0.11) páginas (0.11) folhas (0.06) histórias (0.06) mortes (0.06)
590	O Santiago adora ir correr para o	jardim (0.22)	parque (0.22) paredão (0.22) cais (0.06) campo (0.06) descampado (0.06) mar (0.06) passeio (0.06) quintal (0.06)
591	O menino tem medo de ir ao	dentista (0.21)	médico (0.21) cinema (0.14) circo (0.14) colégio (0.11) jardim (0.07) quadro (0.07) sótão (0.07)
592	Na cantina os alunos comiam sempre	sopa (0.21)	massa (0.11) bem (0.11) alface (0.05) arroz (0.05) carne (0.05) frango (0.05) juntos (0.05) pão (0.05) peixe (0.05) pescada (0.05) sentados (0.05) vegetais (0.05) vegetariano (0.05)
593	A mãe começou a dar o leite ao bebé no	quarto (0.2)	almoço (0.1) biberão (0.1) carro (0.1) colo (0.1) copo (0.1) hospital (0.1) jardim (0.1) sofá (0.1)
594	A mãe disse-lhe para comer mais	fruta (0.2)	bolo (0.1) chocolate (0.1) sopa (0.1) vegetais (0.1) arroz (0.05) brócolos (0.05) carne (0.05) comida (0.05) legumes (0.05) morangos (0.05) peixe (0.05) verduras (0.05)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
595	Os polícias na reunião com o presidente exigiram mais um	aumento (0.2)	ordenado (0.2) carro (0.1) membro (0.1) orçamento (0.1) polícia (0.1) recrutamento (0.1) tempo (0.1)
596	O Fábio todas as manhãs bebe café naquela	chávena (0.17)	cadeira (0.11) cafeteria (0.11) mesa (0.11) caneca (0.06) esplanada (0.06) esquina (0.06) loja (0.06) máquina (0.06) padaria (0.06) pastelaria (0.06) rua (0.06) tarde (0.06)
597	O José esperou horas na fila para conseguir comprar aquele	bilhete (0.17)	jogo (0.17) cd (0.17) chapéu (0.08) computador (0.08) disco (0.08) paté (0.08) relógio (0.08) telefone (0.08)
598	O médico disse ao José que ele tinha de fazer aquela	consulta (0.17)	análise (0.11) medicação (0.11) operação (0.11) radiografia (0.11) actividade (0.06) coisa (0.06) ecografia (0.06) prova (0.06) tarefa (0.06) terapia (0.06) visita (0.06)
599	O menino não conseguia ler as	palavras (0.5)	letras (0.21) frases (0.14) planilhas (0.07) respostas (0.07)
600	O avô costumava beber café com leite naquela	caneca (0.11)	casa (0.11) esplanada (0.11) pastelaria (0.11) varanda (0.11) cadeira (0.06) esquina (0.06) hora (0.06) manhã (0.06) mesa (0.06) padaria (0.06) sala (0.06) varanda (0.06)

Table 3

Sentence fragments of Experiment 2 listed in order of descending multiple cloze probability. The cloze probability value appears after each word in parenthesis. The column 'Other Responses' lists all other words used to complete the sentence fragments with their cloze probability in parenthesis.

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
1	A Daniela para proteger as mãos foi buscar umas	luvas (0.87)	toalhas (0.07) pás (0.07)
2	A educadora pediu-lhes para fazerem uma roda e darem as	mãos (0.83)	prendas (0.08) boas-vindas (0.08)
3	Para andar na pista de gelo tinha de saber andar de	patins (0.77)	esquis (0.15) trenó (0.08)
4	A avó estava a fazer a sopa numa grande	panela (0.77)	cozinha (0.08) sala (0.08) tijela (0.08)
5	O António nas férias deixou crescer a	barba (0.77)	perna (0.08) planta (0.08) preguiça (0.08)
6	A Joana está grávida e em breve vai notar-se a	barriga (0.77)	gravidez (0.12) fome (0.04) indisposição (0.04) saliência (0.04)
7	A Sara para proteger as mãos foi buscar umas	luvas (0.73)	garras (0.07) ligaduras (0.07) meias (0.07) toalhas (0.07)
8	Ele pegou na manteiga para barrar o	pão (0.71)	bolo (0.11) croissant (0.07) papo seco (0.04) scone (0.04) tabuleiro (0.04)
9	O Rafael estava tão cansado que mal conseguia subir as	escadas (0.71)	ruas (0.12) estradas (0.06) cadeiras (0.03) colinas (0.03) montanhas (0.03) rampas (0.03)
10	O piloto avisou que em breves minutos iria iniciar o	voo (0.70)	embarque (0.09) almoço (0.04) caminho (0.04) levantamento (0.04) motor (0.04) treino (0.04)
11	Ele usou o cachecol mas não estava assim tanto	frio (0.69)	vento (0.14) calor (0.10) gelo (0.03) orvalho (0.03)
12	Quando sai à noite a Joana vai sempre aquela	discoteca (0.67)	loja (0.17) camisola (0.08) esplanada (0.08)
13	A menina não conseguia tirar o anel do	dedo (0.67)	bolso (0.06) saco (0.06) buraco (0.03) cano (0.03) canto (0.03) carro (0.03) chão (0.03) lavatório (0.03) pau (0.03) pé (0.03)
14	Naquele dia o avião ia fazer o seu último	voo (0.66)	trajecto (0.14) percurso (0.09) caminho (0.06) pedido (0.03) pouso (0.03)
15	O menino ficou de castigo porque teve más	notas (0.66)	atitudes (0.17) amigas (0.03) avaliações (0.03) etiquetas (0.03) intenções (0.03) maneiras (0.03) reflexões (0.03)
16	O homem feriu a perna e teve de levar	pontos (0.63)	anestesia (0.13) injeções (0.13) gesso (0.06) penso (0.06)
17	O pai descobriu que a filha andava a faltar às	aulas (0.63)	consultas (0.09) explicações (0.09) reuniões (0.06) actividades (0.03) actuações (0.03) lições (0.03) sessões (0.03)
18	A criança ainda não sabia comer usando os	talheres (0.61)	pauzinhos (0.08) braços (0.06) dedos (0.06) dentes (0.06) garfos (0.06) bancos (0.03) pés (0.03) pratos (0.03)
19	O Paulo guardou os seus lápis num	estojo (0.61)	copo (0.09) saco (0.06) baú (0.03) bolso (0.03) buraco (0.03) caderno (0.03) caixote (0.03) casaco (0.03) frasco (0.03) gavetão (0.03)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
20	Antes da consulta o médico pediu-lhe para fazer novos	exames (0.61)	testes (0.24) pedidos (0.05) formulários (0.03) exercícios (0.03) movimento (0.03) registo (0.03)
21	O menino esteve a tarde toda a arrumar o seu	quarto (0.59)	armário (0.11) caderno (0.05) computador (0.05) roupeiro (0.05) dossiê (0.03) escritório (0.03) estudo (0.03) livro (0.03) mundo (0.03)
22	Como não queria estacionar na garagem deixou o carro na	rua (0.59)	berma (0.09) estrada (0.09) porta (0.06) avenida (0.03) curva (0.03) entrada (0.03) estação (0.03) praça (0.03) praceta (0.03)
23	O João foi provar aquele doce com pepitas de	chocolate (0.57)	caramelo (0.11) baunilha (0.06) cacau (0.06) açúcar (0.03) amêndoa (0.03) amendoim (0.03) arroz (0.03) bolacha (0.03) marshmallow (0.03) morango (0.03)
24	A Mariana foi fazer um piquenique e levou a comida num	cesto (0.56)	saco (0.18) balde (0.09) tupperware (0.09) carrinho (0.03) contentor (0.03) recipiente (0.03)
25	A Joana para cortar os legumes usou aquela	faca (0.56)	tábua (0.15) lâmina (0.09) ferramenta (0.03) catana (0.03) mão (0.03) máquina (0.03) mesa (0.03) navalha (0.03) unha (0.03)
26	A praia tinha chuveiros para as pessoas poderem tomar um	banho (0.56)	duche (0.42) refresco (0.03)
27	O Manuel usa sempre no seu braço direito um	relógio (0.56)	elástico (0.15) lenço (0.11) anel (0.04) bracelete (0.04) coração (0.04) objecto (0.04) Swatch (0.04)
28	O Afonso estava radiante por ter tido tão boas	notas (0.56)	amigas (0.08) avaliações (0.06) oportunidades (0.06) prendas (0.06) amigos (0.03) aventuras (0.03) classificações (0.03) colegas (0.03) marcas (0.03) observações (0.03) tias (0.03)
29	A mãe disse-lhe para levar um casaco porque estava	frio (0.55)	vento (0.10) chuva (0.07) doente (0.05) gelado (0.05) chovendo (0.02) chuvoso (0.02) feia (0.02) fresco (0.02) frio (0.02) humidade (0.02) nevando (0.02) ventoso (0.02)
30	O anel é muito caro porque tem um grande	diamante (0.54)	rubi (0.2) valor (0.14) brilhante (0.03) material (0.03) preço (0.03) significado (0.03)
31	Como as calças estavam largas teve de colocar um	cinto (0.54)	elástico (0.17) alfinete (0.09) botão (0.06) fecho (0.06) lenço (0.03) suspensório (0.03) sustentador (0.03)
32	Para chegar ao miradouro ainda tinham de subir muitas	escadas (0.54)	ruas (0.23) rampas (0.09) colinas (0.03) estradas (0.03) inclinações (0.03) montanhas (0.03) ruelas (0.03)
33	Como chegou tão sujo a casa foi logo para a	banheira (0.54)	casa-de-banho (0.26) cama (0.03) dispensa (0.03) mangueira (0.03) máquina (0.03) rua (0.03) sala (0.03) varanda (0.03)
34	Os pescadores estavam a lançar ao mar uma	rede (0.54)	cana (0.15) boia (0.07) sardinha (0.05) caixa (0.02) camisa (0.02) cria (0.02) isca (0.02) linha (0.02) pesca (0.02) presa (0.02) truta (0.02)
35	O pai encostou o carro na berma da	estrada (0.53)	rua (0.18) autoestrada (0.06) porta (0.06) via (0.18)
36	A Maria não conseguia abrir a porta porque não sabia da	chave (0.525)	fechadura (0.1) mala (0.08) senha (0.05) avó (0.03) caneta (0.03) carteira (0.03) chave (0.03) ficha (0.03) mãe (0.03) mão (0.03) pá (0.03) parede (0.03) técnica (0.03)
37	O avó esteve a cuidar das flores do seu	jardim (0.52)	quintal (0.29) neto (0.05) pátio (0.05) vaso (0.05) vizinho (0.05)
38	Na viagem a Maria pediu ajuda para carregar a	mala (0.52)	bagagem (0.07) bateria (0.07) bolsa (0.07) filha (0.05) mochila (0.05) bebé (0.02) câmara (0.02) carrinha (0.02) comida (0.02) criança (0.02) guitarra (0.02) prancha (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
39	Os naufragos para sair da ilha construíram uma	jangada (0.52)	canoa (0.16) ponte (0.12) avioneta (0.04) boia (0.04) cabana (0.04) caravana (0.04) nau (0.04)
40	O presidente esteve horas a preparar o	discurso (0.52)	almoço (0.08) jantar (0.08) banquete (0.04) comunicado (0.04) espaço (0.04) evento (0.04) plano (0.04) relato (0.04) salão (0.04) tratado (0.04)
41	O aluno fazia um desenho usando os coloridos	lápiz (0.51)	dedos (0.09) marcadores (0.09) pinceis (0.09) amarelos (0.03) azuis (0.03) cadernos (0.03) materiais (0.03) papéis (0.03) pensamentos (0.03) pinceis (0.03) verdes (0.03)
42	A empregada não conseguia entrar porque não tinha	chave (0.51)	autorização (0.08) coragem (0.05) vontade (0.05) acesso (0.03) campanha (0.03) código (0.03) espaço (0.03) força (0.03) inteligência (0.03) lugar (0.03) meios (0.03) ninguém (0.03) permissão (0.03) tempo (0.03)
43	Como ficou em segundo lugar também recebeu um	prémio (0.51)	chocolate (0.09) troféu (0.07) abraço (0.04) diploma (0.04) elogio (0.04) aplauso (0.02) bilhete (0.02) brinde (0.02) certificado (0.02) jogo (0.02) louvor (0.02) presente (0.02) telemóvel (0.02) valor (0.02)
44	A Filipa não conseguiu ligar porque tinha pouca	bateria (0.5)	rede (0.33) carga (0.06) conexão (0.06) disponibilidade (0.06)
45	Como estava tanto calor abriu a	janela (0.5)	porta (0.39) varanda (0.04) boca (0.02) camisa (0.02) capota (0.02)
46	O Afonso estava contente porque teve boas	notas (0.5)	amigas (0.14) amigos (0.09) médias (0.09) avaliações (0.05) férias (0.05) lembranças (0.05) notícias (0.05)
47	O Tomás disse que oferecia o lanche se ganhasse aquele	jogo (0.5)	prémio (0.13) cheque (0.06) concurso (0.06) debate (0.06) desempate (0.06) torneio (0.06) treino (0.06)
48	A Maria pendurou o quadro naquela	parede (0.5)	porta (0.18) casa (0.05) divisão (0.05) estante (0.05) mesa (0.05) montra (0.05) placa (0.05) sala (0.05)
49	A Tânia não conseguia ouvir bem a chamada porque tinha pouca	rede (0.5)	audição (0.21) bateria (0.09) internet (0.06) atenção (0.03) conexão (0.03) paciência (0.03) rede (0.03) sabedoria (0.03)
50	O avô amarrou a saca com aquela	corda (0.5)	fita (0.29) linha (0.05) amarra (0.03) camisola (0.03) mão (0.03) peça (0.03) roupa (0.03) vara (0.03)
51	A Fernanda esqueceu-se de trancar a	porta (0.5)	casa (0.13) janela (0.13) mala (0.06) fechadura (0.04) gaveta (0.04) caixa (0.02) cave (0.02) despensa (0.02) garagem (0.02) sala (0.02)
52	Os miúdos estavam contentes porque iam atravessar o rio num	barco (0.5)	avião (0.05) caiaque (0.1) iate (0.08) navio (0.08) bote (0.05) comboio (0.03) dia (0.03) Hippo (0.03) sítio (0.03) slide (0.03) teleférico (0.03)
53	O menino chegou atrasado à primeira	aula (0.5)	reunião (0.09) experiência (0.07) consulta (0.07) entrevista (0.04) sessão (0.04) vez (0.04) conferência (0.02) fase (0.02) festa (0.02) hora (0.02) lição (0.02) partida (0.02) prova (0.02)
54	A mãe pediu-lhe para ir comprar ovos ao	supermercado (0.5)	mercado (0.14) Continente (0.07) Modelo (0.05) amigo (0.02) bar (0.02) centro (0.02) indiano (0.02) Intermarché (0.02) Jumbo (0.02) madeirense (0.02) Minipreço (0.02) minimercado (0.02) Porto (0.02) vizinha (0.02)
55	O actor queria muito ficar com aquele	papel (0.49)	filme (0.08) trabalho (0.08) carro (0.06) prémio (0.04) ato (0.02) caracter (0.02) cenário (0.02) chocolate (0.02) dente (0.02) figurino (0.02) lugar (0.02) mérito (0.02) personagem (0.02) programa (0.02) ramo (0.02) texto (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
56	O menino ficou de castigo por ter dito muitas	asneiras (0.49)	besteiras (0.11) mentiras (0.08) faltas (0.05) parvoíces (0.05) palavras (0.05) alarvidades (0.03) barbaridades (0.03) burrices (0.03) estórias (0.03) estupidezes (0.03) gírias (0.03)
57	O Augusto depois do jantar fumou um	cigarro (0.48)	charuto (0.27) charro (0.13) cachimbo (0.08) maço (0.02) pouco (0.02)
58	O João foi a biblioteca consultar um	livro (0.48)	artigo (0.15) dicionário (0.08) manual (0.06) autor (0.02) caderno (0.02) colega (0.02) computador (0.02) documento (0.02) especialista (0.02) exemplar (0.02) jornal (0.02) panfleto (0.02) professor (0.02) relatório (0.02)
59	A Laura para perder peso iniciou uma nova	dieta (0.48)	alimentação (0.13) vida (0.13) rotina (0.07) actividade (0.04) aeróbica (0.02) corrida (0.02) estratégia (0.02) fase (0.02) ginástica (0.02) medida (0.02) rotina (0.02)
60	Quando acabou o secundário a Inês candidatou-se à	faculdade (0.48)	universidade (0.19) loja (0.14) empresa (0.10) igreja (0.05) Nike (0.05)
61	O Fernando não a deixou acabar de dizer a	frase (0.48)	palavra (0.21) citação (0.02) conclusão (0.02) declaração (0.02) história (0.02) ideia (0.02) justificação (0.02) letra (0.02) matéria (0.02) música (0.02) palestra (0.02) pergunta (0.02) piada (0.02) resposta (0.02)
62	O Fábio comprou uma nova secretária para pôr no	quarto (0.47)	escritório (0.37) trabalho (0.06) dormitório (0.04) anexo (0.02) emprego (0.02) hall (0.02)
63	O Gaspar era muito popular e ia sempre a todas as	festas (0.47)	aulas (0.16) reuniões (0.12) casas (0.04) saídas (0.04) actividades (0.02) competições (0.02) conferências (0.02) feiras (0.02) inaugurações (0.02) ocasiões (0.02) praxes (0.02) tabernas (0.02)
64	O médico pediu-lhe para fazer um	exame (0.47)	teste (0.19) diagnóstico (0.06) TAC (0.06) eletrocardiografia (0.04) raio-x (0.04) desenho (0.02) radiografia (0.02) regime (0.02) relatório (0.02) scan (0.02) trabalho (0.02)
65	O Leonel distraiu-se ao cozinhar e cortou o	dedo (0.47)	braço (0.14) pulso (0.12) pé (0.05) cabelo (0.02) coentro (0.02) dedo (0.02) joelho (0.02) legume (0.02) pão (0.02) peru (0.02) tabuleiro (0.02) tomate (0.02) umbigo (0.02)
66	O Jaime estava ansioso para que começassem as	aulas (0.46)	actividades (0.25) férias (0.17) experiências (0.04) práticas (0.04) teóricas (0.04)
67	Para atravessar o rio os escuteiros construíram uma	ponte (0.46)	jangada (0.31) passagem (0.06) avioneta (0.02) barcaça (0.02) barquilha (0.02) barragem (0.02) boia (0.02) cana (0.02) passadeira (0.02) plataforma (0.02)
68	O menino a brincar rasgou as	calças (0.46)	meias (0.22) botas (0.09) blusas (0.04) roupas (0.04) boxers (0.02) folhas (0.02) luvas (0.02) mãos (0.02) notas (0.02) papéis (0.02) pernas (0.02)
69	Antes de dormir a avó lia a	história (0.46)	revista (0.20) bíblia (0.11) carta (0.04) aventura (0.02) canção (0.02) cantiga (0.02) fábula (0.02) Francisca (0.02) oração (0.02) Manuel (0.02) neta (0.02) receita (0.02)
70	Os caloiros foram todos almoçar à cantina da	faculdade (0.45)	escola (0.23) universidade (0.27) cidade (0.05)
71	O Tiago mal chegou a casa tirou os	sapatos (0.45)	tênis (0.18) casacos (0.09) óculos (0.09) calções (0.07) auscultadores (0.02) chinelos (0.02) cigarros (0.02) dentes (0.02) fones (0.02)
72	A transportadora não conseguiu entregar a tempo todas as	encomendas (0.45)	caixas (0.14) cartas (0.14) coisas (0.05) entregas (0.05) roupas (0.05) embalagens (0.02) flores (0.02) mobílias (0.02) pizzas (0.02) prendas (0.02)
73	A menina arrumou os casacos todos no	armário (0.45)	cabide (0.2) closet (0.1) guarda-roupa (0.1) quarto (0.1) roupeiro (0.05)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
74	O Vítor colocou um pouco mais de doce no	pão (0.45)	bolo (0.23) prato (0.1) café (0.05) crepe (0.05) leite (0.05) chá (0.03) chão (0.03) lanche (0.03)
75	O professor reparou que o texto tinha alguns	erros (0.45)	problemas (0.14) lapsos (0.08) pormenores (0.06) defeitos (0.04) disparates (0.04) acertos (0.02) borrões (0.02) desenhos (0.02) dígitos (0.02) dilemas (0.02) enganos (0.02) números (0.02) parágrafos (0.02) pontos (0.02)
76	A mãe pediu-lhe para guardar os talheres na	gaveta (0.45)	cozinha (0.11) prateleira (0.11) estante (0.06) mala (0.06) mesa (0.04) sala (0.04) cómoda (0.02) dispensa (0.02) fruteira (0.02) lancheira (0.02) máquina (0.02) sacola (0.02)
77	O professor disse que só podiam fazer perguntas no final da	aula (0.45)	explicação (0.09) apresentação (0.06) experiência (0.04) cadeira (0.04) matéria (0.04) semana (0.04) sessão (0.04) actividade (0.02) classe (0.02) conversa (0.02) história (0.02) hora (0.02) leitura (0.02) palestra (0.02) pergunta (0.02) prova (0.02)
78	A Carla estava a ver televisão deitada no	sofá (0.44)	chão (0.35) colchão (0.06) tapete (0.06) beliche (0.02) cadeirão (0.02) cobertor (0.02) colo (0.02) quarto (0.02)
79	O rapaz deu-lhe o troco todo em	moedas (0.44)	notas (0.34) cêntimos (0.06) dinheiro (0.04) rebuçados (0.04) euros (0.02) francos (0.02) moedinhas (0.02) papel (0.02)
80	Estava tanto calor que trocou os sapatos por umas	sandálias (0.44)	chinelas (0.15) sabrinas (0.15) botas (0.07) havaianas (0.07) alpercatas (0.02) chanatas (0.02) galochas (0.02) sapatilhas (0.02) vans (0.02)
81	A Teresa estava tão cansada que sentou-se logo num	banco (0.44)	sofá (0.17) canto (0.10) cadeirão (0.07) lugar (0.05) café (0.02) escravo (0.02) espaço (0.02) estrado (0.02) muro (0.02) pilar (0.02) tronco (0.02)
82	O menino quando pousou o saco das compras partiu os	ovos (0.44)	copos (0.17) frascos (0.08) dentes (0.06) vidros (0.06) dedos (0.04) biscoitos (0.02) braços (0.02) joelhos (0.02) leites (0.02) pés (0.02) refrigerantes (0.02) vinhos (0.02)
83	Depois da licenciatura o Hugo decidiu fazer um	mestrado (0.44)	estágio (0.18) doutoramento (0.13) curso (0.10) intervalo (0.05) estudo (0.04) intercambio (0.04) Interrail (0.04) trabalho (0.04)
84	A educadora pediu-lhes antes de se sentarem para lavarem as	mãos (0.44)	mesas (0.15) cadeiras (0.08) cabeças (0.05) caras (0.05) malas (0.05) almofadas (0.04) frases (0.04) ideias (0.04) palavras (0.04) mantas (0.04) rimas (0.04) tintas (0.04)
85	Quando chegou a casa o Rafael foi passear os	cães (0.43)	gatos (0.22) animais (0.17) amigos (0.04) filhos (0.04) irmãos (0.04) sapatos (0.04)
86	A Sara para ficar mais elegante calçou as suas bonitas	botas (0.43)	meias (0.13) calças (0.09) luvas (0.09) sabrinas (0.09) sandálias (0.09) saltos (0.04) sapatilhas (0.04)
87	Antes de ir de férias o Joel fez a	mala (0.43)	cama (0.09) lista (0.09) bagagem (0.04) barba (0.04) depilação (0.04) despedida (0.04) faxina (0.04) marcação (0.04) mochila (0.04) reserva (0.04) revisão (0.04)
