Language and Cognition (2024), 16: 4, 1105–1133
doi:10.1017/langcog.2023.74

ARTICLE

Processing manner under high cognitive pressure: Evidence from French–English and English–French simultaneous interpreting

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(Received 01 February 2023; Revised 13 December 2023; Accepted 15 December 2023)

Abstract

The expression of manner has been extensively studied in the case of motion event descriptions, unveiling significant typological differences between satellite-framed and verb-framed languages and cognitive differences between speakers of these languages. However, far from being restricted to this semantic domain, the expression of manner extends to other types of event descriptions and across virtually all verb classes. In this paper, by considering all the means of expressing manner and grounding our research in a domain-independent definition of this component, we investigate the expression and the transfer of manner under high cognitive pressure as evidenced by corpus data from French–English (FE) and English–French (EF) simultaneous interpreting. Unexpectedly, both French and English displayed an overall cross-domain preference for the verbal-lexical coding of manner in event descriptions, while still differing in the degree to which it was favored. In addition, although our study does not allow a direct measure of cognitive load, the FE interpreters transfer more manner from the source to the target speeches than the EF interpreters do, despite high pressure on cognitive resources, supporting the claim that manner can be cognitively more salient and accessible for English than for French speakers, not only in the domain of motion but also at a more general level, potentially in any semantic domain.

Keywords: cognitive load; event encoding; event integration theory; event processing; manner; simultaneous interpreting

1. Introduction

In his works on motion events and event integration across different languages, Talmy (1985, 1991, 2000, 2009) showed that motion event descriptions can be decomposed into four minimal semantic components and a further optional one. These are: Motion, which '[…] refers to the presence per se of motion or locatedness

in the event' (Talmy, 2000, 25); Figure and Ground, referring to '[…] one object (the Figure) moving or located with respect to another object (the reference object or Ground)' (Talmy, 2000, 25); Path, which 'is the Path followed or site occupied by the Figure object with respect to the Ground object' (Talmy, 2000, 25); and lastly, one optional component '[…] that most often bears the relation of manner or cause to it' (Talmy, 2000, 26). The four minimal semantic components constitute what Talmy called the 'framing event', while the fifth optional component was identified as a 'co-event' (see Talmy, 2000, 220–221). Drawing on recurrent observations of morpho-syntactic regularities across different languages in how the Path component is encoded, Talmy (1985, 1991, 2000) developed a two-way typology accounting for two main diverging structural patterns. On one side of the typology are verb-framed languages (VFLs) such as Japanese or French which usually encode path of motion in the verb and leave the manner co-event as an option that may be encoded in an adjunct (1). On the other side of the typology, satellite-framed languages (SFLs) such as Russian or English usually encode path in a 'satellite', rendering the verb available to conflate the manner co-event within the same clausal unit as the framing event (2), both then 'conceptually integrated into a unitary event' (Talmy, 2000, 220). While a motion event cannot be conceptualized without the Path component, it can be conceptualized without the Manner component. In turn, because manner is more often borne by adverbial adjuncts in VFLs (1), which are not obligatory to form a grammatical clause, this component is generally mentioned only if it is the focus of attention in the event description as in the French example in (1). If not, manner may be omitted and, depending on the context, inferred (3). By contrast, because manner is generally borne by the verb in SFLs (2) and the verb is a clause-obligatory constituent, manner is frequently expressed in this language type.

(1) Elle traversa la rue **en courant**.
'she crossed the street running'
(2) She **ran** across the street.
(3) Elle traversa la rue.
'she crossed the street'

Drawing on Talmy's own hypotheses that these typological differences affect the cognition of speakers (Talmy, 128–133), Slobin (1987, 1996, 2003, 2006) and Slobin et al. (2014) provided experimental evidence that the conflation of the manner co-event with the framing event at the core of a proposition in SFLs could make manner cognitively more salient and accessible to speakers in language use. Slobin proposed a twofold explanation, both cognitive-behavioral and psycholinguistic. On the cognitive and behavioral side, the frequent exposure of speakers to manner which is induced by SFL structural properties arguably results in a particular focus on this dimension because of 'the habitual attention to the granularity of experience which is readily encoded in the language' (Slobin, 2006, 17). On the psycholinguistic side and in line with Talmy's own formulation (Talmy, 2000, 128–133), the central syntagmatic nature of verbs is thought to mentally background the processing of this component and thus allow for an overall coding of manner at *lower processing costs* in SFLs than in VFLs (Slobin, 2006, 17). On the contrary, VFL speakers are both less frequently exposed to the manner dimension of motion events because of the typological characteristics of their language, and a heavier processing load could be

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incurred when they do express manner because VFLs tend to instantiate manner at a supposedly more resource-consuming level of syntax.

