



## Short Communication

# Readers of narratives take the protagonist's geographical perspective. Evidence from an event-related potential study



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## ABSTRACT

This ERP study explores how the reader's brain is sensitive to the protagonist's perspective in the fictitious environment of narratives. Participants initially received narratives describing a protagonist living in a given geographical place. Later on they were given short paragraphs describing another character as "coming" or "going" to a place either close to or distant from the protagonist. Paragraphs referring to distant places elicited larger negative waves than those with places close to the protagonist. Moreover, narratives with the verb *to come* incoherent with the protagonist's perspective (e.g., "she came to the distant place") elicited larger negative-going waves in the 320–400 ms time window than coherent paragraphs (e.g., "she came to the close place"). These results indicate that readers of narratives were able to take the protagonist's geographical perspective, showing discourse-level coherence effects when they read motion sentences with the marked deictic verb *to come*.

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## 1. Introduction

Reading narratives is a complex cognitive process that requires the reader to build rich representations of the fictional world, resulting in some cases in a sort of immersion experience (Zwaan, 2003). So, to properly understand a narrative, readers must be able "to walk in the protagonist's shoes", monitoring his/her here-and-now in the fictional world (Segal, 1995). This requires making inferences about the protagonist's purposes (Young & Saxe, 2009), goals (Graesser, Singer, & Trabasso, 1994), emotional states (De Vega, Diaz, & León, 1997; Gernsbacher & Robertson, 1992; Ruby & Decety, 2004), and spatial perspective (Black, Turner, & Bower, 1979; Bower & Rinck, 2001) that warrant an immersion experience. This study investigates the reader's capability to adopt the protagonist's geographical perspective in the course of the comprehension of sentences involving deictic verbs of motion (*to come* and *to go*).

In everyday experience we continuously monitor and update where we are, keeping under attentional focus our current location, such as this room, this building, this town or this country (Damasio, 2010; Tamir & Mitchel, 2011). In face-to-face conversation, we also rely on the current place as the conversational deictic center, or the speaker's here-and-now (Bühler, 1965). Moreover,

many languages, including English and Spanish, have a repertoire of deictic words (e.g., *here, there, now, before, you*) to refer to places, persons, objects, and events associated with the speaker's deictic center. For instance, in Spanish the deictic verb *venir* (*to come*) refers to a motion toward the speaker's location, whereas the deictic verb *ir* (*to go*) indexes a motion away from the speaker's location. Notice, however, that deictic verbs differ in semantic markedness both in Spanish and English. The proximal verb *venir* (*to come*) is clearly marked as a deictic motion verb referred to the speaker's location, whereas the distal verb *ir* (*to go*) is more general or unmarked (Fillmore, 1975; Levinson, 1996; Miller & Johnson-Laird, 1976; Wilkins & Hill, 1995). Thus, the English verb *to go* involves deictic motion when contrasted with *to come* but is akin to *travel* when contrasted with *stay*, and close to *start* when compared with *stop*. When *to go* is used to mean *to travel* or *to start*, the speaker's location is not important and therefore it does not work as a deictic verb (Miller & Johnson-Laird, 1976, p. 540).

In a previous ERP study it was found that people use their own deictic center by default when they read short paragraphs written in the second person (De Vega, Beltrán, García-Marco, & Marrero, 2015). In that study, the paragraphs described a character as "coming to", "going to", or "being in" either the participants' place of residence or a distant place. They found ERP components that were sensitive to coherence with the readers' deictic center in the context of the deictic verb *to come*. For instance, for readers living in Tenerife, the sentence "she *came* to Barcelona" elicited larger N400 than the sentence "she *came* to Tenerife", indicating a

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coherence effect based on geographic perspective. Interestingly, the contrast between “she went to Barcelona” and “she went to Tenerife” did not produce any N400 coherence effect, confirming that the deictic meaning of the unmarked verb *to go* is less conspicuous than the deictic meaning of the verb *to come*. Moreover, deictic sentences also elicited larger N1 and P3 when they referred to the participants’ place of residence. This suggested that the experimental passages managed to induce self-perspective, given that N1, P1, and P3 have been sometimes considered markers of self-reference or self-relevance (Fields & Kuperberg, 2012; Shi, Zhou, Liu, Zhang, & Han, 2011; Zhou et al., 2010). However, when we understand ordinary narratives the situation differs considerably from face-to-face conversation or second-person paragraphs. Most narratives are written in third person, leading to a situation whereby the deictic center is displaced to the protagonist’s narrative world, rather than the reader’s own deictic center. Thus, in third-person narratives the characters and events are explicitly set up in a fictitious scenario that differs from the reader’s deictic center (e.g., Black et al., 1979; Duchan, Bruder, & Hewitt, 1995). Taking the protagonist’s perspective allows readers to understand deictic terms such as *you*, *I*, *here*, *there*, or the verbs *to go* or *to come* in the framework of the narrative world, allowing the tracking of the protagonist’s surroundings and thus contributing to the reader’s immersion experience.