88	O Gonçalo deixou de gorjeta um	euro (0.43)	cêntimo (0.26) centavo (0.04) bombom (0.02) décimo (0.02) dinheiro (0.02) doce (0.02) dólar (0.02) empregado (0.02) homem (0.02) lápis (0.02) lenço (0.02) rebuçado (0.02) senhor (0.02) tostão (0.02)
89	A Marisa quando abriu a carteira viu que não tinha nenhuma	moeda (0.43)	nota (0.41) fotografia (0.04) caneta (0.02) chave (0.02) esmola (0.02) esperança (0.02) factura (0.02) identificação (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
90	O pai costuma ler todos os dias o	jornal (0.43)	livro (0.22) diário (0.10) anúncio (0.02) blogue (0.02) boletim (0.02) cão (0.02) conto (0.02) filho (0.02) horóscopo (0.02) irmão (0.02) jogo (0.02) noticiário (0.02) obituário (0.02) relatório (0.02) trabalho (0.02)
91	O Afonso pediu à mãe para lhe coser aquelas	calças (0.43)	meias (0.33) camisas (0.10) camisolas (0.05) luvas (0.05) peúgas (0.05)
92	Os escuteiros estiveram a construir alguns ninhos para os	pássaros (0.43)	animais (0.12) pardais (0.10) pombos (0.10) cucos (0.05) melros (0.05) castores (0.02) coelhos (0.02) falcões (0.02) patos (0.02) periquitos (0.02) ratos (0.02) tordos (0.02)
93	No verão a Sara prefere calçar as suas	sandálias (0.43)	havaianas (0.15) sabrinas (0.15) sapatilhas (0.09) meias (0.06) chinelas (0.04) Paez (0.04) chanatas (0.02) peúgas (0.02)
94	O pai disse-lhes que só podiam brincar depois de acabarem os	trabalhos (0.43)	deveres (0.30) estudos (0.06) legumes (0.04) testes (0.04) afazeres (0.02) banhos (0.02) desenhos animados (0.02) exames (0.02) exercícios (0.02) problemas (0.02)
95	A menina queria vestir nesse dia o seu novo	vestido (0.43)	casaco (0.21) blusão (0.06) top (0.06) conjunto (0.04) macacão (0.04) acessório (0.02) blusão (0.02) cachecol (0.02) calçado (0.02) calção (0.02) colete (0.02) lenço (0.02)
96	A Ana entrou na loja porque gostou da saia que viu na	montra (0.43)	vitrine (0.13) loja (0.06) prateleira (0.06) manequim (0.04) modelo (0.04) amiga (0.04) exposição (0.02) internet (0.02) mesa (0.02) senhora (0.02) escola (0.02) amostra (0.02) menina (0.02) rua (0.02) televisão (0.02)
97	A Inês pediu à mãe para pintar as	unhas (0.42)	paredes (0.27) telas (0.06) aguarelas (0.03) almofadas (0.03) camas (0.03) camisolas (0.03) estantes (0.03) janelas (0.03) grades (0.03) mesas (0.03)
98	A criança estava a comer com um garfo e uma	faca (0.42)	colher (0.42) mão (0.06) amiga (0.02) caneta (0.02) colega (0.02) concha (0.02) tigela (0.02)
99	Para chegar ao décimo andar a Mara ia sempre de	elevador (0.42)	escadas (0.42) tênis (0.06) ascensor (0.02) boleia (0.02) colo (0.02) escadote (0.02) helicóptero (0.02)
100	Quando ia comer a sopa reparou que não tinha	colher (0.42)	guardanapo (0.13) prato (0.08) sal (0.08) batata (0.06) sopa (0.06) fome (0.04) ervilhas (0.02) espinafres (0.02) legumes (0.02) luz (0.02) paciência (0.02) talher (0.02) vontade (0.02)
101	Como chegou atrasado ao aeroporto o Hugo perdeu o	avião (0.42)	voo (0.21) amigo (0.06) autocarro (0.04) comboio (0.04) embarque (0.04) transporte (0.04) táxi (0.04) combinado (0.02) computador (0.02) entusiasmo (0.02) passaporte (0.02) telemóvel (0.02) transfer (0.02)
102	A professora aconselhou-o a fazer as contas usando a	calculadora (0.42)	cabeça (0.29) caneta (0.09) mão (0.04) máquina (0.04) fórmula (0.02) folha (0.02) Internet (0.02) mente (0.02) tabuada (0.02)
103	A professora pediu-lhe para completar a	frase (0.42)	tarefa (0.13) equação (0.04) história (0.04) pergunta (0.04) resposta (0.04) actividade (0.02) aula (0.02) carta (0.02) conclusão (0.02) definição (0.02) discussão (0.02) figura (0.02) ideia (0.02) missão (0.02) música (0.02) sequência (0.02) teoria (0.02)
104	O Pedro foi aos correios levantar as	cartas (0.42)	encomendas (0.42) caixas (0.05) contas (0.05) notificações (0.05)
105	Como estava muito cansada decidiu ir cedo para a	cama (0.42)	casa (0.18) escola (0.08) faculdade (0.05) habitação (0.05) sala (0.05) associação (0.03) cidade (0.03) discoteca (0.03) festa (0.03) instituição (0.03) paragem (0.03)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
106	A equipa perdeu o campeonato apenas por dois	pontos (0.42)	golos (0.3) jogos (0.04) minutos (0.04) segundos (0.04) sets (0.04) cestos (0.02) décimos (0.02) jogadores (0.02) penaltis (0.02) pontos (0.02) valores (0.02)
107	O António começou a ir ao ginásio para perder a	gordura (0.42)	barriga (0.26) banha (0.13) celulite (0.03) coxa (0.03) desmotivação (0.03) mania (0.03) preguiça (0.03) vergonha (0.03)
108	Quando chegou a casa viu que tinha deixado aberta a	porta (0.42)	janela (0.4) cozinha (0.04) garagem (0.04) água (0.02) arca (0.02) gaveta (0.02) luz (0.02) portinhola (0.02) torneira (0.02)
109	Para finalizar a prova tinham de escrever um	texto (0.42)	artigo (0.11) poema (0.11) relatório (0.05) resumo (0.04) bilhete (0.02) comentário (0.02) diálogo (0.02) discurso (0.02) ditado (0.02) ensaio (0.02) excerto (0.02) livro (0.02) método (0.02) modo (0.02) parágrafo (0.02) pouco (0.02) resumo (0.02) teatro (0.02) transporte (0.02)
110	A avó antes de ir podar calçou umas	botas (0.42)	luvas (0.21) meias (0.17) sandálias (0.17) sapatilhas (0.04)
111	A Madalena esqueceu-se de entregar o relatório ao seu	professor (0.42)	colega (0.13) chefe (0.08) médico (0.06) patrão (0.06) amigo (0.06) supervisor (0.04) treinador (0.04) diretor (0.02) orientador (0.02) reitor (0.02) superior (0.02) tutor (0.02)
112	A Júlia só soube do acidente quando viu as	notícias (0.42)	mensagens (0.19) chamadas (0.08) fotografias (0.06) pessoas (0.06) ambulâncias (0.04) amigas (0.02) cicatrizes (0.02) feridas (0.02) ligações (0.02) multidões (0.02) revistas (0.02) vítimas (0.02)
113	Para manter a forma decidiu fazer exercício no	ginásio (0.42)	jardim (0.11) quarto (0.09) parque (0.08) sofá (0.04) caderno (0.02) campo (0.02) chão (0.02) computador (0.02) estádio (0.02) fim-de-semana (0.02) intervalo (0.02) livro (0.02) paredão (0.02) passeio (0.02) pátio (0.02) ringue (0.02) tapete (0.02) trabalho (0.02)
114	A Maria comprou mais um selo para a sua	coleção (0.42)	carta (0.22) amiga (0.07) avó (0.07) mãe (0.05) agenda (0.02) caderneta (0.02) caixinha (0.02) capa (0.02) carteira (0.02) correspondência (0.02) pasta (0.02)
115	A avó esteve a cuidar das flores do seu	jardim (0.41)	quintal (0.10) canteiro (0.10) campo (0.07) marido (0.07) vaso (0.07) cão (0.03) gato (0.03) neto (0.03) quarto (0.03) terraço (0.03)
116	A Paula colocou os talheres na	mesa (0.41)	gaveta (0.24) máquina (0.17) bancada (0.04) cozinha (0.04) boca (0.02) pia (0.02) sala (0.02) toalha (0.02)
117	O aluno avisou que iria terminar mais cedo a	aula (0.41)	tarefa (0.24) prova (0.12) apresentação (0.09) palestra (0.06) conversa (0.03) exame (0.03) reunião (0.03)
118	A menina estava triste porque tirou má nota no	exame (0.41)	teste (0.40) trabalho (0.09) artigo (0.04) curso (0.02) método (0.02) relatório (0.02) secundário (0.02)
119	O António tem carta de carros e também de	motas (0.41)	pesados (0.23) autocarro (0.09) camião (0.09) aviões (0.05) barcos (0.05) bicicleta (0.05) quadriciclos (0.05)
120	Antes de ir dormir o menino deu-lhe um	beijo (0.41)	abraço (0.32) brinquedo (0.05) sorriso (0.05) ataque (0.02) chocolate (0.02) estalo (0.02) livro (0.02) presente (0.02) rebuçado (0.02) riso (0.02) xarope (0.02)
121	A aluna não podia chegar atrasada aquela	aula (0.41)	cadeira (0.06) reunião (0.06) sessão (0.06) conferência (0.04) tarde (0.04) almoçarada (0.02) casa (0.02) entrevista (0.02) experiência (0.02) ficha (0.02) lição (0.02) manhã (0.02) marcação (0.02) palestra (0.02) prova (0.02) sala (0.02) situação (0.02) tarefa (0.02) turma (0.02) vez (0.02) visita (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
122	O Francisco limpou o nariz com um	lenço (0.41)	papel (0.26) guardanapo (0.13) dedo (0.06) pano (0.06) casaco (0.02) cotonete (0.02) toalhete (0.02) trapo (0.02) jornal (0.02)
123	Como faltou à aula pediu a uma colega para copiar os	apontamentos (0.41)	resumos (0.17) exercícios (0.07) slides (0.07) textos (0.05) trabalhos (0.05) registos (0.03) tópicos (0.03) TPC (0.03) cadernos (0.02) cálculos (0.02) estudos (0.02) resultados (0.02) sumários (0.02)
124	A Margarida adora dançar por isso vai a muitas	festas (0.41)	discotecas (0.27) aulas (0.16) saídas (0.05) apresentações (0.03) boates (0.03) competição (0.03) demonstrações (0.03)
125	Quando olhou para a sua mão viu que tinha perdido o	anel (0.40)	telemóvel (0.19) dedo (0.07) relógio (0.07) dinheiro (0.05) verniz (0.05) brinco (0.02) cartão (0.02) chapéu (0.02) elástico (0.02) lápis (0.02) passe (0.02) porta-chaves (0.02)
126	O Manuel foi à garagem buscar o	carro (0.40)	martelo (0.12) cão (0.04) pano (0.04) telemóvel (0.04) ancinho (0.02) berbequim (0.02) brinquedo (0.02) comando (0.02) computador (0.02) detergente (0.02) dossier (0.02) escadote (0.02) frigorífico (0.02) instrumento (0.02) jipe (0.02) livro (0.02) machado (0.02) pneu (0.02) prego (0.02) serrote (0.02) sofá (0.02) taco (0.02) veículo (0.02)
127	Quando caiu a Salomé torceu o	pé (0.40)	pulso (0.18) braço (0.12) tornozelo (0.11) joelho (0.05) pescoço (0.05) dedo (0.04) nariz (0.04) sobrolho (0.02)
128	O pai do André contava sempre aquela	história (0.40)	anedota (0.23) piada (0.16) memória (0.05) aventura (0.04) coisa (0.02) droga (0.02) lenda (0.02) parte (0.02) parvoíce (0.02) peripécia (0.02) situação (0.02)
129	O alpinista foi resgatado de	helicóptero (0.40)	avião (0.3) avioneta (0.1) avalanche (0.1) barco (0.1)
130	O placard do aeroporto anunciava um atraso no	voo (0.40)	avião (0.33) horário (0.1) écran (0.05) trajecto (0.05) embarque (0.03) previsto (0.03) transporte (0.03)
131	A Catarina sobrevoou a cidade num	avião (0.40)	helicóptero (0.2) balão (0.13) jacto (0.1) carro (0.03) instante (0.03) paraquedas (0.03) táxi (0.03) unicórnio (0.03)
132	O Dinis gosta de dormir naquela	cama (0.40)	sala (0.2) casa (0.08) divisão (0.08) hora (0.08) almofada (0.04) estrada (0.04) posição (0.04) praia (0.04)
133	O professor alertou que iria terminar mais cedo a	aula (0.40)	palestra (0.12) apresentação (0.08) conferência (0.08) reunião (0.08) tarefa (0.08) avaliação (0.04) experiência (0.04) explicação (0.04) matéria (0.04)
134	A Daniela comprou o caderno naquela	loja (0.40)	papelaria (0.26) rua (0.1) escola (0.06) noite (0.04) freira (0.02) gráfica (0.02) livraria (0.02) retrosaria (0.02) secretaria (0.02) tarde (0.02) viela (0.02)
135	O Gonçalo escreveu à namorada um bonito	poema (0.40)	texto (0.28) postal (0.06) bilhete (0.04) cartão (0.04) soneto (0.04) artigo (0.02) discurso (0.02) e-mail (0.02) livro (0.02) recado (0.02) soneto (0.02) telegrama (0.02)
136	Durante a noite o menino foi picado por um	mosquito (0.40)	bicho (0.28) insecto (0.19) abelhão (0.03) acaro (0.02) alfinete (0.02) escaravelho (0.02) lagarto (0.02) lápis (0.02) réptil (0.02)
137	Como estava frio a Inês colocou na sua cama mais um	cobertor (0.40)	lençol (0.31) edredão (0.19) colchão (0.04) agasalho (0.02) peluche (0.02) saco (0.02)
138	O jardineiro antes de ir para o jardim calçou umas	botas (0.40)	luvas (0.27) galochas (0.10) meias (0.08) jardineiras (0.04) calças (0.02) chinelas (0.02) Crocs (0.02) sandálias (0.02) sapatilhas (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
139	A avó vai sempre comprar legumes ao	mercado (0.40)	supermercado (0.37) Continente (0.07) minimercado (0.05) centro comercial (0.02) jardim (0.02) Mini-preço (0.02) Pingo Doce (0.02) vizinho (0.02)
140	O Rui precisava de trocar a pilha do	comando (0.40)	relógio (0.23) rádio (0.07) jogo (0.05) rato (0.05) telemóvel (0.05) alarme (0.02) boneco (0.02) brinquedo (0.02) carro (0.02) computador (0.02) despertador (0.02) monitor (0.02)
141	O apresentador estava a gravar um novo	programa (0.40)	episódio (0.12) vídeo (0.12) disco (0.07) take (0.05) álbum (0.02) anúncio (0.02) áudio (0.02) capítulo (0.02) documentário (0.02) espectáculo (0.02) filme (0.02) papel (0.02) telejornal (0.02) tema (0.02) trabalho (0.02)
142	A Liliana colocou o lápis no	estojo (0.40)	caderno (0.09) bolso (0.07) cabelo (0.05) chão (0.05) saco (0.05) lixo (0.05) armário (0.02) baú (0.02) cacifo (0.02) carro (0.02) colo (0.02) lábio (0.02) lugar (0.02) nariz (0.02) pote (0.02) quarto (0.02) tampo (0.02)
143	A Diana gostou de todos os vestidos daquela	loja (0.40)	amiga (0.07) coleção (0.07) marca (0.07) boutique (0.04) menina (0.04) montra (0.04) parte (0.04) pedicura (0.04) pessoa (0.04) rua (0.04) secção (0.04) senhora (0.04) tia (0.04) zona (0.04)
144	O pai pediu-lhe para pendurar a camisa naquele	cabide (0.39)	armário (0.25) sítio (0.08) bengaleiro (0.06) lugar (0.06) roupeiro (0.06) banco (0.02) camiseiro (0.02) canto (0.02) lugar (0.02) puxador (0.02)
145	O André reparou que tinha rasgado as suas	calças (0.39)	meias (0.28) folhas (0.11) cuecas (0.09) luvas (0.07) camisas (0.02) mangas (0.02) páginas (0.02)
146	Ao passar no túnel os passageiros ficaram sem	luz (0.39)	ar (0.17) rede (0.17) vista (0.09) cor (0.04) folego (0.04) internet (0.04) palavras (0.04)
147	A Filipa colocou os pratos em cima da	mesa (0.39)	bancada (0.17) prateleira (0.13) toalha (0.07) cabeça (0.04) cadeira (0.04) cómoda (0.02) estante (0.04) loiça (0.02) pedra (0.02) secretaria (0.02) tábua (0.02)
148	Ele estava tão chateado que bateu com a	porta (0.39)	cabeça (0.22) mão (0.17) janela (0.10) perna (0.05) cadeira (0.02) cara (0.02) mala (0.02)
149	O menino andou duas semanas com um tala por ter partido um	dedo (0.39)	braço (0.27) pé (0.12) osso (0.10) pulso (0.05) cotovelo (0.02) joelho (0.02) tornozelo (0.02)
150	Na primavera o jardim dos avós fica cheio de	flores (0.39)	folhas (0.07) fruta (0.07) árvores (0.05) bichos (0.05) plantas (0.05) pássaros (0.05) abelhas (0.03) mosquitos (0.03) relva (0.03) andorinhas (0.02) animais (0.02) cores (0.02) ervas (0.02) formigas (0.02) insectos (0.02) pólen (0.02) rosas (0.02) sol (0.02) vegetais (0.02)
151	O Miguel decidiu comprar pipocas quando foi ao	cinema (0.39)	supermercado (0.19) teatro (0.07) metro (0.05) café (0.03) banho (0.02) centro comercial (0.02) circo (0.02) concerto (0.02) Continente (0.02) espetáculo (0.02) estádio (0.02) festival (0.02) fórum (0.02) hipermercado (0.02) Imax (0.02) jantar (0.02) jardim (0.02) jogo (0.02) mercado (0.02) parque (0.02)
152	A mãe pediu-lhe para não fechar a	porta (0.39)	janela (0.26) casa (0.04) garagem (0.04) luz (0.04) persiana (0.04) boca (0.02) caixa (0.02) embalagem (0.02) garrafa (0.02) gaveta (0.02) lancheira (0.02) loja (0.02) mala (0.02) mesa (0.02) panela (0.02) prateleira (0.02)
153	O António foi à biblioteca consultar um	livro (0.39)	artigo (0.18) jornal (0.10) amigo (0.04) trabalho (0.04) arquivo (0.02) caderno (0.02) computador (0.02) diário (0.02) dicionário (0.02) documento (0.02) ensaio (0.02) manual (0.02) senhor (0.02) relatório (0.02) site (0.02) texto (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
154	O aluno de erasmus queria conhecer novas pessoas e diversas	culturas (0.39)	idades (0.16) personalidades (0.07) línguas (0.05) áreas (0.02) atracções (0.02) aventuras (0.02) discotecas (0.02) etnias (0.02) festas (0.02) gastronomias (0.02) histórias (0.02) ideias (0.02) localidades (0.02) matérias (0.02) nacionalidades (0.02) novidades (0.02) obras (0.02) opiniões (0.02)
155	A Francisca sabia que aquilo não era um mosquito era um outro	insecto (0.38)	bicho (0.31) animal (0.29) voador (0.02)
156	A Francisca foi ao jardim buscar duas pequenas	flores (0.38)	folhas (0.12) frutas (0.08) meninas (0.08) plantas (0.08) rosas (0.08) amoras (0.04) borboletas (0.04) maçãs (0.04) papoilas (0.04) pedras (0.04)
157	No final do curso receberam um	diploma (0.38)	prémio (0.15) certificado (0.13) abraço (0.04) papel (0.04) presente (0.04) relógio (0.04) beijinho (0.02) crédito (0.02) cupão (0.02) discurso (0.02) doce (0.02) emprego (0.02) estágio (0.02) louvor (0.02) título (0.02)
158	Quando estava a lavar a loiça a Laura partiu um	copo (0.38)	prato (0.35) jarro (0.05) garfo (0.03) talher (0.03) cesto (0.02) bule (0.02) dedo (0.02) detergente (0.02) pano (0.02) pé (0.02) Pirex (0.02) tabuleiro (0.02) talher (0.02)
159	O pai pediu-lhe para ir buscar uma cerveja fresca ao	frigorífico (0.38)	congelador (0.17) café (0.15) bar (0.09) supermercado (0.09) armário (0.04) vizinho (0.04) balcão (0.02) quarto (0.02)
160	O Eduardo antes de sair de casa faz sempre a	cama (0.38)	mala (0.17) comida (0.11) barba (0.09) limpeza (0.04) mochila (0.04) alimentação (0.02) coisas (0.02) higiene (0.02) marmita (0.02) refeição (0.02) reza (0.02) roupa (0.02) sesta (0.02)
161	O Frederico decidiu não passar a ferro o	casaco (0.38)	fato (0.09) colete (0.06) polo (0.06) boné (0.03) blazer (0.03) blusão (0.03) cachecol (0.03) calção (0.03) camiseiro (0.03) chapéu (0.03) cinto (0.03) gorro (0.03) laço (0.03) lençol (0.03) pijama (0.03) pullover (0.03) tapete (0.03)
162	O Eduardo foi aos correios buscar as	cartas (0.38)	encomendas (0.38) prendas (0.05) caixas (0.04) coisas (0.04) correspondência (0.04) embalagens (0.02) mala (0.02) mercadorias (0.02) receitas (0.02)
163	Como o chá estava tão quente queimou a	língua (0.38)	boca (0.29) mão (0.19) garganta (0.05) avó (0.02) bochecha (0.02) cara (0.02) pele (0.02) perna (0.02) pulseira (0.02)
164	A Mónica antes de ir ao supermercado fez uma	lista (0.38)	corrida (0.07) paragem (0.05) pausa (0.05) actividade (0.02) amiga (0.02) aposta (0.02) birra (0.02) chamada (0.02) compra (0.02) escolha (0.02) festa (0.02) nota (0.02) paragem (0.02) permanente (0.02) pesquisa (0.02) planificação (0.02) redação (0.02) revisão (0.02) sandes (0.02) sesta (0.02) tarte (0.02) viagem (0.02)
165	O Henrique foi comprar uma coleira para o seu	cão (0.38)	gato (0.34) animal (0.08) coelho (0.06) hamster (0.04) cavalo (0.02) filho (0.02) furão (0.02) irmão (0.02) periquito (0.02)
166	O Henrique a jogar à bola rompeu as	calças (0.38)	meias (0.22) chuteiras (0.12) sapatilhas (0.1) cuecas (0.06) luvas (0.04) botas (0.02) camisas (0.02) camisolas (0.02) caneleiras (0.02)
167	O menino não chegava ao livro que estava na última	prateleira (0.38)	estante (0.26) gaveta (0.16) sala (0.04) aula (0.02) edição (0.02) ficha (0.02) fila (0.02) janela (0.02) página (0.02) secção (0.02) semana (0.02)
168	O aluno teve o melhor resultado da sua	turma (0.38)	vida (0.24) escola (0.18) classe (0.04) aldeia (0.02) carreira (0.02) cidade (0.02) empresa (0.02) época (0.02) faculdade (0.02) freguesia (0.02) resposta (0.02)
169	O pai todos os dias vai regar o	jardim (0.38)	quintal (0.22) pessegueiro (0.1) arbusto (0.04) canteiro (0.04) limoeiro (0.04) alpendre (0.02) campo (0.02) cato (0.02) girassol (0.02) pomar (0.02) sobreiro (0.02) terreno (0.02) tomilho (0.02) vaso (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