While the typological differences unveiled by Talmy in the domain of motion have been extensively studied both in their linguistic diversity across languages (Beavers et al., 2010; Berman, 1994; Berthele, 2013; Özçalıskan, 2004; Slobin, 2004; Soroli & Verkerk, 2017; Strömqvist & Verhoeven, 2004; Verkerk, 2013) and in their consequences on speakers' language use and cognition (Flecken et al., 2015; Özçalıskan & Slobin, 1999; Stocker & Berthele, 2019; Berman & Slobin, 1994), the encoding of the above-mentioned semantic components has only been explored to a limited extent in other types of event descriptions (see for instance, on creation events with resultative PPs such as *to carve wood into a toy*, Schirakowski, 2022). Nevertheless, Beavers et al. (2010) suggested that Talmy's typology of motion events may acquire an even wider relevance in that the Path versus Manner opposition could be revisited as depending on more general lexical and morpho-syntactic properties of languages which are not specific to the domain of motion. Moreover, according to Levin and Rappaport Hovav (2019), the differences in how VFLs and SFLs express Manner and Path in the motion domain represent only one specific instance of a more general opposition between Manner and Result. These studies suggest that studying manner beyond the domain of motion may prove useful to test whether the semantic components at the core of Talmy's Event Integration Typology are relevant in other domains as well.

Our main concern here is the cross-domain encoding of the Manner component in French and English, taken as representative of VFLs and SFLs. A substantial body of research indicates that, far from being restricted to the semantic domain of motion, the expression of manner extends to virtually all verb classes (Fellbaum, 2002; Miller & Fellbaum, 1992), suggesting that manner structures almost all conceptual domains (cf. Moline & Stosic, 2016; Stosic, 2019). For instance, the existence of manner verbs within several verb classes is supported by numerous studies dealing with different languages: manner of speaking verbs – *to whisper, to shout, to mumble* (in English, Levin, 1993; Sandford, 2016; Stoica, 2021; Zwicky, 1971; in English and Spanish, Rojo & Valenzuela, 2001; in French, Lamiroy & Charolles 2008; Moline & Stosic, 2016; in Italian, Mastrofini, 2015), manner of killing verbs – *to drown, to hang, to crucify* (in English, Ausensi, 2019; Beavers & Koontz-Garboden, 2012), manner of eating verbs – *to bite, to gobble, to chew* (in Athapaskan, Rice, 2009; in Croatian, Parizoska & Tušek, 2022; in German, Spanish and Catalan, Oster & Molés-Cases, 2016), manner of cutting verbs – *to shave, to slash, to snip* (in English, Mairal Usón & Faber, 2002), manner of vision verbs – *to stare*, *to glance*, *to peek* (in English and Spanish, Cifuentes-Férez, 2014), among others.

In order to avoid restricting this study to a particular domain and to extend our scope of observation, we adopt an onomasiological[1] approach to corpus data by grounding our research in a clear domain-independent definition of manner. We collected all manner expressions encoded in four original (source) political speeches in French and four original political speeches in English in order to determine whether, in such a cross-domain corpus, manner is more frequently expressed in English than in French and whether English displays an overall preference for

[1]An onomasiological approach to corpus data is one which starts from a given concept (here *manner*) and looks for the linguistic forms that bear this concept.

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encoding manner in the verb root rather than through adjuncts, and the reverse for French, as pointed out for the motion domain.

