Expressing and Categorizing Motion in French and English : Verbal and Non-Verbal Cognition across Languages

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Verbal and non-verbal cognition across languages

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INTRODUCTION

Crosslinguistic differences in spatial expression have been shown to influence speakers' focus on particular event components in discourse (Slobin 2004; Talmy 2000). For example, *Satellite-framed* languages express Manner of motion in verb roots and Path in satellites (English 1), whereas *Verb-framed* languages lexicalize Path in the verb leaving Manner implicit or peripheral (e.g., French 2):

1. *He walked into the room*
2. *Il est entré dans la pièce [en marchant]).*

A debated question is whether such typological differences also influence non-verbal cognition (Gennari et al., 2002; Papafragou & Selimis 2010). The present study addresses this question by comparing verbal and non-verbal responses produced by adult native speakers in two language groups, English and French, differing with respect to motion expression.

METHOD

To measure the relative role of language-independent and language-specific factors, we compared the verbal and non-verbal performance of adult English and French native speakers.

Subjects (16 per language) performed three tasks involving motion events (Fig. 1).

***(1)Categorization, non-verbal condition*:** Participants saw a target cartoon (e.g. a cat walking up a hill), then two variants that differed from it with respect to Manner or Path (walking down vs. jumping up). They then had to choose which variant best matched the target, while simultaneously performing a syllable repetition task that prevented them from internally verbalizing the stimuli.

***(2)Categorization, verbal condition*:** The target was a sentence presented orally (*There's a cat walking up a hill*), rather than a video (no interference task).

***(3)Production*:** Participants were asked to describe the target cartoons.

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- Stimuli were controlled for left-right direction of motion.
- Participants carried out the three tasks in a fixed order (non-verbal categorization first, production last).
- Analyses of productions examined the types of information expressed (*Manner*/*Path*) and the linguistic means used (verbs/adjuncts).
- Analyses for categorization examined preferential criteria (Manner or Path) and reaction times.

STIMULI

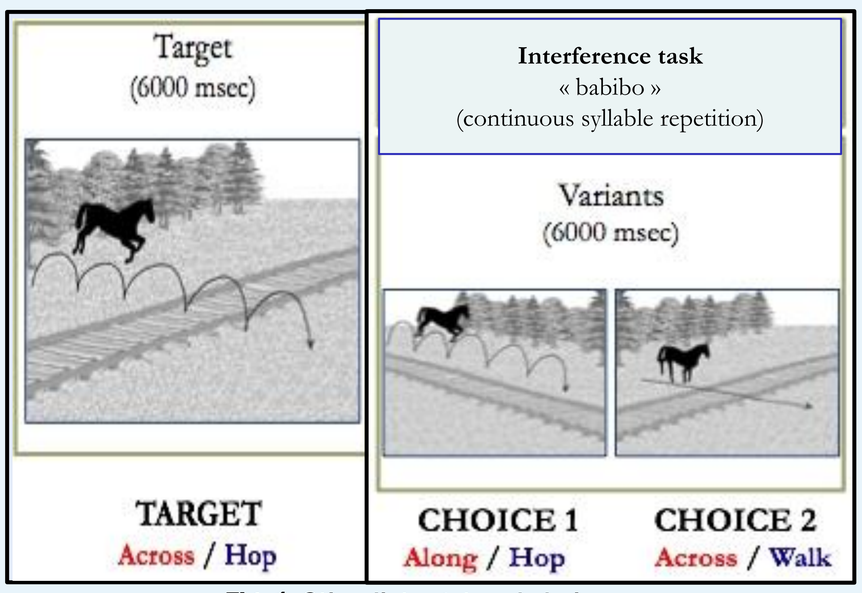

Fig. 1. Stimuli: target and choices.
Triads were used in categorization, targets only in production

Stimuli:

Short cartoons showing voluntary motion varying in terms of:

- ***Manners:***
  RUN, JUMP, WALK
- ***Paths:***
  ACROSS, ALONG, INTO, OUT-OF, UP, DOWN.