This study explores the brain’s electrophysiological response to the protagonist’s geographical perspective during the comprehension of third-person narratives that include passages describing spatial displacements with reference to the protagonist’s point of view. Participants first read a short narrative describing the protagonist’s main features and his/her place of residence (e.g., Barcelona), which is different from the reader’s location. Then several paragraphs follow, each describing the protagonist’s encounter with a secondary character (e.g., “Montse met a young researcher”) and a displacement of this new character by means of the deictic verbs *to come* or *to go* to a close or distant place, for instance, “she came to Barcelona” or “she came to Seville”. Notice that each experimental paragraph described a directional motion performed by a secondary character (e.g., the researcher). Nonetheless, the narrative and the experimental paragraphs always focus on the protagonist’s perspective rather than on the secondary character’s perspective. This focus on the protagonist and his/her perspective was promoted by the previous narrative context, the use of proper name mark (Sanford, Moar, & Garrod, 1988), and the fact that the encounters with secondary characters were described from the protagonist’s point of view. The current study uses materials and procedures similar to those employed in the study by De Vega et al. (2015), but it differs in some crucial features. Rather than explicitly inducing the reader’s self-involvement by means of second-person paragraphs, in this study we created a third-person narrative context with the protagonist’s geographical environment as background. Consequently, we do not expect modulations in the early ERP components associated with the self (N1, P2 or P3) (Knyazev, 2013). By contrast, we think that taking the protagonist’s perspective may determine a prominence of his/her location, and coherence effects will emerge when the verb that indexes motion violates the protagonist’s perspective. Specifically, we predict that the marked deictic verb *to come* combined with a geographical place that is incoherent with the protagonist’s location (e.g., “coming to distant place”) could enhance late negativity components of the ERPs (N400) in comparison with the condition that is coherent with the main character’s location (“coming to close place”). We predict this will happen, because the N400 is a general electrophysiological marker of semantic coherence, which is sensitive not only to lexical factors like cloze probability of words (Kutas & Federmeier, 2011;

Kutas & Hillyard, 1980), but also to discourse-level incoherence (Coulson & Kutas, 1998; Kuperberg, Paczynski, & Ditman, 2011; León, Díaz, de Vega, & Hernández, 2010; Santana & de Vega, 2013; Van Berkum, Brown, Zwitterlood, Kooijman, & Hagoort, 2005). In this paper the expected N400 coherence effects derive from the protagonist’s geographical perspective, a discourse-level rather than a sentence-level feature.

## 2. Method

### 2.1. Participants

Thirty-two Spanish-speaking undergraduate students (24 female; age range 18–29 years) of the University La Laguna participated in the study. They gave informed consent, and received course credits for their voluntary participation. All were right-handed and reported normal or corrected-to-normal vision, and no neurological or neuropsychological anomalies were reported. All had been living in the Canary Islands for at least 2 years, and none had lived in Catalonia or Andalusia for more than 2 months. Two subjects were excluded due to excessive EEG artifacts (eye-motions and drifts) and poor performance in the control task (more than 40% error rate). All the participants were tested in the University of La Laguna (Tenerife, Canary Islands), and fulfilled the protocol approved by the Ethical Committee.

### 2.2. Materials

Four narratives were created to introduce the protagonists and their places of residence. The narratives were of similar length (between 264 and 278 words), and they comprised 8 short paragraphs each. Narrative 1 and Narrative 2 described, respectively, a woman (Montse) and a man (Jordi), both living in the city of Barcelona, in the region of Catalonia (North-East Spain). Narrative 3 and Narrative 4 described, respectively, a woman (Rocío) and a man (Pepe), both living in the city of Seville, in the region of Andalusia (South Spain). To help readers to form clear impressions of the protagonists, their names, customs, affiliation, cultural background, and scenarios were typical of the city or region where they lived. A total of 120 experimental paragraphs were also constructed. Each paragraph described an encounter or chat in an undetermined place between the protagonist and a secondary character referred to by his/her role (e.g., professor, friend), followed by a description of the secondary character’s displacement to a specific geographical place, along with the reason for this displacement. Also, 52 filler paragraphs were created, similar in syntactic structure to the experimental ones. Unlike the experimental paragraphs, however, the fillers used a variety of non-motion verbs and did not include any geographical place name. Rather, they described traits, customs, or affiliations referring to the protagonist, which were either correct or incorrect, according to the previously read narrative. A narrative and examples of experimental and filler paragraphs appear in Appendix A.

### 2.3. Design

A 2 Deictic verb (*to go* vs. *to come*) × 2 Geographical place (close vs. distant) repeated measures factorial design was created. In Narratives 1 and 2 the city of Barcelona and the region of Catalonia were close-to-protagonist places, whereas the city of Seville and the region of Andalusia were distant-from-protagonist places. In Narratives 3 and 4 the close and distant Geographical places were reversed. Each Geographical place appeared in 30 out of the 120 experimental paragraphs.

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