Our second major concern here is to investigate the cross-linguistic processing of manner under high cognitive pressure as evidenced by corpus data from French–English (FE) and English–French (EF) simultaneous interpreting (SI). As is well known (see: Gile, 2009; Seeber, 2011), this type of cross-linguistic data is produced under heavy cognitive pressure by expert bilingual speakers. SI data thus allow for the testing of both the linguistic-structural and psycholinguistic-cognitive consequences of the posited domain-independent properties of VFLs and SFLs. By comparing the source speeches with the corresponding interpreted outputs, we evaluate how interpreters process manner depending on a) directionality (EF or FE) and b) input rates (IRs) (in words per minute), a variable known to impact the cognitive load of interpreters (Gile, 2009; Seeber, 2011). In doing so, we wish to test not only if manner is overall more frequently expressed linguistically in cross-domain original productions, but also if it is more efficiently processed psycholinguistically *into* English as a SFL than *into* French as a VFL. Given the alleged high manner salience in SFLs, and its relative fragility in VFLs, one can expect that the cognitive pressure inherent to the task of SI will emphasize the structural differences between English and French, as representative of Talmy's two main typological patterns. Consequently, processing manner from French into English should be (much) more efficient, than processing the same component from English into French. SI thus appears as a very interesting case for exploring event integration theory as it can reveal how events are remembered and, consequently, what components of events are being focused on and preferentially transferred into the target language depending on the typological pattern of the source or target languages involved.

Because our data were extracted from authentic interpreted political speeches broadcasted by institutional or media organizations, this exploratory study is clearly naturalistic in approach and accounts for the expression and the interpretation of manner in conditions of maximum ecological validity (see Alves, 2015).

Section 2 presents the onomasiological approach to manner which enables the broadest possible inclusion of linguistic forms and semantic values that instantiate it in discourse. Section 3 presents SI data as relevant for testing both linguistic and psycholinguistic hypotheses. In Section 4, we define the different objectives and the analytical approach to corpus data. Section 5 presents our corpus as well as the data collection and coding methods. Section 6 illustrates the results of this research. Finally, we discuss in Section 7 the implications of our structural and cognitive findings as to the expression of manner in French and English in semantic areas other than motion.

2. Toward a comprehensive definition of manner based on an onomasiological approach

In exploring the typological differences between VFLs and SFLs, Talmy (1985, 2000) identified manner as an optional 'co-event' which may or may not be expressed in addition to more basic spatial components. While Talmy's approach has highlighted the constraints that language structures impose on meaning and cognition, it did not provide a precise definition of manner which has remained an ill-defined notion. However, given that manner as a semantic component may structure any conceptual

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domain (Fellbaum, 2002; Moline & Stosic, 2016; Stosic, 2020), an in-depth cross-linguistic corpus exploration of this component should be grounded in an appropriate and clearly formulated definition so as to systematically identify this semantic component in speakers' productions. Nevertheless, while a reliable definition seems indispensable for corpus studies, manner seems to be a difficult notion to grasp because it occurs in language and discourse as a 'pervasive linguistic phenomenon' (Stosic, 2020, 127) which may be expressed via a wide range of *linguistic forms* and conceptually construed through a wide array of more specific *semantic values*. Nevertheless, Moline and Stosic (2016) and Stosic (2011, 2020) showed that linguistic devices interpreted as expressing manner share common underlying mechanisms, and proposed a precise definition which can be used to conduct thorough corpus explorations of manner in any semantic domain. We will briefly illustrate the formal and semantic diversity of manner and set out the definition that this study builds upon.

2.1. Formal diversity of means of expressing manner

At the formal level, Moline and Stosic (2016) and Stosic (2011, 2020) showed that manner can be expressed via five different types of linguistic devices, namely lexical (4), syntactic (5), morphological (6), grammatical (7) and even prosodic (e.g. by using intonation – see Stosic, 2020) (see also Beavers et al., 2010; Corona & Pietrandrea, 2021):

(4) He **scribbled** a foul drawing.
(5) This issue must be **squarely** addressed.
(6) They welcomed the news enthusiastical**ly**.
(7) **How** did you guide the visit?

Although prosodic strategies do undeniably participate in the elaboration of manner in discourse, they will not be considered in this study.

This general description of five means of expressing manner can be further refined with a diverse set of linguistic forms.

Lexically encoded manner appears in nominal (8), verbal (9) or adverbial (10) forms:

(8) There are many **ways** to build a career.
(9) I **agonized** over this issue for weeks.
(10) Their children were educated **well**.

At the syntactic level, one can use, among others, adverbs (11), prepositional phrases (12), gerunds (13) or subordinate clauses (14) to express manner (see for English, Hasselgård, 2010; for French Moline & Stosic, 2016; Stosic, 2019, 2020; for Italian Corona & Pietrandrea, 2021):

(11) I answered **indecisively**.
(12) They treated me **without care**.
(13) He answered **sighing**.
(14) Tim took it easy on him **as his father usually did**.