170	O pai do André foi à escola falar com o	professor (0.38)	director (0.29) filho (0.05) funcionário (0.05) André (0.03) amigo (0.03) colega (0.03) assistente (0.02) auxiliar (0.02) inspector (0.02) miúdo (0.02) presidente (0.02) principal (0.02) segurança (0.02)
171	Depois do ginásio o Hugo só teve tempo de tomar um	banho (0.38)	duche (0.29) café (0.16) comprimido (0.07) chá (0.04) iogurte (0.02) lanche (0.02) sumo (0.02)
172	A secretária apontou à pressa o recado num	papel (0.38)	caderno (0.24) bloco (0.13) post-it (0.07) computador (0.04) livro (0.04) canto (0.02) dossier (0.02) guardanapo (0.02) talão (0.02)
173	O agente disse para apresentar queixa na	polícia (0.38)	esquadra (0.36) GNR (0.04) guarda (0.04) junta (0.04) loja (0.04) altura (0.02) caixa (0.02) internet (0.02) repartição (0.02)
174	Ele plantou mais de dezena de árvores de fruto no seu	quintal (0.38)	jardim (0.33) pomar (0.13) território (0.08) relvado (0.04) vaso (0.04)
175	Quando ouviu os gritos na rua foi espreitar à	janela (0.38)	porta (0.30) varanda (0.14) rua (0.11) entrada (0.03) cozinha (0.02) esquina (0.02) estrada (0.02)
176	O César acordou sobressaltado quando tocou o	despertador (0.38)	telemóvel (0.25) alarme (0.23) telefone (0.05) rádio (0.04) pager (0.02) relógio (0.02) sino (0.02)
177	O António tem carta de carro e também de	mota (0.38)	camião (0.16) pesados (0.16) autocarro (0.13) barco (0.06) avião (0.03) comboio (0.03) táxi (0.03) tractor (0.03)
178	A mãe descobriu que a filha dizia muitas	asneiras (0.38)	coisas (0.13) palavras (0.13) mentiras (0.08) piadas (0.08) barbaridades (0.04) faltas (0.04) falsidades (0.04) negas (0.04) parvoíces (0.04)
179	A menina estava a fazer castelos na praia com um	balde (0.38)	amigo (0.2) ancinho (0.08) menino (0.08) primo (0.08) rapaz (0.05) tio (0.05) brinquedo (0.03) desconhecido (0.03) material (0.03) molde (0.03)
180	O Filipe está sempre a jogar no	computador (0.38)	telemóvel (0.21) quarto (0.11) tablet (0.09) campo (0.07) parque (0.04) casino (0.02) intervalo (0.02) Ipad (0.02) jardim (0.02) pátio (0.02) recreio (0.02)
181	Como a dor nas costas não passava decidiu ir ao	médico (0.38)	hospital (0.21) fisioterapeuta (0.10) doutor (0.06) ginásio (0.04) massagista (0.04) osteopata (0.04) bruxo (0.02) centro (0.02) consultório (0.02) especialista (0.02) médico (0.02) ortopedista (0.02)
182	O empresário já estava há mais de duas horas naquela	reunião (0.37)	sala (0.25) conferência (0.10) fila (0.04) situação (0.04) bagunça (0.02) conversa (0.02) entrevista (0.02) frustração (0.02) instituição (0.02) lengalenga (0.02) mesa (0.02) palestra (0.02) posição (0.02) tentativa (0.02)
183	Naquele apartamento as flores crescem vigorosamente na	varanda (0.37)	janela (0.17) sala (0.11) cozinha (0.06) marquise (0.06) parede (0.06) relva (0.06) terra (0.06) estrada (0.03) jarra (0.03)
184	A Júlia guardou os sapatos numa	caixa (0.37)	gaveta (0.15) prateleira (0.17) mala (0.09) sapateira (0.07) estante (0.04) sala (0.04) arrecadação (0.02) dispensa (0.02) montra (0.02) sacola (0.02)
185	O menino não sabia que a borboleta era um	animal (0.37)	insecto (0.37) bicho (0.16) ser-vivo (0.11)
186	O avô usa sempre em cima do pijama um	casaco (0.37)	robe (0.21) roupão (0.21) cobertor (0.16) echarpe (0.05)
187	A Sara riu-se muito quando lhe contaram aquela	piada (0.37)	história (0.32) anedota (0.19) graça (0.04) charada (0.02) coisa (0.02) fofoca (0.02) situação (0.02) tolice (0.02)
188	Os meninos estavam a perder o jogo por dois	pontos (0.37)	golos (0.24) zero (0.16) segundos (0.05) um (0.05) cestos (0.03) minutos (0.03) tempos (0.03) três (0.03) valores (0.03)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
189	Depois de pintar o quadro o João foi comprar novas	tintas (0.37)	telas (0.32) cores (0.07) aguarelas (0.04) roupas (0.04) batas (0.02) botas (0.02) camisolas (0.02) canetas (0.02) calças (0.02) ideias (0.02) imagens (0.02) molduras (0.02) placas (0.02) sapatilhas (0.02)
190	O treinador estava chateado por terem perdido o	jogo (0.37)	campeonato (0.11) torneio (0.11) desafio (0.08) combate (0.05) autocarro (0.03) capitão (0.03) controle (0.03) contrato (0.03) equipamento (0.03) jantar (0.03) juízo (0.03) papel (0.03) prémio (0.03) treino (0.03) troféu (0.03)
191	Os miúdos estavam contentes porque iam começar as	aulas (0.37)	férias (0.37) actividades (0.15) festas (0.03) aventuras (0.02) bolsas (0.02) brincadeiras (0.02) diversões (0.02) surpresas (0.02)
192	Durante o acampamento o Rui foi picado por um	mosquito (0.37)	insecto (0.20) bicho (0.10) escorpião (0.10) abelhão (0.05) pássaro (0.05) alfinete (0.02) besouro (0.02) caranguejo (0.02) colega (0.02) lacrau (0.02) ouriço (0.02)
193	Antes de entrar no consultório teve de preencher uma	ficha (0.37)	folha (0.27) declaração (0.05) formulário (0.05) autorização (0.02) papelada (0.05) candidatura (0.02) carta (0.02) coisa (0.02) etiqueta (0.02) inscrição (0.02) questionário (0.02) requisição (0.02) tabela (0.02)
194	A menina canta e dança muito bem é mesmo uma	artista (0.37)	bailarina (0.07) cantora (0.07) dançarina (0.07) estrela (0.07) talentosa (0.07) perfeccionista (0.05) profissional (0.05) antipática (0.02) ditosa (0.02) querida (0.02) performer (0.02) prendada (0.02) princesa (0.02) virtuosa (0.02)
195	Como não tinha o livro foi comprá-lo aquela	loja (0.37)	livraria (0.23) papelaria (0.19) biblioteca (0.06) amiga (0.04) feira (0.04) gráfica (0.02) moça (0.02) rua (0.02) senhora (0.02)
196	Todas as semanas o Bruno vai visitar o avô ao	lar (0.37)	hospital (0.31) norte (0.06) cemitério (0.04) Porto (0.04) Alentejo (0.02) bar (0.02) Barreiro (0.02) café (0.02) campo (0.02) centro (0.02) dormitório (0.02) jardim (0.02) parque (0.02) restaurante (0.02)
197	O namorado ofereceu-lhe um ramo de	flores (0.37)	rosas (0.29) tulipas (0.13) margaridas (0.11) orquídeas (0.03) arbusto (0.02) árvore (0.02) espinhos (0.02) malmequeres (0.02) petúncias (0.02)
198	O professor ia ter uma reunião com o reitor da	escola (0.36)	faculdade (0.36) universidade (0.25) secundária (0.02)
199	O pai disse-lhe para ter cuidado ao atravessar a	rua (0.36)	estrada (0.36) passadeira (0.15) ponte (0.06) cidade (0.03) praceta (0.03)
200	A Sofia quando está nervosa fica com dores de	cabeça (0.36)	barriga (0.33) costas (0.09) garganta (0.09) estômago (0.06) coração (0.03) dentes (0.03)
201	A Carlota comprou umas pulseiras para oferecer às suas	amigas (0.36)	irmãs (0.16) primas (0.16) tias (0.13) colegas (0.07) avós (0.05) filhas (0.04) vizinhas (0.02)
202	A professora disse-lhe para fazer as contas usando a	calculadora (0.36)	cabeça (0.33) mão (0.09) folha (0.07) máquina (0.05) caderno (0.02) mente (0.02) matemática (0.02) SPSS (0.02) tabela (0.02) tecla (0.02)
203	O ferido em estado muito grave foi transportado de	ambulância (0.36)	helicóptero (0.22) carro (0.14) avião (0.12) INEM (0.03) maca (0.03) autocarro (0.02) emergência (0.02) comboio (0.02) seguida (0.02) táxi (0.02)
204	A Rita fica sempre corada quando fala com aquele	rapaz (0.36)	amigo (0.16) menino (0.08) professor (0.11) colega (0.07) homem (0.05) individuo (0.05) vizinho (0.03) estranho (0.02) garoto (0.02) moleque (0.02) senhor (0.02) sujeito (0.02)
205	O Nuno aponta tudo no seu	caderno (0.36)	telemóvel (0.20) bloco (0.11) computador (0.07) diário (0.05) dossiê (0.05) livro (0.03) tablet (0.03) cérebro (0.02) dicionário (0.02) Ipad (0.02) Post-it (0.02) quarto (0.02) telefone (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
206	O Tiago não deu gorjeta porque não tinha	dinheiro (0.36)	moedas (0.15) vontade (0.10) paciência (0.08) carteira (0.07) gostado (0.03) mais (0.03) notas (0.03) troco (0.03) dívidas (0.02) fugido (0.02) interesse (0.02) motivo (0.02) nada (0.02) suficiente (0.02) tempo (0.02)
207	A Andreia foi à florista comprar	flores (0.36)	rosas (0.28) lírios (0.04) margaridas (0.12) malmequeres (0.08) orquídeas (0.04) petúnias (0.04) ramos (0.04)
208	A avó abriu a caixa de chocolates e disse-lhe para tirar um	chocolate (0.36)	bombom (0.16) pedaço (0.08) quadrado (0.08) pequeno (0.04) pouco (0.04) caramelo (0.04) coelho (0.04) grande (0.04) bocado (0.04) redondo (0.04) doce (0.04)
209	Os meninos no intervalo foram comprar um saco de	gomas (0.36)	batatas (0.08) comida (0.08) pão (0.08) berlindes (0.04) bolachas (0.04) cabedal (0.04) chocolates (0.04) doces (0.04) frutas (0.04) guloseimas (0.04) penas (0.04) pipocas (0.04) plumas (0.04)
210	O diretor decidiu premiar os melhores	alunos (0.36)	trabalhadores (0.12) funcionários (0.08) professores (0.08) estudantes (0.06) participantes (0.06) candidatos (0.04) docentes (0.04) jogadores (0.04) atletas (0.02) auxiliares (0.02) colaboradores (0.02) concorrentes (0.02) desportistas (0.02) rapazes (0.02)
211	A professora pediu-lhe para fazer o desenho naquela	folha (0.36)	mesa (0.12) tela (0.08) parede (0.06) aula (0.04) hora (0.04) página (0.04) parede (0.04) tarde (0.04) altura (0.02) capa (0.02) escola (0.02) mesa (0.02) noite (0.02) posição (0.02) prateleira (0.02) sala (0.02) superfície (0.02)
212	A professora levou todos os exames na sua	mala (0.36)	pasta (0.28) mochila (0.14) bolsa (0.06) mão (0.06) carteira (0.03) biblioteca (0.02) casa (0.02) mota (0.02) sala (0.02)
213	A Mariana perdeu os seus preciosos brincos de	ouro (0.36)	prata (0.34) pérolas (0.13) cobre (0.04) diamantes (0.04) bronze (0.02) casamento (0.02) latão (0.02) plástico (0.02) Viana (0.02)
214	A Sara vestiu o seu pijama quentinho e calçou umas	pantufas (0.36)	meias (0.43) botas (0.14) camisolas (0.04) luvas (0.04)
215	O menino disse à mãe que lhe doía a	cabeça (0.36)	mão (0.18) perna (0.18) barriga (0.14) anca (0.04) bochecha (0.04) testa (0.04) virilha (0.04)
216	A Conceição todos os dias limpa a	casa (0.36)	cozinha (0.21) sala (0.14) janela (0.07) cama (0.04) casa-de-banho (0.04) loiça (0.04) rua (0.04) varanda (0.04) vivenda (0.04)
217	O Nuno ao domingo costuma ver um	filme (0.36)	programa (0.13) documentário (0.13) jogo (0.07) vídeo (0.05) amigo (0.04) anime (0.04) espectáculo (0.04) familiar (0.04) cão (0.02) carro (0.02) concerto (0.02) episódio (0.02) pássaro (0.02) sem-abrigo (0.02) teatro (0.02)
218	Quando abriu a bolsa viu que se tinha esquecido da	carteira (0.36)	chave (0.16) caneta (0.11) maquilhagem (0.05) nota (0.05) agenda (0.04) água (0.04) carta (0.04) almofada (0.02) autorização (0.02) factura (0.02) fotografia (0.02) lancheira (0.02) mala (0.02) medalha (0.02) nota (0.02) pasta (0.02)
219	A menina leu em voz alta um bonito	texto (0.36)	poema (0.34) livro (0.12) excerto (0.05) cartão (0.02) conto (0.02) discurso (0.02) recado (0.02) resumo (0.02) testamento (0.02) testemunho (0.02) verso (0.02)
220	O Rui não queria fazer a aula de surf porque tinha	medo (0.36)	frio (0.17) receio (0.12) vergonha (0.10) dores (0.07) febre (0.03) asma (0.02) caído (0.02) calor (0.02) comido (0.02) dificuldades (0.02) enjoos (0.02) fome (0.02) óculos (0.02) sono (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
221	A Marta quando conduz costuma ouvir	música (0.36)	rádio (0.16) buzinas (0.07) barulho (0.04) notícias (0.04) pássaros (0.04) rock (0.04) vozes (0.04) Beatles (0.02) carros (0.02) cds (0.02) fado (0.02) Kpop (0.02) pessoas (0.02) pop (0.02) trance (0.02) Santana (0.02)
222	O avô plantou mais uma árvore no	jardim (0.35)	quintal (0.32) terreno (0.08) pomar (0.06) campo (0.05) chão (0.03) bosque (0.02) canteiro (0.02) monte (0.02) passeio (0.02) quarto (0.02) terraço (0.02)
223	O Gil dizia que se ganhasse o euromilhões compraria uma	casa (0.35)	mota (0.16) viagem (0.05) avioneta (0.03) bicicleta (0.03) ilha (0.03) loja (0.03) mansão (0.03) moradia (0.03) piscina (0.03) vela (0.03) vivenda (0.03) baleia (0.02) banheira (0.02) caravana (0.02) carrinha (0.02) carteira (0.02) escrava (0.02) mulher (0.02) praia (0.02) quinta (0.02)
224	O avô foi buscar uma alface ao	quintal (0.35)	supermercado (0.20) jardim (0.18) mercado (0.10) armário (0.02) bar (0.02) cesto (0.02) frigorífico (0.02) madeirense (0.02) pomar (0.02) quarto (0.02) terreno (0.02) vizinho (0.02)
225	O professor ficou chateado porque ninguém sabia a	resposta (0.35)	matéria (0.18) pergunta (0.14) data (0.06) hora (0.04) história (0.04) lição (0.04) matéria (0.04) conclusão (0.02) conta (0.02) música (0.02) questão (0.02) sala (0.02) solução (0.02)
226	O Vítor não teve nota máxima porque falhou uma	pergunta (0.35)	resposta (0.19) questão (0.11) alínea (0.07) aula (0.04) conta (0.04) palavra (0.04) análise (0.02) coisa (0.02) expressão (0.02) frequência (0.02) letra (0.02) opção (0.02) parte (0.02) subtração (0.02) vez (0.02)
227	O Miguel dá todos os dias ao gato um pouco de	comida (0.35)	ração (0.11) leite (0.11) água (0.09) carinho (0.04) mimos (0.04) alimento (0.02) atenção (0.02) biscoitos (0.02) brincadeira (0.02) carne (0.02) catnip (0.02) festas (0.02) gelado (0.02) legumes (0.02) peixe (0.02) pizza (0.02) queijo (0.02) sopa (0.02) vitaminas (0.02)
228	Como emagreceu tanto a Raquel teve de comprar novas	roupas (0.35)	calças (0.23) camisolas (0.16) saias (0.07) camisas (0.05) blusas (0.04) coisas (0.04) comidas (0.02) fardas (0.02) gabardines (0.02) peças (0.02)
229	O cão passou a tarde a roer os	ossos (0.35)	sapatos (0.18) brinquedos (0.11) tapetes (0.09) móveis (0.07) calções (0.04) livros (0.04) assentos (0.02) atacadores (0.02) cadernos (0.02) chinelos (0.02) desenhos (0.02) paus (0.02) ratos (0.02) sofás (0.02)
230	Aos sábados a mãe costuma ir às compras ao	supermercado (0.35)	mercado (0.23) Shopping (0.11) Continete (0.11) centro (0.05) Lidl (0.03) Minipreço (0.03) Colombo (0.01) Fórum (0.01) hipermercado (0.01) Jumbo (0.01) lado (0.01) mercearia (0.01) minimercado (0.01) Modelo (0.01)
231	O Afonso foi expulso da aula porque bateu no	colega (0.35)	professor (0.21) amigo (0.16) João (0.08) quadro (0.05) irmão (0.03) Afonso (0.02) aluno (0.02) André (0.02) António (0.02) armário (0.02) funcionário (0.02) Miguel (0.02) menino (0.02)
232	A grávida passou aquele mês cheia de	dores (0.35)	enjoos (0.16) contrações (0.10) cólicas (0.08) desejos (0.08) insónias (0.03) vômitos (0.03) alegria (0.02) apetite (0.02) cócegas (0.02) comichão (0.02) felicidade (0.02) fome (0.02) medo (0.02) receio (0.02) remorsos (0.02) sonhos (0.02) sono (0.02)
233	A Bruna foi à aldeia visitar a sua querida	avó (0.35)	amiga (0.20) tia (0.18) mãe (0.09) prima (0.09) irmã (0.05) família (0.02) neta (0.02) ovelha (0.02) professora (0.02) vizinha (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
234	A Helena não conseguia dançar porque lhe doía o	pé (0.35)	joelho (0.17) tornozelo (0.11) braço (0.09) calcanhar (0.05) dedo (0.05) pescoço (0.05) estômago (0.03) ombro (0.03) coração (0.02) corpo (0.02) dedo (0.02) peito (0.02) rabo (0.02) tronco (0.02)
235	O funcionário pediu-lhe ajuda para conseguir acabar aquele	trabalho (0.35)	relatório (0.13) serviço (0.09) inquérito (0.07) teste (0.07) documento (0.04) jogo (0.04) projecto (0.04) requerimento (0.04) embrulho (0.02) exame (0.02) folheto (0.02) lote (0.02) questionário (0.02) registo (0.02)
236	Estava tão pouco inspirado que só conseguiu escrever uma	frase (0.35)	palavras (0.19) página (0.15) linha (0.08) carta (0.04) composição (0.04) história (0.04) letra (0.04) música (0.04) quadra (0.04)
237	A aluna estava tão cansada que não conseguia acabar os	trabalhos (0.35)	testes (0.12) relatórios (0.12) resumos (0.12) estudos (0.08) apontamentos (0.04) artigos (0.04) desenhos (0.04) deveres (0.04) exames (0.04) exercícios (0.04)
238	O bebé brincou com o patinho enquanto estava na	banheira (0.35)	cama (0.13) sala (0.10) praia (0.08) cozinha (0.06) piscina (0.06) rua (0.06) água (0.04) quinta (0.04) cadeira (0.02) casa (0.02) casa-de-banho (0.02) creche (0.02) escola (0.02)
239	O bebé meteu o brinquedo na	boca (0.35)	caixa (0.15) alfofa (0.04) blusa (0.04) calça (0.04) camisola (0.04) cara (0.04) cesta (0.04) janela (0.04) mão (0.04) mochila (0.04) nariz (0.04) orelha (0.04) sanita (0.04) testa (0.04)
240	O Pedro estava a coxear porque sentia uma dor no	pé (0.34)	joelho (0.28) tornozelo (0.14) dedo (0.10) calcanhar (0.07) fémur (0.07)
241	O João apontou o número novo da amiga no	telemóvel (0.34)	caderno (0.28) papel (0.17) bloco (0.07) braço (0.03) computador (0.03) pulso (0.03) telefone (0.03)
242	A avó todos os dias rega as suas	plantas (0.34)	flores (0.34) árvores (0.10) alfaces (0.09) hortas (0.03) rosas (0.03) laranjeiras (0.02) margaridas (0.02) orquídeas (0.02)
243	O Rodrigo estacionou o carro na	garagem (0.34)	rua (0.28) passadeira (0.10) avenida (0.03) entrada (0.03) estação (0.03) estrada (0.03) praça (0.03) subida (0.03) vaga (0.03) valeta (0.03)
244	O professor passou vários dias a corrigir os	testes (0.34)	trabalhos (0.22) exames (0.17) textos (0.11) erros (0.08) alunos (0.03) pontos (0.02) rapazes (0.02) slides (0.02)
245	O António foi à papelaria comprar uma	caneta (0.34)	folha (0.11) borracha (0.05) caderneta (0.05) lapiseira (0.05) revista (0.05) afia (0.03) agenda (0.03) capa (0.03) cola (0.03) esferográfica (0.03) mica (0.03) mochila (0.03) pulseira (0.03) raspadinha (0.03) régua (0.03) resma (0.03) sebenta (0.03) tesoura (0.03)
246	O Rodrigo tropeçou ao subir a	escada (0.34)	rua (0.17) rampa (0.11) montanha (0.09) escadaria (0.06) árvore (0.04) colina (0.04) cadeira (0.02) janela (0.02) ladeira (0.02) mesa (0.02) passadeira (0.02) prima (0.02) torre (0.02)
247	O menino não entrou porque estava com medo do	cão (0.34)	escuro (0.12) gato (0.08) homem (0.06) pai (0.06) palhaço (0.06) ladrão (0.04) senhor (0.04) auxiliar (0.02) avô (0.02) colega (0.02) dentista (0.02) estranho (0.02) João (0.02) monstro (0.02) polícia (0.02) professor (0.02) tio (0.02)
248	Nas férias a Maria queria ir muitas vezes à	praia (0.34)	piscina (0.14) escola (0.06) biblioteca (0.04) feira (0.04) loja (0.04) rua (0.04) água (0.02) aldeia (0.02) Alemanha (0.02) América (0.02) cidade (0.02) costa (0.02) discoteca (0.02) esplanada (0.02) farmácia (0.02) gelataria (0.02) missa (0.02) natação (0.02) neve (0.02) Noruega (0.02) Suécia (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
249	Os assaltantes roubaram um valioso anel de	diamantes (0.34)	ouro (0.25) prata (0.15) rubi (0.09) noivado (0.08) casamento (0.02) esmeraldas (0.02) pechisbeque (0.02) pérola (0.02) safiras (0.02)
250	O Nuno tomou os suplementos recomendados pela sua	médica (0.34)	mãe (0.21) amiga (0.09) nutricionista (0.09) doutora (0.06) avó (0.04) farmacêutica (0.04) mulher (0.04) colega (0.02) namorada (0.02) prima (0.02) psiquiatra (0.02) treinadora (0.02)
251	No final do estágio o Luís tinha de entregar um	relatório (0.34)	trabalho (0.19) texto (0.13) documento (0.06) papel (0.04) resumo (0.04) agradecimento (0.02) artigo (0.02) cabide (0.02) certificado (0.02) contributo (0.02) crachá (0.02) depoimento (0.02) exame (0.02) questionário (0.02) relatório (0.02) testemunho (0.02)
252	O Rui ficou a trabalhar até tarde e decidiu avisar a	mãe (0.34)	mulher (0.18) namorada (0.18) avó (0.09) filha (0.09) amiga (0.04) irmã (0.04) esposa (0.02) família (0.02) tia (0.02)