RESULTS

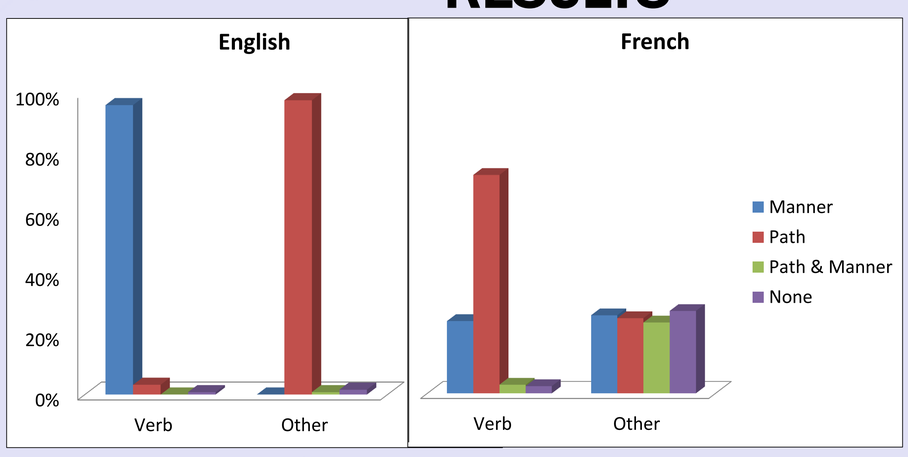

Fig. 2 Information locus in production

1. *The horse trotted down the hill.*
2. (a) *Un ours qui traverse les rails.*'
   A bear that crosses the tracks.'
   (b) *Un ours rentre dans la maison en sautillant.*
   'A bear enters the house whilst hopping'
3. *Un lion court à côté de la voie ferrée.*
   'A lion runs next to the rail track.'

The production task (Fig. 2) shows crosslinguistic differences in the structures used by speakers in the two language groups.

- In English: Manner verbs with Path adjuncts (ex. 1).
- In French: Path verbs, less frequent Manner (ex. 2 & 3).

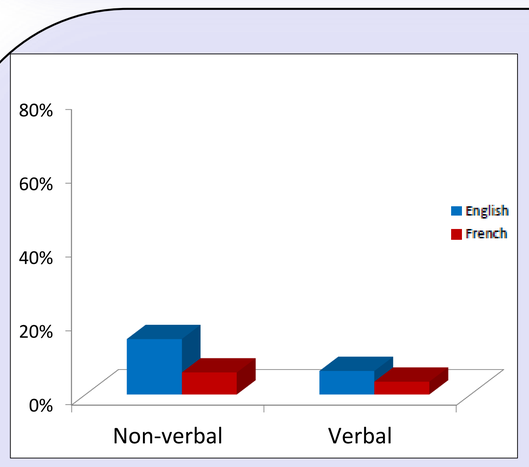

Fig. 3. Manner choices in verbal vs. non-verbal conditions

Speakers' choices of Manner vs. Path criteria depended on conditions and stimuli properties (Manner and Path).

- **Conditions (Fig. 3)**

Overall, both groups rely less on Manner in both conditions, notwithstanding two tendencies (not significant):

- English group ≥ French group;
- non-verbal ≥ verbal condition (English group).