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Morphological strategies for encoding manner may operate, for instance in English, with a set of affixes: *-ly* (15), *-wise* (16), *over-* (17) and *under-* (18) among others:

(15) We relentless**ly** toured Argentina last summer.
(16) We were housed student-**wise** in dormitory rooms.
(17) I believe I **over**cooked the turkey.
(18) You should not **under**emphasize your interest in this matter.

Grammatical means of expressing manner are generally very few and come down to the words *how* (19), *as* (20) or *like* (21) and some of their derivatives (*somehow*, *alike*, etc.):

(19) **How** you deal with employees' demands is not my business.
(20) I laid the table **as** I always do.
(21) I answered the question **like** I did not care.

Stosic (2020, 139) advocates that 'the study of manner must rely on a multilevel approach that takes this diversity of linguistic strategies into account'. However, in order to accurately identify all manner expressions in discourse, this notion must be clearly delineated both in semantic and theoretical terms.

2.2. Manner as a semantically heterogeneous concept

In accordance with Guimier's (1996, p. 61) claim that manner is 'a heterogeneous value involved in various domains', we acknowledge that the formal diversity of manner articulates with a wide diversity of semantic values. This heterogeneity is observed at several levels of linguistic analysis. For instance, at the lexical level the manner component is conveyed through an array of more specific semantic values as has been shown in the domain of motion (Cardini, 2008; Malt, Gennari & Imai, 2008; Slobin et al., 2014; Stosic, 2019) where parameters such as SPEED (*to rush*, *to run*, *to dawdle*), BODY MOTION PATTERN (*to walk*, *to stagger*) or SHAPE OF THE PATH (*to weave*, *to zigzag*) for example are at play in elaborating specific dimensions of motion. The same can be said of other domains as in manner of speaking verbs which also rely on parameters such as PURPOSE(LESS) (*to prattle*, *to ramble*), ELOCUTION (*to declaim, to stammer*), FORCE (*to exclaim, to shout*) (Moline & Stosic, 2016; Stosic, 2020).[2] At the syntactic level, manner can result from a variety of more or less overlapping meanings conveyed by so-called manner adjuncts with values such as instrument (22), means (23), intensity (24), comparison (25), aspect (26), consecutivity (27), finality (28) or even some qualifying elements (29) which may all be analyzed, contextually, as triggering a manner interpretation:

(22) I ate the noodles **with chopsticks**.
(23) They arrived at a conclusion **by taking all the facts into account**.
(24) She hit the punching bag **hard**.

[2]Note that several of these parameters are likely to be at play in distinct domains. For example, the parameters of FORCE, PURPOSE and SPEED operate both in manner of motion and manner of speaking verbs.

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(25) They smoked **like Parisians do**.
(26) He disappeared **in a flash**.
(27) He talked to me **in such a way that I gave up listening**.
(28) She cleared out the beach **so that it would look spotless**.
(29) He lunged **eyes shut** into the cabin.

The same holds true at the morphological level, especially in the verbal domain, where different affixes, when combined with verb stems, express manner by specifying instrument (e.g. Lakhota *ya-blečha* 'break or cut with the teeth', *na-blečha* 'break by kicking or stepping on', cf. Foley and Van Valin, 1984), diminution (e.g. French *boit-ill-er* "to limp slightly' < *boiter* 'to limp'), iteration and pluralization (e.g. French *sautiller* 'to hop (around)' < *sauter* 'to jump', *voleter* 'to flutter' < voler 'to fly', see Stosic & Amiot, 2019).

These observations led Moline and Stosic (2016, 189–192) to describe manner as a two-level concept by distinguishing *manner in a broad sense* and *manner in a narrow sense*, which means that it operates on two levels of abstraction (see Figure 1). Manner in a broad sense corresponds to an extremely abstract concept, generally matching with indefinite manner grams such as *how* in English, covering a wide range of potential constants as illustrated in previous examples, whatever the level of linguistic analysis. All these devices 'act as operators of diversification by carrying out a qualitative modification of a process or of a state' (Stosic, 2020, 145) (cf. *to go* vs *to run*, *to eat* vs *to eat with chopsticks*). Manner in a narrow sense refers to more specific semantic values that operate at the lower level, and contrasts with several other more or less autonomous notions (e.g. means, instrument, comparison).