253	Naquela noite os jovens decidiram ir a uma	festa (0.34)	discoteca (0.27) casa (0.14) loja (0.05) praia (0.04) biblioteca (0.02) farmácia (0.02) favela (0.02) gala (0.02) palestra (0.02) pizzeria (0.02) rave (0.02) saída (0.02) viagem (0.02)
254	O atleta falhou o pódio apenas por uns	segundos (0.34)	pontos (0.20) metros (0.12) centímetros (0.05) instantes (0.05) milissegundos (0.05) pontos (0.05) minutos (0.03) anos (0.02) concorrentes (0.02) meses (0.02) quilómetros (0.02) passos (0.02) percalço (0.02)
255	O jogador não gostou da decisão do	treinador (0.34)	arbitro (0.32) colega (0.15) adversário (0.06) adepto (0.03) mister (0.03) amigo (0.02) atleta (0.02) pai (0.02) público (0.02)
256	A professora pediu-lhe para fazer o desenho no	caderno (0.34)	quadro (0.31) livro (0.10) papel (0.06) computador (0.03) papel (0.03) bloco (0.02) chão (0.02) diário (0.02) dossier (0.02) local (0.02) manual (0.02) quadriculado (0.02) tablet (0.02)
257	Todos os atletas no final da prova receberam um	prémio (0.34)	diploma (0.15) troféu (0.06) aplauso (0.05) elogio (0.05) certificado (0.05) abraço (0.03) chocolate (0.03) lanche (0.03) agradecimento (0.02) beijo (0.02) bolo (0.02) brinde (0.02) bónus (0.02) carimbo (0.02) convite (0.02) louvor (0.02) medalha (0.02) objecto (0.02) obrigada (0.02) presente (0.02) saco (0.02)
258	O Francisco não consegue engomar as	camisas (0.34)	calças (0.32) camisolas (0.11) roupas (0.06) meias (0.05) blusas (0.03) gravatas (0.03) calções (0.02) cuecas (0.02) mangas (0.02) t-shirt (0.02)
259	A Vânia guardou o talão na sua	carteira (0.34)	mala (0.34) bolsa (0.12) mochila (0.06) casa (0.03) agenda (0.02) caixa (0.02) camisola (0.02) compra (0.02) loja (0.02) pasta (0.02) roupa (0.02)
260	Naquela praia decorria um torneio de	voleibol (0.34)	futebol (0.28) surf (0.15) basquetebol (0.05) natação (0.03) tênis (0.03) amigos (0.02) badminton (0.02) bodyboard (0.02) futsal (0.02) mergulho (0.02) padel (0.02) raquetes (0.02) rugby (0.02)
261	O Tiago não teve muita piada a contar aquela	história (0.33)	piada (0.30) anedota (0.26) cena (0.04) idiotice (0.04) lengalenga (0.04)
262	O Ricardo deu-lhe um beijo na	boca (0.33)	bochecha (0.26) testa (0.23) cara (0.13) cabeça (0.04) mão (0.04)
263	O Simão chegou atrasado à faculdade porque perdeu o	autocarro (0.33)	comboio (0.30) metro (0.30) barco (0.03) passe (0.01) táxi (0.01)
264	O adepto estava triste porque já não arranhou nenhum	bilhete (0.33)	lugar (0.22) amigo (0.11) autógrafo (0.11) cachecol (0.11) apoiante (0.06) companheiro (0.06)
265	Para esconder a cicatriz no pescoço a Francisca usa sempre um	cachecol (0.33)	lenço (0.29) colar (0.21) casaco (0.04) fio (0.04) fita (0.04) turbante (0.04)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
266	O artista encheu de cores muito vibrantes as suas	obras (0.33)	pinturas (0.29) telas (0.21) criações (0.04) galerias (0.04) ilustrações (0.04) paredes (0.04)
267	A menina antes de ir dormir bebeu um copo de	leite (0.33)	água (0.28) sumo (0.20) chá (0.07) café (0.04) vinho (0.04) batido (0.02) chocolate (0.02)
268	A aluna esqueceu-se de imprimir o	trabalho (0.33)	relatório (0.21) artigo (0.13) livro (0.13) documento (0.08) caderno (0.04) rótulo (0.04) texto (0.04)
269	A Daniela não conseguia estudar porque tinha muito	sono (0.33)	medo (0.15) stress (0.15) trabalho (0.15) barulho (0.07) cansaço (0.07) peso (0.04) problema (0.04)
270	O António estava distraído e entornou o	leite (0.33)	café (0.21) copo (0.17) chá (0.08) sumo (0.08) chávena (0.04) jarro (0.04) prato (0.04)
271	A Carlota foi almoçar com as suas	amigas (0.33)	tias (0.22) primas (0.2) irmãs (0.08) colegas (0.07) avós (0.05) bonecas (0.02) namoradas (0.02) vizinhas (0.02)
272	A Maria apenas por duas décimas não entrou naquela	faculdade (0.33)	escola (0.22) universidade (0.11) cadeira (0.06) competição (0.06) prova (0.06) lista (0.06) seleção (0.06) trem (0.06)
273	As frutas do avô são tão boas porque vêm do seu	quintal (0.33)	pomar (0.25) jardim (0.22) terreno (0.07) cultivo (0.04) terraço (0.03) trabalho (0.03) horta (0.01) monte (0.01)
274	O César arrumou todos os livros do ano anterior no	armário (0.33)	quarto (0.19) sótão (0.19) cacifo (0.11) armazém (0.04) caixote (0.04) carro (0.04) escritório (0.04) estante (0.04)
275	A menina pediu ao avô para lhe encher o	copo (0.33)	prato (0.19) jarro (0.11) bolso (0.07) pote (0.07) saco (0.07) balde (0.04) depósito (0.04) frasco (0.04) quarto (0.04)
276	Junto ao mar voava um conjunto de	gaivotas (0.33)	pássaros (0.25) aves (0.08) abutres (0.04) andorinhas (0.04) chapéus (0.04) corvos (0.04) folhas (0.04) insectos (0.04) pardais (0.04) pelicanos (0.04)
277	A Maria arrumou a vassoura na	despensa (0.33)	cozinha (0.27) varanda (0.10) sala (0.08) arrecadação (0.04) cave (0.04) garagem (0.04) marquise (0.04) casa-de-banho (0.02) gaveta (0.02) lavandaria (0.02)
278	O Vasco comprou há dois meses os bilhetes para o	concerto (0.33)	cinema (0.13) espetáculo (0.11) teatro (0.11) festival (0.10) jogo (0.08) avião (0.03) boxe (0.02) evento (0.03) filme (0.03) arraial (0.02) museu (0.02)
279	A Vanessa quando lavava o chão entornou o	balde (0.33)	sumo (0.15) café (0.10) detergente (0.10) produto (0.08) leite (0.05) líquido (0.05) brinco (0.04) chá (0.04) copo (0.04) sabão (0.04) vinho (0.04)
280	As mulheres muçulmanas usam sempre um	lenço (0.33)	véu (0.17) burca (0.07) pano (0.07) turbante (0.07) vestido (0.07) anel (0.03) cachecol (0.03) chapéu (0.03) hijab (0.03) manto (0.03) pó (0.03) telemóvel (0.03)
281	O avô sempre disse que não queria ir viver num	lar (0.33)	apartamento (0.15) prédio (0.11) barco (0.07) asilo (0.04) bairro (0.04) barraco (0.04) campo (0.04) carro (0.04) duplex (0.04) hospício (0.04) instituto (0.04) sítio (0.04)
282	O Tiago depois da corrida ficou com dores na	perna (0.33)	cabeça (0.17) barriga (0.14) mão (0.08) anca (0.06) coxa (0.06) coluna (0.03) braço (0.02) cervical (0.02) musculatura (0.02) omoplata (0.02) orelha (0.02) vesícula (0.02) virilha (0.02)
283	O Artur não conseguia trabalhar porque tinha uma grande dor de	cabeça (0.33)	dentes (0.16) barriga (0.14) costas (0.14) estômago (0.06) ouvidos (0.03) coração (0.02) cotovelo (0.02) intestino (0.02) juízo (0.02) mão (0.02) olhos (0.02) pernas (0.02) pés (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
284	A aluna receava não ter estudado o suficiente para a	prova (0.33)	aula (0.13) avaliação (0.10) ficha (0.10) apresentação (0.08) frequência (0.08) audição (0.02) cadeira (0.02) cena (0.02) disciplina (0.02) leitura (0.02) palestra (0.02) reunião (0.02) tarefa (0.02)
285	O turista achou que era muito perigoso andar naquela	rua (0.33)	cidade (0.16) estrada (0.16) zona (0.12) área (0.04) bicicleta (0.04) avenida (0.02) circunstância (0.02) diversão (0.02) estação (0.02) floresta (0.02) ponte (0.02) praia (0.02) ravina (0.02)
286	O Pedro deixa sempre o carro na	garagem (0.33)	rua (0.22) estrada (0.11) avenida (0.03) casa (0.03) entrada (0.03) escola (0.03) estação (0.03) farmácia (0.03) frente (0.03) loja (0.03) mãe (0.03) passadeira (0.03) porta (0.03) praça (0.03)
287	O pai arrumou a caixa de ferramentas na	garagem (0.33)	arrecadação (0.08) cave (0.08) prateleira (0.08) cozinha (0.07) despensa (0.07) gaveta (0.07) sala (0.07) estante (0.05) casa (0.02) cômoda (0.02) mala (0.02) mochila (0.02) oficina (0.02) secretaria (0.02)
288	A Carla queria comprar para a sua sala um novo	sofá (0.33)	televisor (0.17) tapete (0.11) candeeiro (0.09) computador (0.06) cadeirão (0.04) móvel (0.04) quadro (0.04) aparador (0.02) aparelho (0.02) armário (0.02) espelho (0.02) pufe (0.02) relógio (0.02) vaso (0.02)
289	O Eduardo passa muitas horas a jogar no seu	computador (0.33)	telemóvel (0.23) quarto (0.12) tablet (0.05) jardim (0.03) Playstation (0.03) sofá (0.03) videogame (0.03) brinquedo (0.02) celular (0.02) Gameboy (0.02) mundo (0.02) portátil (0.02) quarto (0.02) recreio (0.02) X-box (0.02)
290	A Raquel viu um vestido muito bonito na	Loja (0.33)	montra (0.17) Mango (0.08) Zara (0.08) Berskha (0.06) escola (0.04) rua (0.04) Baixa (0.02) colega (0.02) feira (0.02) Internet (0.02) botequim (0.02) Maria (0.02) modelo (0.02) prima (0.02) varanda (0.02)
291	A avó cuida com gosto das suas	netas (0.33)	flores (0.15) plantas (0.12) filhas (0.07) roupas (0.07) gatas (0.05) jóias (0.03) amigas (0.02) araras (0.02) botas (0.02) cadelas (0.02) casas (0.02) crianças (0.02) galinhas (0.02) irmãs (0.02) janelas (0.02) rendas (0.02) sobrinhas (0.02)
292	A estrada foi cortada por causa do	acidente (0.33)	trânsito (0.2) tempo (0.13) nevoeiro (0.03) atropelamento (0.02) autocarro (0.02) cão (0.02) clima (0.02) congestionamento (0.02) cortejo (0.02) evento (0.02) desastre (0.02) fogo (0.02) homem (0.02) incêndio (0.02) jogo (0.02) pavimento (0.02) temporal (0.02) terramoto (0.02) tronco (0.02) vento (0.02) Sócrates (0.02)
293	A Raquel à refeição bebe sempre	água (0.33)	sumo (0.29) vinho (0.15) chá (0.05) cerveja (0.04) leite (0.04) refrigerante (0.04) café (0.02) Coca-cola (0.02) absinto (0.01) Compal (0.01)
2394	O pai tentava ensiná-la a andar de	bicicleta (0.33)	patins (0.21) carro (0.12) skate (0.10) trotinete (0.07) mota (0.06) cavalo (0.03) costas (0.01) frente (0.01) pé (0.01) saltos (0.01) trás (0.01)
295	O professor pediu-lhe para ler aquele	texto (0.33)	livro (0.19) excerto (0.10) poema (0.07) parágrafo (0.06) artigo (0.04) documento (0.04) resumo (0.03) trabalho (0.03) autor (0.01) capítulo (0.01) dicionário (0.01) exercício (0.01) papel (0.01) verso (0.01)
296	A Vera pede sempre uma fatia de bolo de	chocolate (0.33)	laranja (0.16) iogurte (0.15) morango (0.06) cenoura (0.04) amêndoa (0.03) baunilha (0.03) bolacha (0.03) ananás (0.01) aniversário (0.01) anos (0.01) banana (0.01) caramelo (0.01) curgete (0.01) lima (0.01) limão (0.01) noz (0.01) Oreo (0.01) sábio (0.01)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
297	A Carolina foi brincar para casa da sua	amiga (0.33)	prima (0.22) avó (0.13) tia (0.13) vizinha (0.08) mãe (0.06) colega (0.03) irmã (0.03)
298	A avó cuida das flores do seu	jardim (0.33)	quintal (0.20) vaso (0.11) filho (0.10) neto (0.07) marido (0.05) vizinho (0.03) canteiro (0.02) genro (0.02) irmão (0.02) parque (0.02) pomar (0.02) relvado (0.02) terraço (0.02)
299	Como estava uma noite fria a Inês foi buscar mais um	casaco (0.33)	cobertor (0.15) cachecol (0.11) lençol (0.11) agasalho (0.07) gorro (0.05) xaile (0.05) edredão (0.03) aconchego (0.02) aquecimento (0.02) chá (0.02) peluche (0.02) pullover (0.02) roupão (0.02)
300	O jogador lesionou-se e teve de ser operado ao	joelho (0.33)	pé (0.22) braço (0.17) ombro (0.17) tornozelo (0.03) gémeo (0.02) menisco (0.02) pescoço (0.02) pulso (0.02)
301	A Mariana foi jantar com o seu	namorado (0.33)	pai (0.24) amigo (0.17) irmão (0.09) marido (0.05) avô (0.03) tio (0.03) afilhado (0.02) cónjuge (0.02) filho (0.02)
302	A Marisa teve de voltar a casa porque rompeu as	calças (0.33)	meias (0.29) collants (0.09) botas (0.07) cuecas (0.05) águas (0.03) blusas (0.02) camisolas (0.02) costuras (0.02) jardineiras (0.02) leggings (0.02) sabrinhas (0.02) sandálias (0.02) sapatilhas (0.02)
303	O Daniel comprou os manuais naquela	loja (0.33)	livraria (0.24) papelaria (0.16) altura (0.03) biblioteca (0.03) semana (0.03) tarde (0.03) banca (0.02) cidade (0.02) época (0.02) escola (0.02) manhã (0.02) quarta-feira (0.02) rua (0.02) zona (0.02)
304	O Paulo queria aprender novas músicas para tocar na sua	guitarra (0.33)	bateria (0.11) flauta (0.09) viola (0.09) harpa (0.07) banda (0.05) festa (0.05) gaita (0.05) audição (0.02) aula (0.02) cerimónia (0.02) garagem (0.02) harmónica (0.02) ocarina (0.02) performance (0.02) trompete (0.02)
305	O Rui depois de almoçar tomou um	café (0.33)	comprimido (0.24) chá (0.13) digestivo (0.05) abatanado (0.02) aperitivo (0.02) banho (0.02) bolo (0.02) copo (0.02) gim (0.02) licor (0.02) medicamento (0.02) paracetamol (0.02) refrigerante (0.02) relaxante (0.02) sumo (0.02) whiskey (0.02) xarope (0.02)
306	A bailarina ainda não tinha decorado a nova	coreografia (0.33)	dança (0.31) música (0.17) apresentação (0.02) actuação (0.02) fala (0.02) melodia (0.02) peça (0.02) personagem (0.02) rotina (0.02) roupa (0.02) saia (0.02) sala (0.02)
307	A Helena foi ao museu ver a nova	exposição (0.33)	pintura (0.13) escultura (0.10) arte (0.06) artista (0.04) colecção (0.04) galeria (0.04) obra (0.04) aquisição (0.02) apresentação (0.02) boneca (0.02) estátua (0.02) fotografia (0.02) imagem (0.02) múmia (0.02) obra (0.02) parte (0.02) peça (0.02) rapariga (0.02) sala (0.02)
308	No passeio pelo parque o Júlio deu comida aos	pombos (0.33)	pássaros (0.15) cães (0.1) gatos (0.1) patos (0.1) animais (0.08) esquilos (0.08) amigos (0.03) ratos (0.03) sem-abrigo (0.03)
309	A Maria foi apontar tudo na	agenda (0.33)	folha (0.23) mesa (0.13) caderneta (0.1) lista (0.08) cabeça (0.03) carteira (0.03) cozinha (0.03) mão (0.03) sala (0.03) sebenta (0.03)
310	O avô plantou no seu jardim mais uma	árvore (0.32)	flor (0.27) planta (0.21) macieira (0.05) erva (0.03) pereira (0.03) rosa (0.03) alface (0.02) ameixoeira (0.02) erva (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
311	A menina passou a tarde a brincar com as	bonecas (0.32)	amigas (0.31) primas (0.13) irmãs (0.06) Barbies (0.02) cadelas (0.02) canetas (0.02) colegas (0.02) crianças (0.02) filhas (0.02) flores (0.02) pulseiras (0.02) roupas (0.02) tias (0.02) vizinhas (0.02)
312	O Gustavo foi buscar o seu carro à	oficina (0.32)	garagem (0.31) loja (0.08) rua (0.08) inspeção (0.07) mãe (0.03) avó (0.02) concessionária (0.02) estação (0.02) porta (0.02) praia (0.02) revisão (0.02)
313	O menino levou para o lanche duas	sandes (0.32)	maças (0.24) bolachas (0.15) bananas (0.05) bebidas (0.03) peras (0.03) amigas (0.02) batatas (0.02) frutas (0.02) lancheiras (0.02) laranjas (0.02) pizzas (0.02) sopas (0.02) tangerinas (0.02) tortas (0.02) tostas (0.02)
314	A planta era muito grande para por naquele	vaso (0.32)	jarro (0.14) sítio (0.11) espaço (0.07) jardim (0.07) lugar (0.07) canto (0.04) cesto (0.04) local (0.04) quarto (0.04) quintal (0.04) terreno (0.04)
315	O César arrumou os livros do ano anterior no	armário (0.32)	sótão (0.27) quarto (0.18) armazém (0.04) cacifo (0.04) caixote (0.04) escritório (0.04) baú (0.02) chão (0.02) contentor (0.02) lixo (0.02) móvel (0.02)
316	Quando abriu a carteira viu que tinha perdido um	cartão (0.32)	euro (0.16) bilhete (0.09) cêntimo (0.09) talão (0.07) documento (0.05) papel (0.04) recibo (0.04) cheque (0.02) cupão (0.02) livro (0.02) pin (0.02) relógio (0.02) sapato (0.02) telemóvel (0.02) tostão (0.02)
317	O pai pediu-lhe para ir lá fora levar o	lixo (0.32)	cão (0.32) carro (0.05) amigo (0.04) gato (0.04) saco (0.04) almoço (0.02) brinquedo (0.02) caixote (0.02) comer (0.02) correio (0.02) irmão (0.02) João (0.02) livro (0.02) martelo (0.02) pão (0.02) papel (0.02)
318	Para fazer o exercício a Cíntia pediu ao colega a	caneta (0.32)	folha (0.14) calculadora (0.11) borracha (0.09) lapiseira (0.05) resposta (0.05) esferográfica (0.04) bolsa (0.02) cooperação (0.02) máquina (0.02) palavra (0.02) palavra-passe (0.02) pasta (0.02) pergunta (0.02) plataforma (0.02) régua (0.02) resolução (0.02) roupa (0.02)
319	A Fernanda guarda as suas valiosas joias no	cofre (0.32)	quarto (0.21) armário (0.19) banco (0.06) baú (0.04) roupeiro (0.04) bolso (0.02) caixão (0.02) esconderijo (0.02) estojo (0.02) guarda-joias (0.02) joalheiro (0.02) saco (0.02) sofá (0.02)
320	O advogado estava há três horas numa	reunião (0.32)	conferência (0.15) audiência (0.11) sala (0.11) palestra (0.09) conversa (0.04) fila (0.04) sessão (0.04) apresentação (0.02) aula (0.02) chamada (0.02) discussão (0.02) investigação (0.02)
321	A Francisca foi ao jardim buscar mais duas	flores (0.32)	rosas (0.13) maçãs (0.09) laranjas (0.06) alfaces (0.04) margaridas (0.04) plantas (0.04) peras (0.04) amigas (0.02) batatas (0.02) bebidas (0.02) cenouras (0.02) cervejas (0.02) pás (0.02) pedras (0.02) pinhas (0.02) pombas (0.02) tangerinas (0.02) tulipas (0.02)
322	O André já comprou o cavalete para as suas	pinturas (0.32)	obras (0.27) aulas (0.14) artes (0.09) esculturas (0.05) filhas (0.05) filmagens (0.05) irmãs (0.05)
323	Quando chegou ao quarto a Cristina ligou o	computador (0.32)	telemóvel (0.25) aquecedor (0.07) candeeiro (0.07) rádio (0.07) ar condicionado (0.05) telefone (0.05) televisor (0.05) atendedor (0.02) interruptor (0.02) microondas (0.02) portátil (0.02)
324	A Maria não resistiu e comeu mais um bocado de	bolo (0.32)	chocolate (0.17) lasanha (0.09) carne (0.05) doce (0.05) gelado (0.03) peixe (0.03) pizza (0.03) pudim (0.03) sobremesa (0.03) caviar (0.02) comida (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
			entremeada (0.02) feijoada (0.02) folhado (0.02) frango (0.02) pão (0.02) pastel (0.02) puré (0.02) queijo (0.02) salame (0.02) sandes (0.02) tarte (0.02)
325	A Inês quase foi atropelada quando atravessava a	rua (0.32)	estrada (0.29) passadeira (0.29) avenida (0.03) escola (0.02) esquina (0.02) faixa (0.02) ponte (0.02) via (0.02)
326	A Adélia foi ao sapateiro buscar as suas	botas (0.32)	sapatilhas (0.22) sandálias (0.16) sabrinas (0.13) compras (0.03) malas (0.03) facturas (0.02) crocs (0.02) carteiras (0.02) encomendas (0.02) meias (0.02) havaianas (0.02) solas (0.02)
327	Por causa da inundação tiveram de cortar a	luz (0.32)	água (0.27) electricidade (0.24) árvore (0.05) canalização (0.05) brincadeira (0.02) estrada (0.02) rua (0.02)
328	A avó foi passear com os netos para o	parque (0.32)	jardim (0.29) campo (0.10) rio (0.07) bosque (0.02) centro (0.02) lago (0.02) mercado (0.02) palácio (0.02) planetário (0.02) quintal (0.02) relvado (0.02) zoo (0.02)
329	O Simão colocou um piercing no	umbigo (0.32)	nariz (0.3) mamilo (0.13) lábio (0.1) ouvido (0.05) dedo (0.02) olho (0.02) pé (0.02) pescoço (0.02) rabo (0.02) sobrolho (0.02)
330	A Carlota para resolver a equação teve de pedir ajuda ao	professor (0.32)	colega (0.15) amigo (0.13) pai (0.13) explicador (0.07) irmão (0.03) João (0.03) Miguel (0.03) tutor (0.03) avô (0.02) Manuel (0.02) mentor (0.02) namorado (0.02)
331	O Rafael tem um sono leve e acorda com qualquer	barulho (0.32)	ruído (0.15) som (0.15) coisa (0.12) movimento (0.08) música (0.03) batuque (0.02) cena (0.02) grito (0.02) impressão (0.02) luz (0.02) perturbação (0.02) toque (0.02) vento (0.02) vibração (0.02)
332	A Carla bebeu o café com	açúcar (0.32)	leite (0.27) natas (0.06) adoçante (0.04) chocolate (0.04) água (0.03) mel (0.03) prazer (0.03) amigos (0.01) bolachas (0.01) calma (0.01) canela (0.01) chantili (0.01) cuidado (0.01) ela (0.01) ela (0.01) frio (0.01) gosto (0.01) medo (0.01) pressa (0.01) rapidez (0.01) satisfação (0.01) sono (0.01) torradas (0.01)
