Encoding and decoding motion events in English and French: comparative case-studies in aphasia and anoma

Efthasia SOROLI 1, Maya HICKMANN 2 & Holima SAHRAOUI 2
1 Laboratoire Structures Formelles du Langage (UMR 7222), CNRS & Université Paris 8, France;
2 University of Toulouse 3-Le Mirail. OCTOGONE-Jacques Louard Unit (EA 1184). Brain Sciences Institute (IFR 54). France

INTRODUCTION
Languages encode space onto lexical and syntactic structures in strikingly different ways [1]. With respect to the expression of motion, some languages express Manner in verb roots and Path in satellites (e.g., English: The woman walked into the room); whereas others lexicalize Path in the verb leaving Manner implicit or peripheral (e.g., French: La femme entre dans un chambre en courant). Such typological properties strongly constrain the way in which speakers choose to encode in discourse different motion components (Path/Manner), thus raising questions concerning the relation between language and thought [2,3]. In addition, such linguistic diversity is of great interest for the study of aphasic speakers who typically present dissociations between lexical/syntactic knowledge. Despite some crosslinguistic studies of aphasia [4,5], little is still known about universal vs. language-specific aspects of encoding [6] and decoding [7] processes across aphasic syndromes [8].

Our study aims to determine the respective role of language-independent (syndrome-related) vs. language-specific (typological) factors in fluent and non-fluent aphasia; the first predicting broad differences between syndromes but little differentiation as a function of language, the second predicting more differentiation as a function of the language type, with few differences in the nature of grammatical breakdown among aphasic types.

METHOD
To measure the relative role of language-independent and language-specific factors, we compared the grammaticality and context of the sentences of English and French (N=4) with control speakers (N=40) in how they perform comprehension and production tasks.

In comprehension, participants were asked to choose the clip that best corresponded to a sentence presented auditorily and which varied in the number and the semantic components encoded (P-only, M-only, PM-sentences, see fig.1). The analyses examined response accuracy and reaction times. In production participants were asked to describe motion events presented visually (fig.2), and analyses examined the types of information expressed (Manner/Path), the linguistic means used (verbs/adjuncts), and the compensation strategies followed by aphasic speakers.

The production data were transcribed in CHAT format [9] and coded for semantic information, parts of speech, and utterance type. Data were coded with respect to information density (the quantity of the information expressed in the utterances), focus (Manner and Path information as identified in all parts of speech) and locus (Manner and Path information as expressed in the main verbs and in other linguistic means).

The results are in the tables below and in the presentation. The data were analyzed using ANOVA and post hoc comparisons using the Tukey method. Overall, our results showed that while both English and French agrammatic speakers had difficulties in encoding motion in their productions, the types of information expressed in the main verbs differed (e.g., in English, Path is encoded more often than Manner; in French, Manner is encoded more often than Path) and the choice of verbs and auxiliaries was different across languages. Overall, the results suggest that while both English and French agrammatic speakers have difficulties in encoding motion in their productions, the types of information expressed in the main verbs differed (e.g., in English, Path is encoded more often than Manner; in French, Manner is encoded more often than Path) and the choice of verbs and auxiliaries was different across languages.

DISCUSSION
Comprehension: Aaphasic participants had no difficulties in correctly interpreting sentences, but showed overall slower performance as compared to controls and variation across languages and within syndromes with respect to RTs.

Production: The findings show overall crosslinguistic differences in the structures used by controls resulting in more semantic density in English (Manner vs. Path) than in French (Path verbs, infrequent Manner). In aphasia: a part from syndrome-related symptoms (e.g., vulnerability of morphology in agrammatic) overall low semantic density in the utterances of aphasic speakers and preference for encoding the most basic component (Path). The same syndromes looked quite different from one language to another showing that language-types account for more variance than syndromes. More specifically: with respect to French aphasia: the agrammatic speaker mostly combined Path satellites with light verbs without verbal morphology (1); whereas the anomic mostly focussed on Path, expressed in verbs (2) with respect to English aphasia: the agrammatic participant used either Path devices (down, top) or Manner verbs, omitting tensed auxiliaries (3); while the anomic omitted most verbs, expressing mainly Path information in peripheral devices (4).

CONCLUSION
The aphasic data first show a dissociation between relatively spared comprehension skills, language differences in processing times, and important difficulties in production. Although syndrome-related factors play an important role in aphasia, similar typological language properties have a strong impact on both the encoding and decoding of speakers with aphasia. Typology must be taken into account in aphasia research and in the study of the language-thought interface more generally as a factor that can affect performance in significant ways.