Defining manner as a two-level concept makes it possible to propose two semantic interpretations for a single manner expression (e.g. manner and instrument (22), or manner and comparison (25), etc.), and to keep them as equally relevant while distributed onto two different levels of abstraction.

According to Stosic (2020), whether expressed directly through verbs (*to babble*) or in syntax through adjuncts (*to eat with chopsticks*), the specific semantic features or co-occurring values all result in a more general subsuming manner interpretation that stems from a common underlying conceptual operation. These semantic mechanisms, as do several others that emerge from an onomasiological approach, pave the way toward a more rigorous definition of manner.

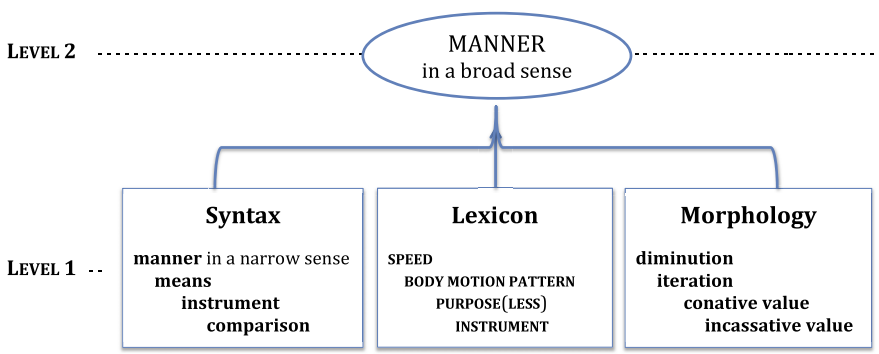

Figure 1. Manner as a two-level concept (from Stosic, 2020, 146).

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2.3. A more comprehensive definition of manner

There are two main obstacles that need to be overcome to make manner a valuable analytical tool in descriptive linguistics. The first one lies in the overt lack of a clear, consensus definition of this notion. The second stems partially from the first one and, more specifically, from the complex intricacies between manner and a series of neighboring values such as instrument, means, quality, comparison, intensity and so on, as shown in the previous section. Faced with such a diversity of manner devices and with the ill-definedness and rather intuitive use of manner in the literature, Stosic (2011, 2019) presented a definition which accounts for the common underlying mechanisms of all manner expressions:

> Manner is a complex semantic value, incidental by nature to some substrate element that is processed by various lexical, syntactic, morphological, grammatical and prosodic means and strategies. This processing results in diversifying the substrate by specific qualitative features, and thereby in characterizing/modulating it. The substrate must belong to one of the following ontological types: actions, states or qualities. (Stosic, 2019, 152).

First, this definition clearly states that manner is a cluster concept made up of a great variety of more basic semantic values and parameters. Second, it emphasizes the conceptual (and linguistic) subsidiarity of manner as it requires another semantic content acting as a substrate of specification and can in no way be realized as an autonomous value (see also Talmy, 2000, Vol. 2, 37). Third, this substrate content can be modified by several kinds of linguistic means and strategies – through the syntagmatic, lexical and/or morphological specification – and, fourth, it is ontologically constrained as it applies to actions (e.g. *to read carefully*), states (e.g. *to be quietly standing*) and qualities (e.g. *bloody cold, nicely different*) (see Stosic 2019, 152–153 for further discussion). Fifth, the operation of diversification is of major importance for the characterization of manner because it provides specific qualitative features to a given substrate content by distinguishing actions, states and qualities of the same nature from each other as they are subject to a large variability of manifestations. Like qualifying substances according to Aristotle's definition (see Van de Velde, 2009), manner modification splits a given class of actions, states or qualities into sub-sets of instantiations that, although belonging to the general class at issue, are differentiated due to the presence of some distinctive feature (see *to walk* vs *to walk carefully*).

We argue that a transversal corpus exploration of manner in various semantic domains must be based on such a definition to encompass the wide variety of *linguistic forms* and *semantic values* which may encode it and to minimize selection biases.