333	A Maria foi para casa dos tios brincar com os	primos (0.32)	cães (0.18) gatos (0.12) brinquedos (0.11) bonecos (0.07) amigos (0.05) animais (0.04) irmãos (0.04) tios (0.04) comboios (0.02) legos (0.02) livros (0.02)
334	O bebé deixou cair ao chão o	brinquedo (0.32)	biberão (0.18) peluche (0.09) boneco (0.07) babete (0.04) garfo (0.04) prato (0.04) telemóvel (0.04) urso (0.04) animal (0.02) caderno (0.02) chocolate (0.02) chupa (0.02) copo (0.02) doce (0.02) leite (0.02) prato (0.02) sapato (0.02) talher (0.02)
335	O Igor acordou a meio da noite com um	pesadelo (0.31)	barulho (0.11) susto (0.11) grito (0.07) ruído (0.06) amigo (0.04) sobressalto (0.04) sonho (0.04) arrepio (0.02) espirro (0.02) estalido (0.02) gato (0.02) mosquito (0.02) pontapé (0.02) relógio (0.02) som (0.02) telefonema (0.02) telemóvel (0.02) tiro (0.02) vômito (0.02)
336	O Alberto todos os sábados vai jogar	futebol (0.31)	basquetebol (0.14) voleibol (0.11) andebol (0.09) xadrez (0.07) ténis (0.06) futsal (0.04) poker (0.04) fora (0.03) hóquei (0.03) bilhar (0.01) cartas (0.01) computador (0.01) Ping-Pong (0.01) Playstation (0.01)
337	O Ernesto tem centenas de macieiras no seu	quintal (0.31)	jardim (0.27) pomar (0.20) pátio (0.06) terraço (0.04) terreno (0.04) avental (0.02) monte (0.02) parque (0.02) trabalho (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
338	Como o bebé estava doente a mãe decidiu ligar à	médica (0.31)	pediatra (0.12) avó (0.10) mãe (0.10) enfermeira (0.08) doutora (0.06) amiga (0.04) escola (0.04) irmã (0.04) clínica (0.02) creche (0.02) parceira (0.02) saúde ²⁴ (0.02) Susana (0.02) tia (0.02)
339	A rapariga estava à porta e não encontrava a	chave (0.31)	mala (0.12) amiga (0.10) carteira (0.10) mãe (0.06) campainha (0.06) fechadura (0.06) saída (0.04) cadela (0.02) caneta (0.02) entrada (0.02) Joana (0.02) maçaneta (0.02) roupa (0.02) senha (0.02) Vanessa (0.02)
340	O pai disse-lhe para ir lavar os	dentes (0.31)	pés (0.24) pratos (0.10) cabelos (0.04) dedos (0.04) olhos (0.04) sapatos (0.04) tênis (0.04) cães (0.02) calções (0.02) carros (0.02) casacos (0.02) copos (0.02) lençóis (0.02) ouvidos (0.02) sofacos (0.02)
341	Quando está sozinha a Leonor costuma comer no	quarto (0.31)	bar (0.12) restaurante (0.12) refeitório (0.10) café (0.04) quintal (0.04) sofá (0.04) terraço (0.04) chão (0.02) escritório (0.02) hall (0.02) IKEA (0.02) jardim (0.02) McDonalds (0.02) parque (0.02) pátio (0.02) sótão (0.02) tabuleiro (0.02)
342	Antes de ir dormir a Marisa bebeu um copo de	Leite (0.31)	água (0.28) sumo (0.16) chá (0.13) café (0.07) vinho (0.03)
343	Para chegar ao miradouro tinha de subir mais	escadas (0.31)	alto (0.19) ruas (0.13) depressa (0.06) devagar (0.06) metros (0.06) montanhas (0.06) rampas (0.06) subidas (0.06)
344	A Joana gostou muito do vestido que viu na	loja (0.31)	montra (0.19) Zara (0.06) Primark (0.05) Bershka (0.03) festa (0.03) internet (0.03) mãe (0.03) manequim (0.03) Mango (0.03) televisão (0.03) amiga (0.02) colega (0.02) escola (0.02) internet (0.02) Maria (0.02) passerelle (0.02) praia (0.02) rapariga (0.02) rua (0.03) terça (0.02)
345	As visitas foram ver o bebé que estava a dormir no	berço (0.31)	quarto (0.18) sofá (0.18) colo (0.10) hospital (0.05) carrinho (0.05) cadeirão (0.03) dormitório (0.03) berçário (0.02) cadeira (0.02) carro (0.02) chão (0.02)
346	O João era muito traquina e estava sempre metido em	problemas (0.31)	sarilhos (0.26) confusões (0.18) apuros (0.03) brigas (0.03) chatices (0.03) alhadas (0.02) arrufos (0.02) artimanhas (0.02) asneiras (0.02) bagunças (0.02) disparates (0.02) trabalhos (0.02) traquinices (0.02) trapalhadas (0.02)
347	A mãe pediu-lhe para colocar a roupa suja no	cesto (0.31)	chão (0.16) saco (0.13) balde (0.07) lixo (0.07) quarto (0.07) armário (0.04) caixote (0.04) bacio (0.02) canto (0.02) lixo (0.02) lugar (0.02) monte (0.02)
348	O Pedro pediu ajuda ao pai para dar um nó naquela	gravata (0.31)	corda (0.22) toalha (0.07) fita (0.04) mochila (0.04) árvore (0.02) bota (0.02) cadeira (0.02) caixa (0.02) camisa (0.02) camisola (0.02) coisa (0.02) garganta (0.02) ponta (0.02) prenda (0.02) pulseira (0.02) sacola (0.02) sapatilha (0.02) trela (0.02)
349	A mãe pediu-lhe ajuda para levar até ao carro os	sacos (0.31)	livros (0.13) brinquedos (0.07) caixotes (0.04) cadernos (0.04) filhos (0.04) alimentos (0.02) amigos (0.02) animais (0.02) artigos (0.02) cães (0.02) computadores (0.02) garrações (0.02) irmãos (0.02) lençóis (0.02) mecânicos (0.02) modelos (0.02) móveis (0.02) objectos (0.02) presentes (0.02) recados (0.02) vestidos (0.02)
350	O sonho da mãe do João era que ele entrasse na	faculdade (0.31)	escola (0.18) universidade (0.11) academia (0.04) equipa (0.04) marinha (0.04) empresa (0.03) NASA (0.03) tropa (0.03) associação (0.01) banda (0.01) casa (0.01) Católica (0.01) guerra (0.01) instituição (0.01) liga (0.01) medicina (0.01) musica (0.01) Nissan (0.01) prisão (0.01) polícia (0.01) tabela (0.01) tropa (0.01) tuna (0.01)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
351	A menina não conseguia abrir aquela	janela (0.31)	porta (0.21) mala (0.14) caixa (0.10) carta (0.03) embalagem (0.03) fechadura (0.03) ficheiro (0.03) gaveta (0.03) lata (0.03) sala (0.03)
352	O João demorou muito tempo a ler aquele	livro (0.31)	artigo (0.21) texto (0.14) documento (0.09) capítulo (0.05) jornal (0.05) anúncio (0.03) parágrafo (0.03) bilhete (0.02) caderno (0.02) exercício (0.02) panfleto (0.02) recado (0.02)
353	O Frederico guardou o martelo na	caixa (0.31)	garagem (0.16) mala (0.14) gaveta (0.09) arrecadação (0.07) estante (0.05) mochila (0.05) oficina (0.03) casa (0.02) cave (0.02) cozinha (0.02) despensa (0.02) prateleira (0.02) sala (0.02)
354	O José esperou horas na fila para conseguir comprar os	bilhetes (0.31)	jogos (0.09) livros (0.07) ténis (0.07) cadernos (0.05) fones (0.05) filmes (0.03) artigos (0.02) atacadores (0.02) biscoitos (0.02) bolos (0.02) cafés (0.02) cartazes (0.02) cds (0.02) cigarros (0.02) filhos (0.02) gelados (0.02) lenços (0.02) lugares (0.02) ovos (0.02) postais (0.02) presentes (0.02) quadros (0.02) relógios (0.02) rapazes (0.02) telemóveis (0.02)
355	A professora recomendou que todos lessem o	livro (0.31)	capítulo (0.18) manual (0.15) artigo (0.13) texto (0.11) relatório (0.05) jornal (0.02) memorial (0.02) resto (0.02) trabalho (0.02)
356	Aquele jardim estava repleto de belas	flores (0.31)	árvores (0.15) rosas (0.07) margaridas (0.05) pessoas (0.05) plantas (0.04) abelhas (0.02) andorinhas (0.02) aves (0.02) beldades (0.02) borboletas (0.02) cadeiras (0.02) crianças (0.02) fontes (0.02) jarras (0.02) joaninhas (0.02) macieiras (0.02) meninas (0.02) moças (0.02) mulheres (0.02) raparigas (0.02) paisagens (0.02) petúnias (0.02) vistas (0.02)
357	Por causa da tempestade decidiram não viajar naquele	dia (0.31)	avião (0.15) momento (0.12) fim-de-semana (0.08) período (0.08) barco (0.04) comboio (0.04) jato (0.04) mês (0.04) navio (0.04) tempo (0.04) voo (0.04)
358	A Francisca quando esta nervosa costuma morder o	lábio (0.31)	dedo (0.31) cabelo (0.11) lápis (0.06) pulso (0.05) braço (0.03) casaco (0.03) cão (0.02) colar (0.02) irmão (0.02) namorado (0.02) polegar (0.02) verniz (0.02)
359	O Eduardo foi procurar o livro à	biblioteca (0.31)	livraria (0.13) estante (0.10) loja (0.08) papelaria (0.06) escola (0.05) prateleira (0.05) rua (0.03) sala (0.03) amiga (0.02) Bulhosa (0.02) casa (0.02) cómoda (0.02) feira (0.02) internet (0.02) mala (0.02) mesa (0.02) mochila (0.02) secretária (0.02)
360	O artista não podia pintar porque precisava de novas	tintas (0.31)	telas (0.22) ideias (0.14) inspirações (0.07) aguarelas (0.05) cores (0.05) pinturas (0.03) canetas (0.02) coisas (0.02) instruções (0.02) paletes (0.02) paisagens (0.02) peças (0.02) pinceis (0.02) tintas (0.02)
361	O Nuno foi ver a nova exposição daquele	pintor (0.31)	artista (0.31) museu (0.05) escultor (0.03) músico (0.03) senhor (0.03) aluno (0.02) arquitecto (0.02) autor (0.02) cantor (0.02) dia (0.02) escultor (0.02) famoso (0.02) gandulo (0.02) lugar (0.02) modelo (0.02) poeta (0.02) rapaz (0.02) sítio (0.02) tema (0.02)
362	Quando anda de barco a Leonor fica com	enjoos (0.30)	medo (0.16) dores (0.11) náuseas (0.11) frio (0.09) arrepios (0.04) fome (0.04) vômitos (0.04) alucinações (0.02) contente (0.02) febre (0.02) feliz (0.02) pavor (0.02) sede (0.02) sono (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
363	A Rita adora ir para a praia ver as	ondas (0.30)	gaivotas (0.16) pessoas (0.09) amigas (0.05) conchas (0.05) nuvens (0.05) rochas (0.05) vistas (0.05) crianças (0.04) estrelas (0.04) alforrecas (0.02) dunas (0.02) famílias (0.02) mares (0.02) meninas (0.02) paisagens (0.02)
364	O Jorge estava a passear no parque com o seu	cão (0.30)	amigo (0.24) namorado (0.11) gato (0.09) pai (0.09) filho (0.06) irmão (0.03) cachorro (0.02) cavalo (0.02) colega (0.02) lagarto (0.02) porco (0.02) primo (0.02)
365	A Marisa fez um sumo de	laranja (0.30)	maçã (0.14) limão (0.11) morango (0.11) ananás (0.05) abacaxi (0.03) beterraba (0.03) frutas (0.03) maracujá (0.03) pera (0.03) uva (0.03) abacate (0.02) banana (0.02) cenoura (0.02) frutas (0.02) gengibre (0.02) manga (0.02) melancia (0.02) melão (0.02)
366	A avó usa muitas vezes aquele colar de	pérolas (0.30)	ouro (0.19) prata (0.19) diamantes (0.14) joias (0.03) pedras (0.03) contas (0.02) cristais (0.02) esmeraldas (0.02) missangas (0.02) pintar (0.02) rafia (0.02) rubis (0.02)
367	A Bianca comprou um novo vestido para levar ao	baile (0.30)	casamento (0.24) batizado (0.08) evento (0.06) jantar (0.06) cinema (0.03) encontro (0.03) festival (0.03) almoço (0.02) amigo (0.02) concerto (0.02) desfile (0.02) espetáculo (0.02) Francisco (0.02) museu (0.02) restaurante (0.02) shopping (0.02) teatro (0.02)
368	O João não conseguiu imprimir o relatório porque não tinha	impressora (0.3)	tinteiro (0.23) papel (0.1) tempo (0.1) tinta (0.1) computador (0.07) dinheiro (0.07) folhas (0.03)
369	O Bruno quando chegou ao bar pediu uma	cerveja (0.3)	água (0.2) tosta (0.13) Coca-cola (0.1) bebida (0.07) imperial (0.07) bica (0.03) maçã (0.03) sangria (0.03) torrada (0.03)
370	O António não gostava de vestir aquelas	calças (0.3)	camisas (0.12) meias (0.12) roupas (0.12) camisolas (0.1) blusas (0.08) botas (0.06) cuecas (0.04) sandálias (0.02) sapatilhas (0.02) t-shirts (0.02)
371	A Leonor foi à festa de anos da sua	amiga (0.3)	prima (0.2) mãe (0.11) colega (0.1) tia (0.09) irmã (0.07) vizinha (0.04) avó (0.03) namorada (0.03) cunhada (0.01) madrinha (0.01)
372	Como não se sentia bem a Andreia ligou ao seu	pai (0.3)	namorado (0.17) amigo (0.16) irmão (0.11) médico (0.07) avô (0.06) primo (0.03) psicólogo (0.03) tio (0.03) conhecido (0.01) familiar (0.01) progenitor (0.01)
373	A avó todos os dias vai fazer uma caminhada no	parque (0.3)	jardim (0.25) campo (0.08) monte (0.05) passeio (0.05) pátio (0.05) rio (0.05) café (0.03) caminho (0.03) lago (0.03) paredão (0.03) quintal (0.03) salão (0.03) Tejo (0.03)
374	Quando ia começar a comer a sobremesa viu que não tinha	colher (0.3)	talheres (0.16) garfo (0.128571428571429) guardanapo (0.1) fome (0.04) açúcar (0.03) apetite (0.03) faca (0.03) morangos (0.03) prato (0.03) alma (0.01) chocolate (0.01) mãe (0.01) nada (0.01) ovos (0.01) papel (0.01) taça (0.01) tempo (0.01) trazido (0.01)
375	No verão a Cristina decidiu pintar a	casa (0.3)	parede (0.15) sala (0.1) cozinha (0.07) paisagem (0.03) tela (0.03) varanda (0.03) cara (0.02) garagem (0.02) janela (0.02) praia (0.02) amiga (0.01) andorinha (0.01) aquarela (0.01) arrecadação (0.01) avó (0.01) cadeira (0.01) cama (0.01) camisola (0.01) carrinha (0.01) dispensa (0.01) entrada (0.01) estante (0.01) estrada (0.01) filha (0.01) igreja (0.01) imagem (0.01) manta (0.01) mão (0.01) mesa (0.01) moldura (0.01) piscina (0.01) porta (0.01) prateleira (0.01) roupa (0.01)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
376	O pai disse-lhe para falar mais	alto (0.30)	baixo (0.28) devagar (0.22) rápido (0.04) vezes (0.04) depressa (0.03) pausadamente (0.03) comigo (0.01) confiadamente (0.01) lento (0.01)
377	O Henrique não foi correr por causa do	tempo (0.30)	joelho (0.09) pai (0.09) irmão (0.07) pé (0.07) cão (0.05) cansaço (0.05) amigo (0.04) acidente (0.02) desgaste (0.02) enjoo (0.02) filho (0.02) frio (0.02) furacão (0.02) jogo (0.02) piso (0.02) Ricardo (0.02) teste (0.02) tio (0.02) trabalho (0.02) treino (0.02) vento (0.02)
378	A Júlia assustou-se tanto que deu um	salto (0.30)	grito (0.28) pulo (0.17) berro (0.13) pum (0.04) encontrão (0.02) estalo (0.02) pontapé (0.02) soluço (0.02)
379	A Teresa não tem carro por isso anda sempre de	autocarro (0.30)	metro (0.22) bicicleta (0.16) comboio (0.16) mota (0.05) boleia (0.03) camioneta (0.03) táxi (0.03) transporte (0.03)
380	O Tomás ofereceu à namorada uma caixa de	chocolates (0.30)	bombons (0.19) joias (0.06) doces (0.05) flores (0.03) gomas (0.03) livros (0.03) morangos (0.03) rebuçados (0.03) sapatos (0.03) surpresas (0.03) amor (0.02) autocolantes (0.02) biscoitos (0.02) bolachas (0.02) bonecos (0.02) DVDs (0.02) fotografias (0.02) lápis (0.02) pensos (0.02) rosas (0.02) toalhas (0.02) vernizes (0.02)
381	A Juliana colocou todas as frutas naquele	cesto (0.30)	balde (0.09) prato (0.09) saco (0.09) recipiente (0.07) sítio (0.07) vaso (0.07) frasco (0.05) jarro (0.05) armário (0.02) envelope (0.02) lado (0.02) lugar (0.02) suporte (0.02) tupperware (0.02)
382	Nessa manhã estava tanto frio que teve de usar umas	luvas (0.30)	meias (0.28) botas (0.11) calças (0.11) collants (0.08) galochas (0.05) écharpes (0.02) polainas (0.02) perneiras (0.02) sandálias (0.02)
383	Para ajudar a combater o incêndio os bombeiros chamaram um	avião (0.29)	helicóptero (0.29) camião (0.18) bombeiro (0.12) ajudante (0.06) carro (0.06)
384	A Carla esteve toda a tarde a limpar a	casa (0.29)	cozinha (0.21) sala (0.21) cave (0.04) garagem (0.04) janela (0.04) rua (0.03) adega (0.01) agenda (0.01) casa-de-banho (0.01) estante (0.01) floresta (0.01) mesa (0.01) mochila (0.01) sujidade (0.01) varanda (0.01)
385	Como trabalho de casa a professora pediu para acabarem aquele	texto (0.29)	exercício (0.31) trabalho (0.08) livro (0.04) resumo (0.04) artigo (0.02) cálculo (0.02) desenho (0.02) documento (0.02) esquema (0.02) exame (0.02) excerto (0.02) problema (0.02) raciocínio (0.02) relatório (0.02) teste (0.02) TPC (0.02)
386	O Manuel vê sempre os jogos de futebol no	café (0.29)	computador (0.2) estádio (0.18) quarto (0.11) televisor (0.05) bar (0.03) tablet (0.03) cabeleireiro (0.02) canal (0.02) clube (0.02) jardim (0.02) restaurante (0.02) sofá (0.02) terraço (0.02)
387	A Tânia mostrou as fotografias que tinha guardadas no	computador (0.29)	telemóvel (0.26) álbum (0.16) quarto (0.08) tablet (0.03) CD (0.03) armário (0.02) bolso (0.02) caderno (0.02) carro (0.02) cartão (0.02) camiseiro (0.02) Ipad (0.02) portátil (0.02) telefone (0.02)
388	Como estava doente a Fernanda não foi à	escola (0.29)	aula (0.18) faculdade (0.11) festa (0.10) praia (0.03) reunião (0.03) viagem (0.03) actividade (0.02) biblioteca (0.02) consulta (0.02) feira (0.02) ioga (0.02) loja (0.02) manicure (0.02) marcação (0.02) mercearia (0.02) missa (0.02) natação (0.02) praxe (0.02) rua (0.02) visita (0.02)
389	O Frederico aprendeu uma nova música para tocar no	piano (0.29)	violino (0.15) baixo (0.08) violoncelo (0.08) clarinete (0.05) concerto (0.05) oboé (0.05) ensaio (0.03) saxofone (0.03) acordeão (0.02) auditório (0.02) café (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
			casamento (0.02) espetáculo (0.02) memorial (0.02) musical (0.02) órgão (0.02) recital (0.02) trabalho (0.02) trombone (0.02) xilofone (0.02)
390	A Vânia ia fazer um bolo mas reparou que não tinha	farinha (0.29)	ovos (0.25) açúcar (0.17) leite (0.07) fermento (0.06) manteiga (0.04) água (0.01) canela (0.01) chocolate (0.01) forno (0.01) ingredientes (0.01) iogurte (0.01) margarina (0.01) paciência (0.01)
391	O avô andava sempre no bolso com muitas	moedas (0.29)	chaves (0.16) notas (0.13) pastilhas (0.13) guloseimas (0.08) coisas (0.05) canetas (0.03) caricas (0.03) folhas (0.03) fotografias (0.03) peças (0.03) pedras (0.03)
392	Todas as noites a Mariana vê as	novelas (0.29)	estrelas (0.15) notícias (0.12) séries (0.12) amigas (0.08) irmãs (0.04) revistas (0.04) andorinhas (0.02) bonecas (0.02) contas (0.02) familiares (0.02) filhas (0.02) histórias (0.02) horas (0.02) pessoas (0.02) tias (0.02)
393	Ao entregar a carta reparou que se tinha esquecido do	selo (0.29)	envelope (0.17) nome (0.10) dinheiro (0.06) endereço (0.06) conteúdo (0.04) cartão (0.04) remetente (0.04) BI (0.02) código (0.02) comprovativo (0.02) destinatário (0.02) dia (0.02) documento (0.02) filho (0.02) lápis (0.02) papel (0.02) postal (0.02) talão (0.02)
394	O Mariano levou uma caixa de bombons para oferecer à sua	namorada (0.29)	mãe (0.24) amiga (0.12) professora (0.08) avó (0.08) irmã (0.05) esposa (0.03) mulher (0.03) amada (0.02) amante (0.02) parceira (0.02) tia (0.02)
395	A Joana decidiu pintar o seu	quarto (0.29)	cabelo (0.22) desenho (0.07) quadro (0.07) caderno (0.05) cão (0.03) carro (0.03) gato (0.03) retrato (0.03) armário (0.02) boneco (0.02) corpo (0.02) diário (0.02) escritório (0.02) lápis (0.02) livro (0.02) ovo (0.02) quarto (0.02) vestido (0.02)
396	A Mariana estava a escrever no seu	caderno (0.29)	diário (0.20) computador (0.17) telemóvel (0.12) livro (0.09) quarto (0.03) dossier (0.02) papel (0.02) portátil (0.02) portefólio (0.02) tablet (0.02) telefone (0.02) twitter (0.02)
397	A Rute queixava-se que nunca encontra nada na sua	mala (0.29)	casa (0.24) carteira (0.15) mochila (0.09) sala (0.05) vida (0.05) cozinha (0.03) gaveta (0.03) rua (0.03) aldeia (0.02) desarrumação (0.02) loja (0.02) terra (0.02)
398	Tiago costuma fazer yoga no	ginásio (0.29)	quarto (0.20) jardim (0.12) parque (0.09) centro (0.06) chão (0.05) tapete (0.05) pavilhão (0.03) carro (0.02) estacionamento (0.02) estúdio (0.02) inverno (0.02) quintal (0.02) salão (0.02) sofá (0.02) verão (0.02)
399	A Fernanda gosta muito de ler	livros (0.29)	romances (0.18) revistas (0.14) jornais (0.05) artigos (0.03) banda-desenhada (0.03) ficção (0.03) anúncios (0.02) bibliografia (0.02) clássicos (0.02) diários (0.02) fantasia (0.02) fanfiction (0.02) Kafka (0.02) manga (0.02) mistérios (0.02) Murakami (0.02) notícias (0.02) poemas (0.02) poesia (0.02) policiais (0.02) Saramago (0.02) terror (0.02) thrillers (0.02)
400	A Inês ofereceu um relógio ao seu	namorado (0.29)	pai (0.27) irmão (0.17) amigo (0.10) avô (0.08) primo (0.05) tio (0.05)
401	O Filipe teve de esperar uns minutos pelo próximo	comboio (0.29)	autocarro (0.29) metro (0.29) cliente (0.03) avião (0.02) barco (0.02) candidato (0.02) discurso (0.02) evento (0.02) táxi (0.02) telefonema (0.02)