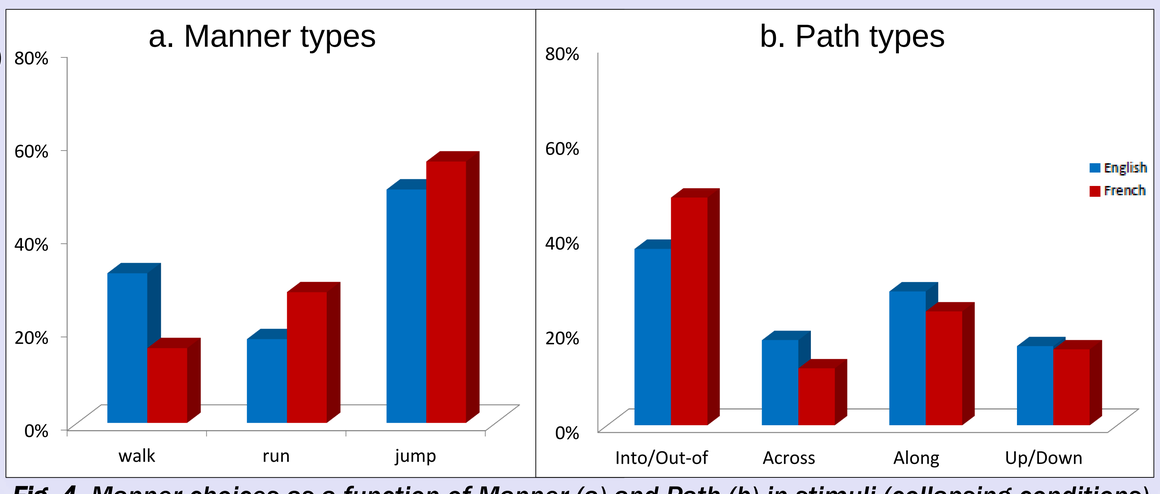

Fig. 4. Manner choices as a function of Manner (a) and Path (b) in stimuli (collapsing conditions)

Categorization

- **Manner types (Fig. 4a)**

Both groups rely more on Manner when the Manner in the stimuli is salient:

salient > not salient
(jump > *walk,run*)

- **Path types (Fig. 4b)**

Both groups rely more on Manner when the Path in the stimuli is INTO/OUT than with other paths.

- **Interaction Path x Condition (Fig. 5)**

Boundary crossings (INTO, OUT OF, ACROSS) elicit more Manner choices than other Paths for both groups and in both conditions, but more so in French than in English in the verbal condition.

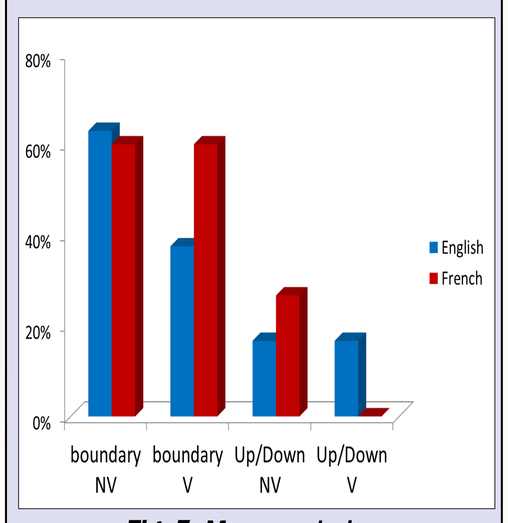

Fig. 5. Manner choices by Path type & Condition

In addition, other interactions show that:

- INTO/OUT-OF elicit most manner choices in both conditions and in both languages.
- ALONG elicits most Manner choices in the verbal condition.
- UP/DOWN elicit Manner choices in English in both conditions but only in the verbal condition in French.
- In both languages ACROSS elicits Manner choices in the verbal condition but less so in the non-verbal condition in French.

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CONCLUSIONS AND PERSPECTIVES

(1) Language properties influence verbal cognition, but do not seem to impact non-verbal cognition

- Language differences occur in the production task that explicitly implies language use, but not in the categorization tasks (neither in verbal nor in non-verbal conditions).

(2) Manner and Path components are differentially accessible

- Path is the main criterion chosen for categorization in both groups and in both conditions.
- However, relative focus on Manner depends on event type (boundary crossing > vertical; M salience)
- Interactions also occur between event type, condition, and language.

(3) Methodological issues to take into account when testing language effects on non-verbal cognition (in progress)

- Stimuli: It is necessary to use more ecological motion (humans, videos) and to balance the salience of Path and Manner.
- Measures: It is necessary to test on-line processes of attention allocation (eye-tracking).

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