3. Simultaneous interpreting as a cognitively constrained meaning equivalence task

While a productive trend of research has explored the Talmian paradigm in the motion domain using mostly elicitations and translated texts as a relevant type of cross-linguistic data (see for example: Berman, 1994; Cappelle, 2012; Fohlin, 2015; Khalifa, 2001; Slobin, 2004; Strömqvist & Verhoeven, 2004), simultaneous interpreting (SI) has to our knowledge almost never been used as empirical evidence to observe

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how a given set of languages expresses manner and/or other event components, and to test typological hypotheses (see however: Hijazo-Gascón, 2019). SI is a complex cross-linguistic task, described by Seeber (2011, 185) as: '[…] the process of cross-linguistic transfer of meaning in real time'. In a conference for instance, an interpreter receives a speech input through headphones in a given A language and has to 'simultaneously' rephrase the message into another B language for an audience unfamiliar with the A language. Unlike in written translation where texts may be proofread several times, the time window available to interpreters for conscious language choices is considerably reduced. More precisely, at the psycholinguistic level, comprehension and production tasks are performed with an extremely short 'ear-to-voice span', meaning that the target speech has to be uttered shortly after hearing the source speech (within a few seconds) (see Christoffels, 2004; Seeber, 2011). Such an overlap between comprehension and production results in a severe competition for common linguistic, memory and executive control resources (Diamond & Shreve, 2019; Seeber, 2011), which produces processing interference. Because of this, the SI task incurs a heavy cognitive load (see Tommola & Hyönä, 1990 for pupillometric evidence) which can be conceived of as the total mental activity imposed on working memory at a given time during performance of a task (Sweller, 1988). Because it bears on a precarious equilibrium of resource allocation between comprehension and production, the SI task is prone to cognitive saturation phenomena in the event of overload, that is, if the source-to-target language task requires more resources than are available to the interpreter (Gile, 2009). SI thus appears as a task in which the exertion of language competence is severely challenged in conditions of constrained performance.

Several factors are reputed to impact performance in SI (for a review see Seeber, 2011). IR, referring to the speed of the source language heard by the interpreter, appears as one of the most influential of these (Seeber, 2011). While IR – generally measured in words per minute (wpm) – has little impact on comprehension in a normal single-channel comprehension situation, it seems to have major consequences in SI since 'research indicates that omissions, substitutions and pronunciation errors (Pio, 2003) increase with higher rates of input, whereas anticipation accuracy decreases ' (Seeber, 2011, 186). It is worth noting that the recommended IR for SI is generally agreed to lie between 95 and 120 wpm. IR thus appears as an interesting indirect indicator of cognitive load levels since various degrees of IR presumably would incur various levels of information processing within the same reference time span.

Another set of variables impacting performance in SI are: the language combinations involved, directionality and structural differences between source and target languages. As for the first two, their impact on the average ear-to-voice span was empirically tested and recognized in a number of studies (see: Barik, 1973; Christoffels, 2004; Lee, 2002; Oléron & Nanpon, 1965). By contrast, structural or typological language asymmetries and/or specificities, whatever they may be, remain 'a hotly debated issue, dividing the interpreting research community' (Seeber, 2011, 186), some scholars arguing that they affect – others that they do not – the process of cross-linguistic transfer of meaning in SI. The lack of empirical studies on this question makes this debate difficult to resolve, although it is of major research interest. However, in a case study assessing cognitive load in the SI of two structurally different languages, namely German and English, displaying, respectively, SOV and

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SVO word order, Seeber (2011) showed that interpreting SVO into SOV structures is less resource-consuming than interpreting SOV into SVO structures.

On the basis of these considerations, we consider IR, the languages involved and their typological differences as well as directionality as variables in order to determine whether and how they impact the efficiency of processing and transferring the manner component when simultaneously interpreting from English into French, and *vice versa*. These variables were crossed with other more descriptive ones that arise from an in-depth linguistic analysis of the collected dataset. Several other factors that have been widely discussed in the relevant literature are nevertheless not considered here. For instance, even though the nature of the interpreted material is commonly acknowledged to influence performance in SI, we expect minimal variation for this factor since the 8 political speeches of our corpus were all delivered by high-level political representatives, in high-stakes national or international meetings or press conferences. As such, these speeches all draw on a register of *persuasion* by articulating political positions on social, economic, military or international issues.

4. Objectives

This study aimed at testing the general hypothesis of higher manner saliency in English as a SFL than in French as a VFL. The hypothesis testing scheme relies on a twofold approach to corpus data, intralinguistic (see §§ 6.1, 6.2 & 6.3.1) and cross-linguistic (see §§ 6.3.2).