402	A Teresa apontou o código no	caderno (0.29)	telemóvel (0.24) papel (0.11) livro (0.10) bloco (0.06) computador (0.06) braço (0.05) tablet (0.03) cérebro (0.02) manual (0.02) pulso (0.02) telefone (0.02)
403	O Guilherme cortou-se ao fazer a	barba (0.29)	comida (0.14) sopa (0.10) salada (0.10) apresentação (0.05) cama (0.05) carta (0.05) depilação (0.05) lasanha (0.05) lida (0.05) monda (0.05) pizza (0.05)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
404	A Teresa estava a comer o pudim com uma colher de	sopa (0.29)	sobremesa (0.25) pau (0.11) chá (0.09) café (0.05) metal (0.05) plástico (0.05) madeira (0.04) cobre (0.02) ferro (0.02) madeira (0.02) plástico (0.02)
405	A Beatriz decidiu ir ver a exposição da famosa	artista (0.29)	pintora (0.29) fotógrafa (0.10) escultora (0.10) cantora (0.06) Alexandrina (0.02) amiga (0.02) arquitecta (0.02) biblioteca (0.02) cidade (0.02) escritora (0.02) Lisboa (0.02) poeta (0.02)
406	A Joana não gosta da cor daquela	camisola (0.29)	saia (0.11) blusa (0.07) casa (0.07) mesa (0.07) parede (0.07) t-shirt (0.07) camisa (0.04) carteira (0.04) loja (0.04) flor (0.04) letra (0.04) pintura (0.04) roupa (0.04)
407	A Daniela não conseguia estudar porque estava cheia de	dores (0.29)	sono (0.16) fome (0.16) trabalho (0.06) alergias (0.04) febre (0.04) frio (0.04) medo (0.04) problemas (0.04) calor (0.02) cólicas (0.02) distrações (0.02) dúvidas (0.02) preocupações (0.02) sonhos (0.02)
408	O Manuel comprou aquele selo para a sua	carta (0.29)	namorada (0.14) colecção (0.13) mãe (0.13) amiga (0.05) encomenda (0.05) irmã (0.05) avó (0.02) caderneta (0.02) carteira (0.02) casa (0.02) correspondência (0.02) folha (0.02) mulher (0.02) prenda (0.02) prima (0.02)
409	O Francisco queria colocar na parede o	quadro (0.29)	poster (0.27) diploma (0.07) boneco (0.05) desenho (0.04) teste (0.04) candeeiro (0.02) cartão (0.02) cartaz (0.02) emblema (0.02) espelho (0.02) fio (0.02) horário (0.02) irmão (0.02) javali (0.02) pai (0.02) papel (0.02) prémio (0.02) relógio (0.02) retrato (0.02)
410	Enquanto preparava a comida a Sónia queimou a	mão (0.29)	carne (0.07) língua (0.07) massa (0.07) comida (0.05) panela (0.05) cozinha (0.04) roupa (0.04) toalha (0.04) alface (0.02) bancada (0.02) bifana (0.02) cara (0.02) colher (0.02) frigideira (0.02) lasanha (0.02) omelete (0.02) orelha (0.02) pano (0.02) pele (0.02) pestana (0.02) saia (0.02) testa (0.02) tigela (0.02) unha (0.02)
411	Para cobrir as costas a avó usava sempre um	xaile (0.28)	casaco (0.28) lenço (0.12) cachecol (0.08) cobertor (0.08) roupão (0.03) lençol (0.03) agasalho (0.02) avental (0.02) écharpe (0.02) robe (0.02) tapete (0.02)
412	Os alunos pediram ao professor para não marcar mais	trabalhos (0.28)	testes (0.25) faltas (0.19) exames (0.08) apresentações (0.06) aulas (0.06) frequências (0.04) castigos (0.02) fichas (0.02) presenças (0.02)
413	O Paulo foi jantar com os antigos colegas de	trabalho (0.28)	escola (0.17) faculdade (0.15) turma (0.09) casa (0.06) curso (0.06) quarto (0.04) escritório (0.02) ginásio (0.02) jogo (0.02) liceu (0.02) natação (0.02) praxe (0.02) secundário (0.02) treino (0.02)
414	O Guilherme ia sempre a todas as	aulas (0.28)	festas (0.23) palestras (0.06) actividades (0.04) conferências (0.04) praias (0.04) reuniões (0.04) semanas (0.04) audições (0.02) cadeiras (0.02) casas (0.02) cerimónias (0.02) competições (0.02) consultas (0.02) manhãs (0.02) missas (0.02) noites (0.02) quintas (0.02) sessões (0.02) tardes (0.02) vezes (0.02)
415	A Inês estava a pintar as	unhas (0.28)	paredes (0.28) folhas (0.19) telas (0.06) calças (0.03) figuras (0.03) flores (0.03) imagens (0.03) pálpebras (0.03) sobrancelhas (0.03)
416	A Mariana depois de tomar banho vestiu o	pijama (0.28)	vestido (0.22) casaco (0.13) robe (0.13) roupão (0.13) soutien (0.05) uniforme (0.03) agasalho (0.02) bódi (0.02) top (0.02)
417	Para sair da ilha tiveram de construir uma	jangada (0.28)	ponte (0.19) canoa (0.16) barca (0.06) armadilha (0.03) barraca (0.03) carruagem (0.03) casa (0.03) embarcação (0.03) estrada (0.03) fogueira (0.03) lancha (0.03) nau (0.03) rua (0.03)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
418	A Carlota queria viajar e conhecer novas	pessoas (0.28)	culturas (0.25) cidades (0.16) terras (0.05) amigas (0.03) experiências (0.03) paisagens (0.03) actividades (0.02) aldeias (0.02) casas (0.02) civilizações (0.02) coisas (0.02) espécies (0.02) línguas (0.02) paragens (0.02) ruas (0.02) vidas (0.02) vilas (0.02)
419	A mãe pediu-lhe para ir buscar a panela à	cozinha (0.28)	avó (0.12) loja (0.09) gaveta (0.07) tia (0.07) dispensa (0.05) prateleira (0.05) vizinha (0.05) casa (0.04) cozinha (0.04) sala (0.04) arrecadação (0.02) bancada (0.02) estante (0.02) garagem (0.02) mesa (0.02) prima (0.02)
420	O Samuel foi visitar o seu avô ao	lar (0.28)	hospital (0.21) jardim (0.09) parque (0.05) cemitério (0.04) centro (0.04) interior (0.04) aldeamento (0.02) asilo (0.02) bar (0.02) barco (0.02) café (0.02) Chile (0.02) consultório (0.02) cruzeiro (0.02) entardecer (0.02) hotel (0.02) Lumiar (0.02) Luxemburgo (0.02) norte (0.02) sótão (0.02) sul (0.02)
421	A estilista disse-lhes que tinham dois dias para acabarem os	vestidos (0.28)	trabalhos (0.2) desenhos (0.12) projectos (0.12) modelos (0.08) casacos (0.04) conjuntos (0.04) fatos (0.04) sapatos (0.04) treinos (0.04)
422	O Rodrigo deixou o carro na	rua (0.28)	garagem (0.24) estrada (0.16) faculdade (0.08) entrada (0.04) estação (0.04) fila (0.04) oficina (0.04) praia (0.04) sarjeta (0.04)
423	A Matilde escorregou quando estava a sair da	escola (0.28)	casa (0.2) sala (0.12) aula (0.08) actividade (0.04) água (0.04) cadeira (0.04) banheira (0.04) carrinha (0.04) festa (0.04) praia (0.04) prisão (0.04)
424	A Maria todos os sábados vai dançar para aquela	discoteca (0.28)	festa (0.12) feira (0.08) praia (0.08) zona (0.08) academia (0.04) aula (0.04) boate (0.04) casa (0.04) dança (0.04) escola (0.04) espelunca (0.04) praça (0.04) senhora (0.04)
425	O Tomás passa horas a jogar consola em casa do	amigo (0.28)	primo (0.10) João (0.10) irmão (0.07) Pedro (0.06) colega (0.04) pai (0.04) tio (0.04) avô (0.03) Miguel (0.03) vizinho (0.03) Alberto (0.01) António (0.01) companheiro (0.01) Diogo (0.01) padraço (0.01) Ricardo (0.01) Rúben (0.01) Rui (0.01) Samuel (0.01) Tiago (0.01) Vasco (0.01)
426	O pai quando cozinha usa sempre aquela	panela (0.28)	colher (0.15) faca (0.10) frigideira (0.10) especiaria (0.07) receita (0.05) tigela (0.05) bata (0.03) camisa (0.03) espátula (0.03) roupa (0.03) farda (0.02) manteiga (0.02) massa (0.02) mesa (0.02) toalha (0.02)
427	O Tiago estava muito cansado e adormeceu na	sala (0.28)	cama (0.15) aula (0.15) cadeira (0.09) mesa (0.06) banheira (0.04) cozinha (0.04) rua (0.04) cantina (0.02) tapete (0.02) cozinha (0.02) estação (0.02) sala (0.02) sombra (0.02) viatura (0.02)
428	A Filipa não gosta de chinelos prefere usar as suas	botas (0.28)	meias (0.21) pantufas (0.21) sandálias (0.21) alpargatas (0.03) sapatilhas (0.03) socas (0.03)
429	Os turistas decidiram sobrevoar a cidade de	Lisboa (0.28)	helicóptero (0.17) avião (0.14) Paris (0.10) Barcelona (0.07) avioneta (0.03) Berlim (0.03) dia (0.03) Londres (0.03) Milão (0.03) noite (0.03) Roma (0.03)
430	O menino pediu de presente de aniversário um	carro (0.28)	computador (0.10) avião (0.07) cão (0.07) jogo (0.07) telemóvel (0.07) bilhete (0.03) bolo (0.03) boneco (0.03) brinquedo (0.03) chocolate (0.03) lego (0.03) livro (0.03) puzzle (0.03) relógio (0.03) skate (0.03)
431	A estação de televisão enviou para a Síria um	repórter (0.275)	jornalista (0.275) aviso (0.08) documento (0.05) fotógrafo (0.05) recado (0.05) bilhete (0.03) casaco (0.03) comentador (0.03) empregado (0.03) entrevistado (0.03) enviado (0.03) homem (0.03) satélite (0.03) vídeo (0.03)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
432	A avó gosta de se sentar naquele	sofá (0.27)	banco (0.24) cadeirão (0.18) lugar (0.10) sítio (0.10) canto (0.03) jardim (0.03) baloiço (0.02) chão (0.02) degrau (0.02)
433	A Rita gosta de todas as bandas que vão tocar naquele	festival (0.27)	concerto (0.26) dia (0.13) evento (0.08) espetáculo (0.05) arraial (0.03) baile (0.03) bar (0.03) lugar (0.03) coliseu (0.02) mês (0.02) palco (0.02) recinto (0.02) sítio (0.02)
434	A professora disse-lhes para irem limpar as	mesas (0.27)	cadeiras (0.16) salas (0.11) mãos (0.10) janelas (0.08) almas (0.02) bancadas (0.02) bocas (0.02) botas (0.02) calças (0.02) caras (0.02) casas-de-banho (0.03) cortinas (0.02) escadas (0.02) estantes (0.02) gatas (0.02) paredes (0.03) ruas (0.02) secretárias (0.02) unhas (0.02)
435	O Afonso nas aulas fazia sempre muitas	perguntas (0.27)	asneiras (0.15) brincadeiras (0.06) questões (0.05) actividades (0.03) cábulas (0.03) interrupções (0.03) notas (0.03) queixas (0.03) piadas (0.03) traquinices (0.03) alergias (0.02) amizades (0.02) atrocidades (0.02) avarias (0.02) birras (0.02) conquistas (0.02) frases (0.02) interrupções (0.02) intervenções (0.02) palermice (0.02) palhaçadas (0.02) partidas (0.02) parvoíces (0.02) piadas (0.02) traulhices (0.02)
436	O Guilherme enoja sempre que anda de	carro (0.27)	avião (0.21) barco (0.18) comboio (0.14) autocarro (0.09) mota (0.05) carrocel (0.03) metro (0.02) patins (0.02)
437	O Tomé levou o cão a passear naquele	jardim (0.27)	parque (0.27) dia (0.18) estado (0.05) museu (0.05) quintal (0.05) Sábado (0.05) tarde (0.05) tempo (0.05)
438	O piloto avisou os passageiros que ia iniciar a	viagem (0.27)	descolagem (0.24) aterragem (0.2) descida (0.09) subida (0.04) marcha (0.04) partida (0.04) rota (0.04) máquina (0.02) queda (0.02) trajetória (0.02)
439	Os bombeiros salvaram o gato que estava preso na	árvore (0.27)	casa (0.18) janela (0.15) varanda (0.12) chaminé (0.06) camélia (0.03) escada (0.03) gaiola (0.03) laranjeira (0.03) mota (0.03) ponte (0.03) torre (0.03)
440	O Jaime estava ansioso para que chegassem as	férias (0.27)	notas (0.16) amigas (0.11) aulas (0.09) primas (0.07) classificações (0.04) encomendas (0.04) festas (0.04) tias (0.04) avós (0.02) bebidas (0.02) consolas (0.02) folhas (0.02) irmãs (0.02) novidades (0.02) palhetas (0.02) pausas (0.02)
441	O Filipe esqueceu-se de levar para o teste a	caneta (0.27)	calculadora (0.15) folha (0.10) borracha (0.08) lapiseira (0.07) régua (0.07) aula (0.05) escola (0.03) mãe (0.03) amiga (0.02) cabeça (0.02) cábula (0.02) ficha (0.02) mala (0.02) professora (0.02) sala (0.02) universidade (0.02)
442	Quando foi trabalhar a mãe deixou o bebé na	avó (0.27)	creche (0.19) escola (0.17) ama (0.15) cama (0.08) tia (0.04) cadeira (0.02) casa (0.02) cozinha (0.02) sala (0.02) secretária (0.02)
443	A mosca ficou presa numa	teia (0.27)	janela (0.19) rede (0.15) porta (0.06) armadilha (0.04) casa (0.04) chávena (0.02) cortina (0.02) folha (0.02) gaveta (0.02) lata (0.02) parede (0.02) pastilha (0.02) persiana (0.02) racha (0.02) raquete (0.02) ratoeira (0.02) sala (0.02)
444	A Filipa não conseguiu ir trabalhar porque estava cheia de	dores (0.27)	sono (0.19) fome (0.08) febre (0.06) cansaço (0.04) problemas (0.04) stress (0.04) trabalho (0.04) actividades (0.02) borbulhas (0.02) cólicas (0.02) complicações (0.02) consultas (0.02) diarreia (0.02) frio (0.02) medo (0.02) nervos (0.02) pressa (0.02) tosse (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
445	O António decidiu experimentar as suas novas	calças (0.27)	botas (0.19) camisolas (0.12) camisas (0.08) sapatilhas (0.08) caneleiras (0.04) chuteiras (0.04) luvas (0.04) meias (0.04) músicas (0.04) roupas (0.04) t-shirts (0.04)
446	O Tiago não gostava daquela praia por causa das	peessoas (0.27)	algas (0.12) ondas (0.12) rochas (0.12) marés (0.08) alforrecas (0.04) água (0.04) barracas (0.04) cores (0.04) correntes (0.04) moscas (0.04) palmeiras (0.04) pedras (0.04)
447	A família da Sara almoça sempre na	cozinha (0.27)	sala (0.27) cantina (0.15) rua (0.08) mesa (0.04) sala-de-jantar (0.04) casa (0.02) cidade (0.02) copa (0.02) Ericeira (0.02) escola (0.02) padaria (0.02) praia (0.02) taberna (0.02)
448	O Fernando foi estudar para a	biblioteca (0.27)	faculdade (0.17) sala (0.15) escola (0.13) cozinha (0.06) Alemanha (0.04) rua (0.04) América (0.02) cave (0.02) garagem (0.02) praia (0.02) Sória (0.02) Turquia (0.02) universidade (0.02)
449	O menino estava a chorar porque se magoou no	joelho (0.27)	pé (0.16) braço (0.15) dedo (0.09) cotovelo (0.07) ombro (0.06) calcanhar (0.03) parque (0.03) pescoço (0.03) tornozelo (0.03) coração (0.01) escorrega (0.01) queixo (0.01) rabo (0.01) recreio (0.01)
450	O Miguel andava a treinar para participar naquela	competição (0.27)	corrida (0.27) prova (0.15) maratona (0.12) actividade (0.02) audiência (0.02) aventura (0.02) cerimónia (0.02) equipa (0.02) gincana (0.02) luta (0.02) meta (0.02)
451	O Fernando prefere ir estudar para a	biblioteca (0.27)	sala (0.24) escola (0.12) cozinha (0.10) faculdade (0.05) secretária (0.05) cantina (0.02) casa (0.02) esplanada (0.02) praia (0.02) quarto (0.02) sótão (0.02) universidade (0.02)
452	Os índios atravessaram o rio com a sua	jangada (0.27)	canoa (0.2) lancha (0.13) caravela (0.07) comida (0.07) comunidade (0.07) família (0.07) força (0.07) invenção (0.07)
453	A avó antes de dormir vê sempre as	novelas (0.27)	notícias (0.15) estrelas (0.12) netas (0.07) horas (0.05) flores (0.05) amigas (0.03) luzes (0.03) séries (0.03) plantas (0.03) chamadas (0.02) contas (0.02) revistas (0.02) filhas (0.02) janelas (0.02) bonecas (0.02) irmãs (0.02) pastilhas (0.02) pegadas (0.02) portas (0.02)
454	O Eduardo estava ansioso para ir ver aquele	filme (0.27)	concerto (0.16) espetáculo (0.16) jogo (0.09) teatro (0.06) amigo (0.03) artista (0.03) musical (0.03) actor (0.02) anúncio (0.02) circo (0.02) comediante (0.02) documentário (0.02) escritor (0.02) evento (0.02) jardim (0.02) músico (0.02) torneio (0.02) treino (0.02)
455	A Lara estava tão feliz por receber aquele anel de	noivado (0.27)	diamantes (0.14) ouro (0.11) prata (0.11) casamento (0.08) amizade (0.03) brilhantes (0.03) compromisso (0.03) namoro (0.03) alguém (0.02) ametista (0.02) aniversário (0.02) comprometida (0.02) curso (0.02) esmeralda (0.02) formatura (0.02) pedras (0.02) pérolas (0.02) princesa (0.02) rubi (0.02)
456	A menina disse ao pai que não gostava de nenhuma menina daquela	turma (0.27)	escola (0.20) sala (0.14) aula (0.10) classe (0.06) cor (0.04) festa (0.04) idade (0.04) altura (0.02) cidade (0.02) faculdade (0.02) vila (0.02) zona (0.02)
457	O Pedro decidiu fazer uma tatuagem no	braço (0.26)	ombro (0.16) pescoço (0.13) pé (0.12) peito (0.09) cotovelo (0.04) joelho (0.04) rabo (0.04) dedo (0.03) tornozelo (0.03) calcanhar (0.01) corpo (0.01) lábio (0.01)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
458	O José chegou atrasado ao trabalho por causa do	trânsito (0.26)	filho (0.13) autocarro (0.09) acidente (0.06) cão (0.06) comboio (0.06) metro (0.06) tempo (0.04) avião (0.03) despertador (0.03) irmão (0.03) tempo (0.03) barco (0.01) carro (0.01) frio (0.01) gato (0.01) João (0.01) pai (0.01) tempo (0.01) temporal (0.01)
459	No natal a avó recebe sempre uma caixinha de	chocolates (0.26)	bombons (0.09) doces (0.06) joias (0.06) presentes (0.06) bolos (0.03) brincos (0.03) bonecos (0.03) charutos (0.03) gomas (0.03) laços (0.03) meias (0.03) ouro (0.03) pastilhas (0.03) perfumes (0.03) prenda (0.03) roupa (0.03) rebuçados (0.03) sabonete (0.03) vernizes (0.03) whisky (0.03)
460	Depois de marcar a viagem ainda tinham de reservar o	hotel (0.26)	lugar (0.13) bilhete (0.11) quarto (0.11) carro (0.07) restaurante (0.05) transporte (0.05) voo (0.05) barco (0.03) alojamento (0.02) autocarro (0.02) avião (0.02) hostel (0.02) jantar (0.02) jato (0.02) motel (0.02) salão (0.02)
461	A Teresa só viu que havia greve quando chegou ao	metro (0.26)	autocarro (0.22) comboio (0.22) trabalho (0.17) local (0.09) departamento (0.04)
462	A igreja já estava preparada para a	cerimónia (0.26)	missa (0.24) festa (0.16) comunhão (0.06) eucaristia (0.04) ocasião (0.04) onda (0.02) bruxa (0.02) catequese (0.02) celebração (0.02) excluir (0.02) freira (0.02) oração (0.02) receber (0.02) reza (0.02) vigília (0.02)
463	No batizado os padrinhos ofereceram uma pulseira de	prata (0.26)	ouro (0.22) batismo (0.15) cobre (0.07) diamantes (0.07) amizade (0.04) amor (0.04) casamento (0.04) Pandora (0.04) pérolas (0.04) recordação (0.04)
464	A senhora pediu um galão e uma	torrada (0.26)	sandes (0.16) tosta (0.16) água (0.07) bolacha (0.05) fatia (0.03) merenda (0.03) pastilha (0.03) queijada (0.03) broa (0.02) chapada (0.02) doce (0.02) empada (0.02) factura (0.02) francesinha (0.02) maçã (0.02) margarida (0.02) pão (0.02) torta (0.02)
465	O cirurgião tentou tudo para salvar aquele	paciente (0.26)	doente (0.18) rapaz (0.13) homem (0.11) menino (0.08) senhor (0.08) miúdo (0.05) indivíduo (0.03) órgão (0.03) amigo (0.02) animal (0.02) cidadão (0.02)
466	O polícia disse-lhes que iam começar uma caça ao	ladrão (0.26)	homem (0.19) tesouro (0.13) criminoso (0.10) bandido (0.06) fugitivo (0.06) assassino (0.03) bairro (0.03) ganso (0.03) local (0.03) suspeito (0.03) vizinho (0.03)
467	A Francisca estava a aprender a tocar	piano (0.26)	guitarra (0.2) violino (0.17) flauta (0.09) bateria (0.06) clarinete (0.04) saxofone (0.03) viola (0.03) trompete (0.03) baixo (0.01) harpa (0.01) instrumentos (0.01) músicas (0.01) trompete (0.01) tuba (0.01) violoncelo (0.01)
468	A mãe pediu-lhe para ir buscar pão à	padaria (0.26)	loja (0.21) mercearia (0.21) rua (0.09) vizinha (0.09) cozinha (0.04) Amélia (0.02) baixa (0.02) mesa (0.02) pastelaria (0.02) sala (0.02)
469	O chefe chamou-o ao final do dia para anunciar a sua	promoção (0.26)	demissão (0.13) decisão (0.09) despedida (0.09) partida (0.04) novidade (0.04) reforma (0.04) saída (0.04) colocação (0.02) competência (0.02) dispensa (0.02) falha (0.02) felicidade (0.02) festa (0.02) função (0.02) ida (0.02) invenção (0.02) nomeação (0.02) tarefa (0.02) transferência (0.02) vitória (0.02)
470	A Mónica não conseguia colocar mais plantas na sua	varanda (0.25)	casa (0.22) cozinha (0.12) janela (0.08) estufa (0.06) sala (0.06) jarra (0.04) quinta (0.04) escadaria (0.02) garagem (0.02) marquise (0.02) piscina (0.02) plantação (0.02) prateleira (0.02) vedação (0.02)
471	Os meninos iam todos os dias de autocarro para o	colégio (0.25)	jardim (0.07) treino (0.07) infantário (0.05) metro (0.05) trabalho (0.05) centro (0.04) comboio (0.04) futebol (0.04) liceu (0.04) recinto (0.04) parque (0.04) avô

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
			(0.02) ATL (0.02) baile (0.02) campo (0.02) encontro (0.02) estabelecimento (0.02) estádio (0.02) jogo (0.02) pavilhão (0.02) recreio (0.02) refeitório (0.02) Shopping (0.02)
472	A impressora não imprimiu porque não tinha	tinta (0.25)	papel (0.24) tinteiro (0.22) folhas (0.12) bateria (0.05) electricidade (0.03) energia (0.03) cor (0.02) funcionalidades (0.02) toner (0.02)
473	As crianças estavam a brincar à apanhada no	jardim (0.25)	recreio (0.19) parque (0.14) pátio (0.13) quintal (0.10) intervalo (0.03) orfanato (0.03) armazém (0.02) átrio (0.02) bairro (0.02) bosque (0.02) corredor (0.02) hospital (0.02) paredão (0.02) quarto (0.02)
474	Depois da caminhada viu que tinha as sapatilhas cheias de	lama (0.25)	terra (0.24) sujidade (0.12) areia (0.06) relva (0.06) pastilha (0.04) pó (0.04) água (0.03) buracos (0.03) erva (0.03) borracha (0.01) confettis (0.01) lixo (0.01) impurezas (0.01) teias (0.01) tinta (0.01)
475	A Soraia nem acredita que conseguiu um autógrafo daquele	cantor (0.25)	actor (0.21) escritor (0.12) artista (0.10) famoso (0.06) pintor (0.04) futebolista (0.03) homem (0.03) músico (0.03) atleta (0.01) autor (0.01) herói (0.01) idolo (0.01) jogador (0.01) modelo (0.01) professor (0.01) rapaz (0.01)
476	A princesa nessa noite usou o seu novo anel de	noivado (0.25)	diamantes (0.18) ouro (0.18) prata (0.11) rubi (0.11) princesa (0.07) casada (0.04) casamento (0.04) esmeralda (0.04)
477	A Mafalda estava nervosa porque tinha de fazer uma apresentação na	aula (0.25)	escola (0.18) faculdade (0.11) quinta (0.11) segunda (0.11) quarta (0.07) sexta (0.09) sala (0.05) terça (0.02)
478	A menina tinha medo de ir falar com aquele	rapaz (0.25)	professor (0.18) senhor (0.18) homem (0.14) menino (0.07) colega (0.04) gajo (0.04) jovem (0.04) monstro (0.04) segurança (0.04)
479	O maestro corrigiu o músico que estava a tocar o	piano (0.25)	violino (0.25) violoncelo (0.13) saxofone (0.08) trompete (0.08) bombo (0.04) clarinete (0.04) contrabaixo (0.04) instrumento (0.04) trombone (0.04)
480	A mãe pediu ao Tomás para arrumar a	cozinha (0.25)	casa (0.23) sala (0.23) mesa (0.05) secretária (0.05) bancada (0.03) cama (0.03) estante (0.03) lancheira (0.03) garagem (0.03) prateleira (0.03) roupa (0.03) toalha (0.03)
481	O menino tem medo de ir ao	dentista (0.25)	médico (0.19) circo (0.11) parque (0.08) cinema (0.06) hospital (0.06) sótão (0.06) cabeleireiro (0.03) colégio (0.03) jardim (0.03) oceanário (0.03) psiquiatra (0.03) quadro (0.03) teatro (0.03)
482	O Frederico colocou o pão que tinha acabado de comprar no	saco (0.25)	cesto (0.17) bolso (0.08) carro (0.08) armário (0.04) café (0.04) congelador (0.04) frigorífico (0.04) lixo (0.04) mercado (0.04) prato (0.04) restaurante (0.04) shopping (0.04) tabuleiro (0.04)
483	A avó vai sempre ao mercado comprar os	legumes (0.25)	alimentos (0.11) doces (0.11) almoços (0.07) ovos (0.07) vegetais (0.07) acessórios (0.04) bolos (0.04) frutos (0.04) ingredientes (0.04) jornais (0.04) pães (0.04) peixes (0.04) sapatos (0.04) tomates (0.04)
484	Na festa de aniversário o menino comeu muitas	gomas (0.25)	guloseimas (0.23) porcarias (0.08) bolachas (0.06) pipocas (0.06) batatas (0.04) coisas (0.04) fatias (0.04) sandes (0.04) sobremesas (0.04) areias (0.02) barras (0.02) frutas (0.02) gulodices (0.02) tortas (0.02)
485	O menino não conseguia ler as	palavras (0.25)	letras (0.2) frases (0.15) histórias (0.08) cartas (0.03) coisas (0.03) folhas (0.03) indicações (0.03) instruções (0.03) legendas (0.03) perguntas (0.03) planilhas

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
			(0.03) recomendações (0.03) respostas (0.03) sílabas (0.03) tabuletas (0.03) tarefas (0.03)
486	O Francisco colocou o livro na	prateleira (0.25)	estante (0.22) mesa (0.12) mochila (0.09) biblioteca (0.07) mala (0.07) secretária (0.06) gaveta (0.03) pasta (0.03) sala (0.03) cadeira (0.01) cozinha (0.01) janela (0.01)
487	Ele abriu a janela de manhã e viu que estava muito	frio (0.25)	sol (0.21) calor (0.19) vento (0.11) nublado (0.09) nevoeiro (0.07) escuro (0.04) chuvoso (0.04) enovoadado (0.02)
488	A última pergunta do teste pedia para escreverem uma	composição (0.25)	frase (0.16) palavra (0.140350877192982) resposta (0.07) carta (0.05) ideia (0.04) redação (0.04) análise (0.02) canção (0.02) citação (0.02) conclusão (0.02) crítica (0.02) dissertação (0.02) entrevista (0.02) espera (0.02) expressão (0.02) fórmula (0.02) história (0.02) opinião (0.02) questão (0.02) reflexão (0.02) tese (0.02)
489	O Vítor no jogo de futebol com os amigos magoou-se no	joelho (0.25)	pé (0.25) braço (0.11) dedo (0.11) tornozelo (0.11) ombro (0.09) rabo (0.04) pulso (0.02) queixo (0.02)
490	A mãe pediu-lhe para ir buscar a roupa que estava na	lavandaria (0.25)	máquina (0.17) varanda (0.11) sala (0.09) cama (0.08) rua (0.08) cozinha (0.04) mesa (0.04) cadeira (0.02) corda (0.02) dispensa (0.02) estendal (0.02) garagem (0.02) janela (0.02) tia (0.02) vizinha (0.02)
491	O Luís quando cozinha usa sempre aquele	avental (0.24)	tacho (0.18) garfo (0.07) fogão (0.04) forno (0.04) método (0.04) sal (0.04) talher (0.04) tempero (0.04) utensílio (0.04) açafraão (0.02) arroz (0.02) azeite (0.02) chapéu (0.02) condimento (0.02) ingrediente (0.02) livro (0.02) óleo (0.02) recheio (0.02)
492	O Rafael estava contente por ter ganho aquele	prémio (0.24)	concurso (0.15) jogo (0.09) presente (0.06) amigo (0.03) brinquedo (0.03) cão (0.03) carro (0.03) cartão (0.03) debate (0.03) desafio (0.03) dicionário (0.03) diploma (0.03) livro (0.03) sorteio (0.03) tênis (0.03) telemóvel (0.03) torneio (0.03) trabalho (0.03)
493	A mãe disse-lhe para colocar o livro na	estante (0.24)	prateleira (0.225806451612903) mesa (0.15) mochila (0.08) mala (0.06) sala (0.05) cama (0.03) cómoda (0.03) secretária (0.03) bancada (0.02) biblioteca (0.02) cozinha (0.02) dispensa (0.02) mão (0.02) secretária (0.02)
494	O André queria andar na pista de gelo mas não havia mais	patins (0.24)	espaço (0.14) bilhetes (0.10) gelo (0.10) dinheiro (0.07) sapatos (0.07) tempo (0.07) vagas (0.07) botas (0.03) meias (0.03) ninguém (0.03) pista (0.03)
495	O menino não tinha muita fome por isso lanchou só um	pão (0.24)	bolo (0.16) iogurte (0.16) café (0.12) leite (0.08) burrito (0.04) chocolate (0.04) folhado (0.04) hambúrguer (0.04) queijo (0.04) sumo (0.04)
496	Para resolver o exercício o Afonso pediu ajuda ao	professor (0.24)	amigo (0.18) pai (0.16) colega (0.14) irmão (0.08) avô (0.04) explicador (0.04) João (0.04) Frederico (0.02) primo (0.02) Pedro (0.02) tio (0.02)
497	A mãe pediu-lhe para arrumar os seus	brinquedos (0.24)	livros (0.22) sapatos (0.12) pertences (0.08) cadernos (0.06) jogos (0.04) acessórios (0.02) apontamentos (0.02) cds (0.02) desenhos (0.02) deveres (0.02) materiais (0.02) objectos (0.02) peluches (0.02) pratos (0.02) recortes (0.02) soutiens (0.02) utensílios (0.02)
498	A câmara municipal convidou várias bandas para tocarem no	festival (0.24)	concerto (0.22) evento (0.09) coreto (0.04) espectáculo (0.04) arraial (0.02) átrio (0.02) baile (0.02) bar (0.02) café (0.02) campo (0.02) coliseu (0.02) congresso

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
			(0.02) dia (0.02) edifício (0.02) jardim (0.02) município (0.02) musical (0.02) palco (0.02) parque (0.02) pátio (0.02) teatro (0.02)
499	A avó dá sempre ao neto um pacote de	bolachas (0.24)	gomas (0.19) rebuçados (0.12) chocolates (0.12) doces (0.10) batatas (0.07) bombons (0.03) leite (0.03) pastilhas (0.03) amendoins (0.02) bolos (0.02) pipocas (0.02) sumo (0.02)
500	Quando abriu a mochila viu que se tinha esquecido do	caderno (0.24)	estojo (0.16) livro (0.13) computador (0.11) telemóvel (0.11) passe (0.07) lápis (0.05) dinheiro (0.04) cartão (0.04) lanche (0.02) papel (0.02) termo (0.02)
501	O Gabriel guardou as notas no	bolso (0.24)	casaco (0.13) quarto (0.09) caderno (0.07) banco (0.05) cofre (0.05) computador (0.05) telemóvel (0.05) armário (0.04) carro (0.04) saco (0.04) tablet (0.04) arquivo (0.02) colchão (0.02) fato (0.02) livro (0.02) mealheiro (0.02) porta-moedas (0.02)
502	A Maria estava contente por ter entrado naquela	faculdade (0.24)	escola (0.21) casa (0.09) loja (0.09) turma (0.09) porta (0.06) universidade (0.06) aula (0.03) empresa (0.03) fase (0.03) mansão (0.03) sala (0.03) viagem (0.03)
503	O João estava tão cansado que adormeceu no	sofá (0.234375)	carro (0.14) comboio (0.11) chão (0.09) autocarro (0.08) escritório (0.06) trabalho (0.05) jardim (0.03) refeitório (0.03) auditório (0.02) avião (0.02) banco (0.02) bar (0.02) café (0.02) colo (0.02) corredor (0.02) metro (0.02) quarto (0.02) restaurante (0.02) trabalho (0.02)
504	O Simão tinha uma pequena marca de nascença no	pescoço (0.23)	braço (0.17) olho (0.13) nariz (0.1) joelho (0.07) ombro (0.07) peito (0.07) cotovelo (0.03) dedo (0.03) pé (0.03) pulso (0.03) umbigo (0.03)
505	Os escuteiros estavam a organizar mais um	evento (0.23)	acampamento (0.13) encontro (0.1) jogo (0.1) concurso (0.07) jantar (0.07) passeio (0.07) baile (0.03) cabaz (0.03) campeonato (0.03) convívio (0.03) estágio (0.03) programa (0.03) treino (0.03)
506	Como estava a chover o Carlos foi buscar as suas	botas (0.23)	galochas (0.18) roupas (0.11) luvas (0.07) coisas (0.05) irmãs (0.05) malas (0.05) chaves (0.04) filhas (0.04) gabardines (0.04) meias (0.04) amigas (0.02) cadelas (0.02) calças (0.02) camisolas (0.02) protecções (0.02) sapatilhas (0.02)
507	A mãe disse-lhe para estender a roupa na	cozinha (0.23)	rua (0.23) sala (0.19) varanda (0.19) marquise (0.08) corda (0.04) garagem (0.04)
508	A Raquel queria vestir a sua nova	camisola (0.23)	saia (0.19) camisa (0.15) roupa (0.15) blusa (0.13) t-shirt (0.10) cadela (0.02) gabardine (0.02)
509	A Helena foi buscar algumas frutas frescas ao	supermercado (0.23)	mercado (0.15) frigorífico (0.10) jardim (0.10) quintal (0.10) avô (0.05) almoço (0.04) bosque (0.04) horto (0.04) madeirense (0.04) minimercado (0.04) pomar (0.04) saco (0.04) shopping (0.04) terraço (0.04) vizinho (0.04)
510	Os pais decidiram que naquele passeio iriam visitar um	museu (0.23)	amigo (0.17) familiar (0.10) café (0.06) monumento (0.06) castelo (0.04) conhecido (0.04) jardim (0.04) palácio (0.04) parque (0.04) vizinho (0.04) colega (0.02) estádio (0.02) laboratório (0.02) local (0.02) parente (0.02) professor (0.02) rio (0.02) zoo (0.02)
511	A noiva não gostou muito daquele	vestido (0.23)	bolo (0.13) anel (0.12) convidado (0.06) noivo (0.06) bouquet (0.04) jantar (0.04) presente (0.04) ambiente (0.02) arranjo (0.02) champanhe (0.02) comentário (0.02) comportamento (0.02) gesto (0.02) investimento (0.02) momento (0.02) notícia (0.02) padrinho (0.02) prato (0.02) rapaz (0.02) restaurante (0.02) sapato (0.02) sogro (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
512	Os filmes preferidos da Amélia são os	românticos (0.23)	assustadores (0.08) clássicos (0.05) cómicos (0.05) dramáticos (0.05) engraçados (0.05) franceses (0.05) romances (0.05) americanos (0.04) animados (0.04) antigos (0.04) científicos (0.04) documentários (0.04) dramas (0.04) ingleses (0.04) jogos (0.04) melhores (0.04) musicais (0.04) novos (0.04) piores (0.04) thrillers (0.04) tristes (0.04) Western (0.04)
513	O Bernardo convidou-a para ir ao	cinema (0.23)	café (0.11) restaurante (0.08) baile (0.07) bar (0.07) festival (0.05) parque (0.05) teatro (0.05) concerto (0.03) evento (0.03) jantar (0.03) jardim (0.03) museu (0.03) Porto (0.03) teatro (0.03) arraial (0.02) espectáculo (0.02) Shopping (0.02) supermercado (0.02)
514	O alpinista teve de ser resgatado de	helicóptero (0.23)	avião (0.14) barco (0.14) emergência (0.14) imediato (0.14) urgência (0.09) ambulância (0.05) carro (0.05) navio (0.05)
515	A Maria só gosta do bacalhau daquele	restaurante (0.23)	sítio (0.14) salgado (0.09) tio (0.09) assado (0.05) café (0.05) congelado (0.05) cozido (0.05) cozinheiro (0.05) homem (0.05) mercado (0.05) sabor (0.05) senhor (0.05) tipo (0.05)
516	A garagem era tão pequena que só cabia uma	mota (0.23)	bicicleta (0.20) pessoa (0.14) carrinha (0.05) mesa (0.05) trotinete (0.05) viatura (0.05) caixa (0.02) camioneta (0.02) estante (0.02) folha (0.02) formiga (0.02) lanterna (0.02) mala (0.02) perna (0.02) pessoa (0.02) prancha (0.02) vassoura (0.02)
517	A mãe proibiu a menina de comer as	batatas (0.23)	bolachas (0.16) gomas (0.16) maçãs (0.10) guloseimas (0.06) bolotas (0.03) chocolates (0.03) entradas (0.03) laranjas (0.03) pastilhas (0.03) pipocas (0.03) pedras (0.03) peras (0.03) sobremesas (0.03)
518	As vitaminas eram tão coloridas e viscosas que pareciam	doces (0.22)	gomas (0.22) smarties (0.17) gelatina (0.11) boas (0.06) estranhas (0.06) lesmas (0.06) más (0.06) rebuçados (0.06)
519	A menina ao fazer o desenho pintou também um	dedo (0.22)	sol (0.17) cão (0.11) banco (0.06) café (0.06) céu (0.06) gato (0.06) girassol (0.06) livro (0.06) menino (0.06) pássaro (0.06) pinto (0.06)
520	O músico sabe tocar contrabaixo e também	guitarra (0.22)	piano (0.22) violino (0.11) bateria (0.08) clarinete (0.08) saxofone (0.08) baixo (0.06) flauta (0.03) oboé (0.03) tambor (0.03) viola (0.03) violoncelo (0.03)
521	A avó estava a aquecer a comida naquela	panela (0.22)	tarde (0.11) cozinha (0.07) hora (0.07) noite (0.07) tijela (0.07) altura (0.04) casa (0.04) fogão (0.04) frigideira (0.04) hora (0.04) manhã (0.04) taça (0.04) travessa (0.04) tupperware (0.04) zona (0.04)
522	Os avós todos os domingos davam um	almoço (0.22)	jantar (0.16) passeio (0.14) beijo (0.06) abraço (0.05) lanche (0.06) bolo (0.05) presente (0.05) banquete (0.03) chocolate (0.03) concerto (0.02) convívio (0.02) doce (0.02) espetáculo (0.02) euro (0.02) lanche (0.02) pão (0.02) pulo (0.02) rebuçado (0.02)
523	Os alpinistas foram resgatados por um	helicóptero (0.22)	bombeiro (0.11) homem (0.11) avião (0.11) cão (0.07) amigo (0.04) bombeiro (0.04) salvador (0.04) caçador (0.02) civil (0.02) colega (0.02) desconhecido (0.02) eremita (0.02) médico (0.02) pescador (0.02) piloto (0.02) polícia (0.02) senhor (0.02) socorrista (0.02)
524	O neto ajudou a avó a abrir o frasco de	compota (0.22)	mel (0.09) geleia (0.07) doce (0.06) manteiga (0.06) salsichas (0.06) açúcar (0.04) amendoim (0.04) azeitonas (0.04) feijão (0.04) morangos (0.04) pickles (0.04)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
			bolachas (0.02) chocolate (0.02) cola (0.02) creme (0.02) leite (0.02) maionese (0.02) marmelada (0.02) milho (0.02) óleo (0.02) orégãos (0.02) pepinos (0.02) sumo (0.02)
525	No jogo de andebol o Rui deslocou o	ombro (0.22)	joelho (0.19) braço (0.15) pulso (0.15) pé (0.07) cotovelo (0.03) dedo (0.03) pescoço (0.03) tendão (0.03) tornozelo (0.03) adversário (0.02) fémur (0.02) osso (0.02)
526	A avó do Henrique nunca andou de	avião (0.22)	carro (0.22) bicicleta (0.19) barco (0.16) mota (0.13) autocarro (0.03) comboio (0.03) metro (0.03)
527	Quando chegou ao aeroporto reparou que se tinha esquecido do	passaporte (0.22)	telemóvel (0.13) bilhete (0.10) casaco (0.09) chapéu (0.06) cartão (0.04) saco (0.04) cachecol (0.04) cartão (0.04) computador (0.04) livro (0.04) tabaco (0.04) bilhete de identidade (0.01) candeeiro (0.01) carro (0.01) dinheiro (0.01) documento (0.01) estojo (0.01) filho (0.01) guarda-sol (0.01) irmão (0.01) mapa (0.01) marido (0.01) namorado (0.01) relógio (0.01) roupão (0.01) telefone (0.01)
528	O atleta estava furioso porque tinham perdido o	jogo (0.22)	campeonato (0.17) autocarro (0.04) combate (0.04) concurso (0.04) pódio (0.04) prémio (0.04) adversário (0.02) colete (0.02) combate (0.02) comboio (0.02) competição (0.02) desafio (0.02) entusiasmo (0.02) equipamento (0.02) espírito (0.02) folgo (0.02) lugar (0.02) namorado (0.02) ouro (0.02) sapato (0.02) telemóvel (0.02) torneio (0.02) treino (0.02) trofeu (0.02)
529	Quando olhou para a praia viu um conjunto de	peessoas (0.22)	conchas (0.14) gaiotas (0.11) barcos (0.08) crianças (0.05) peixes (0.05) alforrecas (0.03) amigos (0.03) bolas (0.03) chapéus (0.03) gente (0.03) lixo (0.03) miúdos (0.03) ondas (0.03) pombos (0.03) redes (0.03) rochas (0.03) surfistas (0.03) toalhas (0.03)
530	O trolha despejou rapidamente toda a massa do	cimento (0.21)	almoço (0.14) jantar (0.14) barco (0.07) contentor (0.07) lanche (0.07) navio (0.07) prato (0.07) tabuleiro (0.07) trabalho (0.07)
531	O Luís estava em casa à espera que entregassem as	pizzas (0.21)	compras (0.14) encomendas (0.14) cartas (0.07) coisas (0.07) prendas (0.07) chaves (0.04) flores (0.04) fotocópias (0.04) fotografias (0.04) garrafas (0.04) mercearias (0.04) prateleira (0.04) tarefas (0.04)
532	A Madalena acordou a meio da noite por causa dos	barulhos (0.21)	pesadelos (0.14) cães (0.11) irmãos (0.07) sonhos (0.07) filhos (0.04) enjoo (0.04) ladrões (0.04) mosquitos (0.04) pais (0.04) pés (0.04) ruídos (0.04) sons (0.04) trovões (0.04) terramotos (0.04) vizinhos (0.04)
533	Os ladrões pensavam que aquela casa não tinha	alarme (0.21)	ninguém (0.16) pessoas (0.10) cães (0.07) nada (0.07) dinheiro (0.05) segurança (0.05) bens (0.03) ouro (0.03) animais (0.02) câmara (0.02) computador (0.02) empregada (0.02) fechadura (0.02) garagem (0.02) gente (0.02) joias (0.02) luz (0.02) polícia (0.02) porta (0.02) tranca (0.02) valor (0.02) vigilância (0.02)
534	O pior naquele prédio era ter tantas	peessoas (0.21)	escadas (0.19) janelas (0.13) portas (0.09) casas (0.04) rachas (0.04) vizinhas (0.04) aranhas (0.02) árvores (0.02) bandas (0.02) baratas (0.02) ciganas (0.02) coisas (0.02) cores (0.02) famílias (0.02) fugas (0.02) mesas (0.02) mulheres (0.02) pragas (0.02)
535	A Manuela comprou novos cadernos para as suas	aulas (0.21)	disciplinas (0.15) amigas (0.13) cadeiras (0.06) filhas (0.06) notas (0.04) sobrinhas (0.04) alunas (0.02) colegas (0.02) colecções (0.02) composições (0.02) frases

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
			(0.02) histórias (0.02) ideias (0.02) irmãs (0.02) músicas (0.02) netas (0.02) organizações (0.02) plantas (0.02) receitas (0.02) tarefas (0.02)
536	O Tomé foi passear com a namorada para o	jardim (0.21)	parque (0.21) rio (0.09) lago (0.06) museu (0.06) bar (0.03) Brasil (0.03) campo (0.03) cemitério (0.03) centro (0.03) centro comercial (0.03) céu (0.03) mar (0.03) pátio (0.03) Shopping (0.03) Tejo (0.03) Terreiro (0.03)
537	A mãe dava sempre o leite ao filho naquele	copo (0.21)	dia (0.12) biberão (0.09) momento (0.06) quarto (0.06) sítio (0.06) banco (0.03) caneca (0.03) espaço (0.03) horário (0.03) jardim (0.03) lugar (0.03) mês (0.03) metro (0.03) peito (0.03) pijama (0.03) prato (0.03) quarto (0.03) tempo (0.03)
538	O Júlio estava a dar comida aos	cães (0.21)	gatos (0.19) pássaros (0.15) pombos (0.12) animais (0.06) pobres (0.06) irmãos (0.04) amigos (0.02) avós (0.02) cavalos (0.02) escravos (0.02) filhos (0.02) patos (0.02) peixes (0.02) porcos (0.02) tios (0.02)
539	A avó moeu os grãos de café e colocou-os na	máquina (0.21)	cafeteira (0.17) chávena (0.13) caixa (0.08) caneca (0.08) tigela (0.08) embalagem (0.04) jarra (0.04) mesa (0.04) planta (0.04) prateleira (0.04) sopa (0.04)
540	O avô do Rui já vivia há muito tempo naquele	lugar (0.21)	apartamento (0.08) bosque (0.08) lar (0.08) local (0.08) prédio (0.08) sítio (0.08) bairro (0.04) casarão (0.04) cidade (0.04) curral (0.04) jardim (0.04) país (0.04) palácio (0.04)
541	O Rafael deu um pouco mais de água aos	gatos (0.21)	cães (0.17) pássaros (0.13) amigos (0.09) animais (0.08) miúdos (0.04) pobres (0.04) avós (0.02) gatos (0.02) cavalos (0.02) coelhos (0.02) concorrentes (0.02) filhos (0.02) jogadores (0.02) meninos (0.02) pais (0.02) patos (0.02) peixes (0.02) pombos (0.02) porquinhos (0.02)
542	Na viagem à Tunísia andou pela primeira vez num	barco (0.21)	avião (0.19) camelo (0.14) comboio (0.09) carro (0.09) autocarro (0.05) táxi (0.05) carrossel (0.03) tuc-tuc (0.03) balão (0.02) cavalo (0.02) dromedário (0.02) elefante (0.02) helicóptero (0.02) metro (0.02) triciclo (0.02)
543	A menina não gostou muito de receber aquele	presente (0.21)	anel (0.07) cartão (0.07) convite (0.07) estojo (0.07) abraço (0.03) aviso (0.03) brinquedo (0.03) casaco (0.03) colar (0.03) elogio (0.03) fio (0.03) nove (0.03) pedido (0.03) piropo (0.03) pijama (0.03) postal (0.03) recado (0.03) telefonema (0.03) vestido (0.03)
544	Todos os anos os escuteiros organizavam um	acampamento (0.20)	evento (0.18) encontro (0.11) passeio (0.11) convívio (0.09) arraial (0.05) churrasco (0.05) festival (0.05) jantar (0.05) almoço (0.02) concurso (0.02) festão (0.02) piquenique (0.02) retiro (0.02)
545	O professor pediu-lhe para reescrever a	composição (0.20)	tese (0.16) frase (0.14) carta (0.07) história (0.07) palavra (0.07) resposta (0.07) prova (0.05) assinatura (0.02) biografia (0.02) ideia (0.02) notícia (0.02) pergunta (0.02) redação (0.02) reflexão (0.02) sebenta (0.02)
546	O Duarte queria ir a todos os concertos daquele	festival (0.20)	cantor (0.14) dia (0.08) grupo (0.08) mês (0.08) verão (0.08) ano (0.06) artista (0.06) cartaz (0.04) café (0.02) famoso (0.02) fim-de-semana (0.02) jovem (0.02) miúdo (0.02) músico (0.02) sábado (0.02) senhor (0.02)
547	No Natal a avó deu-lhe uma caixa de	chocolates (0.20)	bombons (0.17) brinquedo (0.08) meias (0.08) joias (0.05) rebuçados (0.05) doces (0.03) lápis (0.03) maquilhagem (0.03) música (0.03) sapatos (0.03) biscoitos (0.02) cartas (0.02) doces (0.02) Ferrero (0.02) fotografias (0.02) gomas (0.02)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
			jogos (0.02) magia (0.02) morangos (0.02) Pandora (0.02) peluches (0.02) preservativos (0.02) surpresas (0.02) vernizes (0.02)
548	O Gustavo comprou um brinquedo para a sua	irmã (0.2)	amiga (0.2) filha (0.17) namorada (0.13) prima (0.07) sobrinha (0.07) afilhada (0.03) criança (0.03) enteada (0.03) gata (0.03) mãe (0.03)
549	Ele é muito introvertido e não gosta de ir a	festas (0.2)	escolas (0.12) concertos (0.12) discotecas (0.12) bares (0.04) celebrações (0.04) cinemas (0.04) conferências (0.04) convívios (0.04) eventos (0.04) festivais (0.04) lanches (0.04) praia (0.04) reuniões (0.04) teatros (0.04)
550	O Hugo chegou atrasado por causa do	autocarro (0.2)	trânsito (0.16) irmão (0.11) metro (0.11) pai (0.11) comboio (0.05) despertador (0.05) cão (0.04) tempo (0.04) amigo (0.02) atraso (0.02) furacão (0.02) furo (0.02) jato (0.02) temporal (0.02) transporte (0.02)
551	A professora de geografia pediu para escreverem um trabalho sobre aquelas	montanhas (0.2)	idades (0.17) ilhas (0.11) flores (0.06) localidades (0.06) regiões (0.06) aldeias (0.03) aulas (0.03) capitais (0.03) chuvas (0.03) coordenadas (0.03) experiências (0.03) pedras (0.03) plantas (0.03) revistas (0.03) sociedades (0.03) temáticas (0.03) terras (0.03)
552	O Mário guardou as moedas que recebeu no	bolso (0.2)	natal (0.13) mealheiro (0.13) aniversário (0.1) casaco (0.08) anos (0.03) armário (0.03) café (0.03) carro (0.03) centro (0.03) concurso (0.03) emprego (0.03) estojos (0.03) feriado (0.03) metro (0.03) quarto (0.03) restaurante (0.03) saco (0.03) serviço (0.03) trabalho (0.03)
553	Todos os dias ao jantar o António vê as	notícias (0.2)	irmãs (0.1) novelas (0.1) primas (0.08) amigas (0.05) revistas (0.05) séries (0.05) tias (0.05) armas (0.03) bonecas (0.03) cadeiras (0.03) cartas (0.03) comidas (0.03) contas (0.03) estrelas (0.03) familiares (0.03) filhas (0.03) flores (0.03) netas (0.03) reportagens (0.03) roupas (0.03)
554	O Carlos comeu tudo só deixou no prato um pouco de	arroz (0.2)	carne (0.15) massa (0.09) salada (0.07) alface (0.05) batatas (0.04) comida (0.04) ervilhas (0.04) atum (0.02) brócolos (0.02) cenoura (0.02) espinafres (0.02) fiambre (0.02) frango (0.02) geleia (0.02) legumes (0.02) migalhas (0.02) molho (0.02) morangos (0.02) pão (0.02) pato (0.02) peixe (0.02) pizza (0.02) puré (0.02) tomate (0.02) vegetais (0.02)
555	O Paulo costuma almoçar no	refeitório (0.20)	restaurante (0.17) bar (0.11) café (0.11) jardim (0.09) quarto (0.09) McDonalds (0.04) parque (0.04) bidé (0.02) carro (0.02) Colombo (0.02) Kentucky (0.02) pátio (0.02) quarto (0.02) sofá (0.02)
556	O Fernando quando cozinha suja sempre muito o	fogão (0.20)	chão (0.15) balcão (0.12) avental (0.07) prato (0.07) forno (0.05) lavatório (0.05) microondas (0.05) tacho (0.05) azulejo (0.02) cabelo (0.02) casaco (0.02) estaminé (0.02) frigorífico (0.02) garfo (0.02) pano (0.02) tabuleiro (0.02)
557	A Maria colocou as novas molduras naquela	parede (0.19)	sala (0.16) estante (0.10) mesa (0.10) prateleira (0.10) casa (0.06) pintura (0.06) estátua (0.03) fotografia (0.03) imagem (0.03) lembrança (0.03) parte (0.03) prateleira (0.03) porta (0.03)
558	O Marcelo não tinha dinheiro para pagar a	conta (0.19)	faculdade (0.12) propina (0.12) casa (0.08) comida (0.08) escola (0.08) bebida (0.04) fatura (0.04) fotocópia (0.04) mesa (0.04) multa (0.04) prenda (0.04) refeição (0.04) renda (0.04) toalha (0.04)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
559	O Santiago adora ir correr para o	jardim (0.19)	parque (0.15) ginásio (0.15) campo (0.13) paredão (0.13) estádio (0.04) bosque (0.02) cais (0.02) colégio (0.02) descampado (0.02) mar (0.02) passeio (0.02) pátio (0.02) quintal (0.02) recreio (0.02) treino (0.02)
560	O presidente pediu ajuda para preparar o	discurso (0.19)	evento (0.17) congresso (0.10) debate (0.10) orçamento (0.05) jantar (0.05) trabalho (0.05) arraial (0.02) banquete (0.02) carnaval (0.02) comício (0.02) diploma (0.02) encontro (0.02) espetáculo (0.02) estudante (0.02) exército (0.02) festival (0.02) local (0.02) programa (0.02) visual (0.02)
561	A Raquel queria aproveitar a viagem para conhecer aquelas	pessoas (0.19)	raparigas (0.16) paisagens (0.11) cidades (0.11) amigas (0.05) colegas (0.05) lojas (0.05) meninas (0.05) praias (0.05) zonas (0.05) ilhas (0.03) montanhas (0.03) padarias (0.03) turistas (0.03)
562	O Santiago todas as manhãs vai correr para o	parque (0.19)	jardim (0.16) ginásio (0.11) trabalho (0.08) campo (0.05) pavilhão (0.05) autocarro (0.03) brinquedo (0.03) café (0.03) carro (0.03) clube (0.03) colégio (0.03) museu (0.03) pai (0.03) paredão (0.03) passeio (0.03) polo (0.03) quarto (0.03) ringue (0.03)
563	O médico disse ao José que ele tinha de fazer aquela	medicação (0.19)	consulta (0.14) actividade (0.05) análise (0.05) dieta (0.05) operação (0.05) radiografia (0.05) biopsia (0.03) coisa (0.03) corrida (0.03) ecografia (0.03) endoscopia (0.03) ginástica (0.03) operação (0.03) palestra (0.03) prova (0.03) quimioterapia (0.03) rotina (0.03) tarefa (0.03) terapia (0.03) vacina (0.03) visita (0.03)
564	O Marco foi buscar a roupa que tinha deixado na	lavandaria (0.19)	cama (0.09) rua (0.09) escola (0.07) sala (0.07) varanda (0.07) cadeira (0.05) casa-de-banho (0.05) cozinha (0.05) máquina (0.05) mãe (0.05) cantina (0.02) casa (0.02) corda (0.02) entrada (0.02) faculdade (0.02) janela (0.02) marquise (0.02) mesa (0.02)
565	A cicatriz o João prolongava-se até ao	joelho (0.19)	pescoço (0.19) cotovelo (0.15) pé (0.11) braço (0.07) tornozelo (0.07) olho (0.04) ombro (0.04) peito (0.04) queixo (0.04) umbigo (0.04) verão (0.04)
566	A Maria só passou à segunda no exame de	português (0.19)	matemática (0.17) condução (0.15) código (0.13) história (0.11) biologia (0.07) estatística (0.04) inglês (0.04) neuropsicologia (0.04) ciências (0.02) psicologia (0.02) química (0.02) secundário (0.02)
567	A menina não vai ao parque porque tem medo dos	cães (0.19)	meninos (0.11) pombos (0.09) escorregas (0.07) patos (0.07) animais (0.06) baloiços (0.06) bichos (0.06) ladrões (0.06) pássaros (0.06) rufias (0.04) adultos (0.02) bonecos (0.02) brinquedos (0.02) estranhos (0.02) gatos (0.02) insectos (0.02) outros (0.02) palhaços (0.02)
568	Todos os dias o pai leva os filhos ao	colégio (0.18)	parque (0.11) café (0.08) ginásio (0.08) cinema (0.05) dentista (0.05) infantário (0.05) jardim (0.05) teatro (0.05) almoço (0.03) átrio (0.03) ballet (0.03) campo (0.03) carrocel (0.03) centro (0.03) clube (0.03) futebol (0.03) jardim (0.03) trabalho (0.03) supermercado (0.03)
569	O Duarte foi o primeiro a entrar no recinto do	colégio (0.18)	jogo (0.14) concerto (0.14) campo (0.09) festival (0.09) parque (0.09) desfile (0.05) estádio (0.05) jardim (0.05) jogo (0.05) torneio (0.05) treino (0.05)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
570	Como estava de dieta não podia comer chocolates nem	doces (0.18)	bolos (0.09) gomas (0.09) gorduras (0.09) açúcar (0.05) batatas (0.05) biscoito (0.05) bolachas (0.05) bombons (0.05) carne (0.05) fritos (0.05) pão (0.05) pizza (0.05) presunto (0.05) rebuçados (0.05) salgados (0.05)
571	O Pedro teve de ser operado ao	coração (0.18)	ouvido (0.11) rim (0.11) braço (0.07) cérebro (0.07) estômago (0.07) nariz (0.07) pé (0.07) pulmão (0.07) apêndice (0.04) intestino (0.04) joelho (0.04) olho (0.04) ombro (0.04)
572	O Afonso dava-se bem com os seus colegas de	turma (0.18)	trabalho (0.18) escola (0.14) infância (0.07) andebol (0.04) balneário (0.04) carteira (0.04) casa (0.04) ciências (0.04) curso (0.04) engenharia (0.04) grupo (0.04) judo (0.04) música (0.04) quarto (0.04) sala (0.04)
573	O menino não queria ler aquele livro porque tinha muitas	páginas (0.18)	dificuldades (0.13) dúvidas (0.13) letras (0.11) palavras (0.09) folhas (0.04) frases (0.04) mortes (0.04) tarefas (0.04) contas (0.02) expressões (0.02) histórias (0.02) imagens (0.02) metáforas (0.02) personagens (0.02) referências (0.02) vírgulas (0.02)
574	Os alunos costumam jogar à bola no	recreio (0.18)	pátio (0.14) campo (0.12) jardim (0.12) quintal (0.10) parque (0.08) relvado (0.08) estádio (0.06) intervalo (0.04) terraço (0.04) átrio (0.02) bar (0.02) ginásio (0.02)
575	Depois de cozinhar o Fernando reparou que tinha sujado o	chão (0.175)	avental (0.15) fogão (0.1) tapete (0.1) balcão (0.08) casaco (0.08) cão (0.05) pano (0.05) cachecol (0.03) colarinho (0.03) fato (0.03) garfo (0.03) lenço (0.03) sapato (0.03) tabuleiro (0.03) taco (0.03) telhado (0.03)
576	Os pais decidiram inscrever os filhos no	colégio (0.17)	futebol (0.15) ginásio (0.15) clube (0.07) boxe (0.04) karaté (0.04) teatro (0.04) voleibol (0.04) ATL (0.02) basquetebol (0.02) campo (0.02) concurso (0.02) curso (0.02) escutismo (0.02) explicador (0.02) judo (0.02) grupo (0.02) instituto (0.02) local (0.02) secundário (0.02) teatro (0.02)
577	Antes de começar a escola o Gonçalo pediu ao pai uma	mochila (0.17)	caneta (0.15) bicicleta (0.09) mota (0.09) consola (0.04) festa (0.04) lapiseira (0.04) mesada (0.04) ajuda (0.02) aula (0.02) borracha (0.02) calculadora (0.02) camisola (0.02) carta (0.02) coisa (0.02) consola (0.02) dinheiro (0.02) guloseima (0.02) mala (0.02) moeda (0.02) mota (0.02) reunião (0.02) televisão (0.02)
578	A avó deu à Filomena um lindo par de	brincos (0.17)	meias (0.13) sapatos (0.13) botas (0.12) luvas (0.10) calças (0.06) cuecas (0.06) óculos (0.06) meias (0.04) chinelos (0.02) laços (0.02) patins (0.02) pantufas (0.02) sapatilhas (0.02) ténis (0.02) tentáculos (0.02)
579	A Gabriela esteve horas a esfregar o	cão (0.17)	chão (0.13) cabelo (0.13) olho (0.08) casaco (0.06) gato (0.06) nariz (0.06) teto (0.04) balcão (0.02) braço (0.02) carro (0.02) colchão (0.02) corte (0.02) fogão (0.02) grelhador (0.02) lava-loiça (0.02) ombro (0.02) pulso (0.02) quarto (0.02) sapato (0.02) tapete (0.02) telemóvel (0.02)
580	O Bernardo foi buscar uns alperces à	árvore (0.16)	avó (0.1) mercearia (0.1) horta (0.08) loja (0.08) quinta (0.08) vizinha (0.08) frutaria (0.06) cozinha (0.04) despensa (0.04) aldeia (0.02) amiga (0.02) fazenda (0.02) feira (0.02) garagem (0.02) mãe (0.02) prateleira (0.02) rua (0.02) tia (0.02)
581	O aluno estava confiante que ia conseguir fazer todas as	cadeiras (0.15)	tarefas (0.15) perguntas (0.13) provas (0.13) disciplinas (0.08) questões (0.08) respostas (0.08) frases (0.05) frequências (0.05) actividades (0.04) composições (0.04) etapas (0.04) fichas (0.04)

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
582	O jornalista comunicou o desaparecimento do barco e de um	homem (0.15)	marinheiro (0.15) pescador (0.12) passageiro (0.08) navegador (0.08) turista (0.08) aluno (0.04) amigo (0.04) artefacto (0.04) avião (0.04) navio (0.04) senhor (0.04) tripulante (0.04) viajante (0.04) vizinho (0.04)
583	Quando chegou à estação viu que tinha perdido o	comboio (0.15)	bilhete (0.15) cartão (0.13) passe (0.13) telemóvel (0.11) metro (0.09) autocarro (0.06) casaco (0.04) chapéu (0.04) estojo (0.02) maço (0.02) peluche (0.02) sapato (0.02) tabaco (0.02)
584	Os polícias na reunião com o presidente exigiram mais um	aumento (0.15)	carro (0.15) polícia (0.15) ordenado (0.1) tempo (0.1) debate (0.05) membro (0.05) minutos (0.05) orçamento (0.05) papel (0.05) recrutamento (0.05) salário (0.05)
585	A mãe começou a dar o leite ao bebé no	biberão (0.15)	café (0.1) colo (0.1) hospital (0.1) jardim (0.1) quarto (0.1) almoço (0.05) armazém (0.05) carro (0.05) copo (0.05) primeiro (0.05) sofá (0.05) trabalho (0.05)
586	A Elsa ainda não conseguiu agendar a	reunião (0.15)	consulta (0.15) depilação (0.1) experiência (0.1) actividade (0.05) aula (0.05) compra (0.05) data (0.05) investigação (0.05) manicure (0.05) tarefa (0.05) semana (0.05) vida (0.05) visita (0.05)
587	A banda de música pop adorou tocar naquele	concerto (0.15)	bar (0.13) sítio (0.11) festival (0.09) lugar (0.09) país (0.07) dia (0.05) café (0.04) estádio (0.04) jardim (0.04) palco (0.04) pavilhão (0.04) átrio (0.02) casamento (0.02) coliseu (0.02) espaço (0.02) evento (0.02) local (0.02) verão (0.02)
588	O António começou uma dieta porque está a ficar com	diabetes (0.14)	colesterol (0.14) peso (0.14) fome (0.14) barriga (0.07) banha (0.07) diabetes (0.07) gordura (0.07) nojo (0.07) problemas (0.07)
589	A mãe do Hugo não gostava que ele andasse de	mota (0.14)	carro (0.14) bicicleta (0.10) autocarro (0.08) metro (0.08) calções (0.04) comboio (0.04) gatas (0.04) skate (0.04) avião (0.02) camisa (0.02) casaco (0.02) chapéu (0.02) chinelos (0.02) collants (0.02) maiot (0.02) mochila (0.02) patins (0.02) polo (0.02) ténis (0.02) transportes (0.02) trombas (0.02) tutu (0.02)
590	O André comprou uma máquina nova para o curso de	fotografia (0.14)	psicologia (0.14) informática (0.11) medicina (0.09) matemática (0.07) direito (0.05) estatística (0.05) engenharia (0.05) álgebra (0.02) animação (0.02) cinema (0.02) computação (0.02) cozinha (0.02) design (0.02) economia (0.02) farmácia (0.02) física (0.02) gestão (0.02) jardinagem (0.02) multimédia (0.02) pintura (0.02) tipografia (0.02)
591	A Beatriz todas as semanas compra uma	mala (0.14)	camisola (0.11) pulseira (0.07) revista (0.07) água (0.05) camisa (0.05) garrafa (0.05) prenda (0.05) roupa (0.05) saia (0.05) alface (0.02) banana (0.02) bandolete (0.02) bebida (0.02) bicicleta (0.02) bolacha (0.02) borracha (0.02) blusa (0.02) casa (0.02) joia (0.02) melancia (0.02) mochila (0.02) moldura (0.02) noz (0.02)
592	O Gonçalo decidiu comprar uma nova	bicicleta (0.13)	televisão (0.13) camisola (0.1) mesa (0.07) alma (0.03) amiga (0.03) blusa (0.03) calculadora (0.03) camisa (0.03) carteira (0.03) casa (0.03) consola (0.03) gaiola (0.03) mota (0.03) pasta (0.03) peça (0.03) pulseira (0.03) revista (0.03) régua (0.03) roupa (0.03) viola (0.03)
593	A avó levou para o hospital um pijama e um	roupão (0.13)	chinelos (0.13) livro (0.13) cobertor (0.09) travesseiro (0.09) bolso (0.04) casaco (0.04) computador (0.04) edredão (0.04) gorro (0.04) lanche (0.04) peluche (0.04) saco (0.04) tablet (0.04) telemóvel (0.04)
594	O Fábio todas as manhãs bebe café naquela	caneca (0.13)	chávena (0.11) casa (0.09) pastelaria (0.09) sala (0.07) cadeira (0.07) cafetaria (0.07) loja (0.07) mesa (0.07) rua (0.07) café (0.02) esplanada (0.02) esquina

Nº	Sentence Fragment	Most Frequent Response (CP)	Other Responses (CP)
			(0.02) hora (0.02) máquina (0.02) mercearia (0.02) padaria (0.02) posição (0.02) tarde (0.02)
595	A Maria não podia entrar porque não tinha	cartão (0.13)	dinheiro (0.13) idade (0.10) passe (0.10) bilhete (0.08) autorização (0.06) chave (0.04) identificação (0.04) permissão (0.04) acompanhante (0.02) altura (0.02) amigos (0.02) capacidade (0.02) chapéu (0.02) coragem (0.02) direito (0.02) média (0.02) passaporte (0.02) roupa (0.02) saltos (0.02) sapatos (0.02) transportes (0.02)
596	A mãe disse-lhe para comer mais	fruta (0.12)	sopa (0.12) legumes (0.11) vegetais (0.09) arroz (0.05) carne (0.05) chocolate (0.05) comida (0.05) batatas (0.04) bolo (0.04) brócolos (0.04) peixe (0.04) couves (0.02) devagar (0.02) ervilhas (0.02) gelado (0.02) fatias (0.02) massa (0.02) morangos (0.02) pão (0.02) pudim (0.02) puré (0.02) saudável (0.02) verduras (0.02)
597	Na cantina os alunos comiam sempre	carne (0.12)	sopa (0.10) bem (0.08) massa (0.06) peixe (0.06) alface (0.04) arroz (0.04) mal (0.04) pão (0.04) salada (0.04) sobremesa (0.04) barato (0.02) bitoque (0.02) depressa (0.02) doces (0.02) frango (0.02) gelatina (0.02) juntos (0.02) legumes (0.02) pescada (0.02) pizza (0.02) pouco (0.02) pudim (0.02) rissóis (0.02) sentados (0.02) vegetais (0.02) vegetariano (0.02)
598	O José esperou horas na fila para conseguir comprar aquele	bilhete (0.11)	jogo (0.11) livro (0.11) cd (0.09) chapéu (0.06) chocolate (0.06) computador (0.06) telemóvel (0.06) blusão (0.03) cachecol (0.03) café (0.03) carro (0.03) biscoito (0.03) disco (0.03) paté (0.03) plasma (0.03) presente (0.03) relógio (0.03) telefone (0.03) ténis (0.03)
599	O Vítor traz sempre peixe fresco para casa por ser	pescador (0.11)	peixeiro (0.11) melhor (0.07) fresco (0.07) rico (0.07) vegetariano (0.07) amante (0.04) barato (0.04) biológico (0.04) bom (0.04) bonito (0.04) feirante (0.04) ladrão (0.04) navegador (0.04) saboroso (0.04) saudável (0.04) simpático (0.04) vivo (0.04) vendedor (0.04)
600	O avô costumava beber café com leite naquela	casa (0.11)	cadeira (0.09) caneca (0.09) mesa (0.09) chávena (0.06) pastelaria (0.06) sala (0.06) tarde (0.06) altura (0.04) esplanada (0.04) noite (0.04) padaria (0.04) cafetaria (0.02) época (0.02) esquina (0.02) hora (0.02) jarra (0.02) loja (0.02) manhã (0.02) tabacaria (0.02) varanda (0.02) zona (0.02)