4.1. Cross-domain encoding of manner

Our first objective is to show that the manner component is not limited to the motion domain, and that it may structure any conceptual field. We thus chose to explore a cross-domain corpus dealing with diverse political topics (see § 5.2.1 for details) and to focus on verbs as evidence that manner can be elaborated in various domains. We will provide an overview of this diversity by highlighting some of the verbal semantic classes that were most frequently found in our dataset in both languages. These were identified based loosely on Levin's (1993) classification of verbs of English.

4.2. Frequency of manner expressions

According to Slobin (2003), the more frequent verbal encoding of manner in SFLs as opposed to VFLs has been demonstrated in a variety of language use situations such as oral narrative, conversation or text translation (see on this: Slobin, 2004). Özçalıskan's (2004) cross-linguistic investigation also suggested that not only manner verbs but also manner adjuncts may be more frequent in SFLs, because of the greater cognitive saliency of manner in this type of languages. In line with such hypotheses, we posit that if verb-framed and satellite-framed patterns are active in other semantic domains, a globally scarcer count of manner verbs should be found in the French-spoken political speeches than in the English-spoken ones. We also explore whether a frequency effect is observed in manner adjuncts and in manner expressions taken together (see § 2.1).

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Note that while we use words as measure units to evaluate frequencies in both languages, this unit may be subject to biases since more or less analytical languages will conflate information in more or less formal units in discourse.

4.3. Manner specification of eventualities

In line with the adopted definition, manner specification may apply to actions/events, states and qualities (see § 2.3). Following Bach (1981), we use the term 'eventuality' to refer to both events and states. We considered only these two substrate types in this specific analysis in accordance with Talmy's event integration theory, excluding specifications of qualities, which are in any case infrequent in this corpus. A twofold exploration of manner modification of eventualities was deployed, both at the lexical and syntactic levels. As previously stated, due to language structural properties addressed by the typology of motion events and its possible extensions (see Introduction), one can expect a greater amount of manner specifications of eventualities in English than in French original productions. Moreover, as suggested by examples (30) and (31),[3] it could be predicted that English productions will manner-specify events mainly, or more often, through the verb, as opposed to French productions which should involve event specification mainly, or more often than English, through adjuncts.

(30) a. I **microwaved** the dishes three minutes each.
b. J'ai réchauffé les assiettes **au micro-onde** trois minutes chacune.
'I have heated up the plates in the microwave three minutes each'

(31) a. Marie **carved** the wood into a doll.
b. Marie a fabriqué une poupée **en sculptant du bois**.
'Marie made a doll by carving wood'

4.4. Manner transfer rates

If there is a global structural difference in how VFLs and SFLs instantiate manner, then manner expressions in the source language should be interpreted into manner-neutral forms (32 – *Obama corpus*) more often in the EF direction than in the FE direction. We will evaluate this hypothesis on the basis of *manner transfer rates* (MTRs): the percentage of source manner expressions that is interpreted by a manner expression in the target.

(32) a. (…) those who **trumpet** the benefits of globalization (…)
b. (…) ceux qui parlent des avantages de la mondialisation (…)
'those who speak of the advantages of globalisation'

Based on previous studies pertaining to event integration theory, one can also expect that manner-neutral forms in the source speeches could be interpreted into manner expressions (33 – *Macron corpus*), in particular in the FE direction.

[3]Example (31 a) is borrowed from Schirakowski (2022, 3).

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(33) a. (…) des années de progrès ont pris du retard (…)
'years of progress have been delayed'
b. (…) we **are lagging behind** now with them (…)

While we anticipate that the cognitive load undergone by the interpreters will cause semantic loss from the source to the target, interpreters may still be able to *add* manner in the target, especially in English due to the overall greater degree of manner saliency.

4.5. Directionality and effects of IR on manner transfer

According to Talmy, coding a semantic component in the main verb root or in a closed-class constituent could make it '[…] part of the semantic background where it attracts little direct attention'. On the contrary, coding a semantic component in an open-class constituent such as adjuncts supposedly makes it '[…] emerge into the foreground of attention […]'(Talmy, 2000, 128) creating more processing costs at the psycholinguistic level:

> Where a concept is backgrounded and thus is readily expressed, its informational content can be included in a sentence with apparently low cognitive cost – specifically, without much additional speaker effort or hearer attention.

Because manner may overall be coded more often at the verb level in SFLs while it may rather be coded through adverbial adjuncts in VFLs, the FE interpreters may be able to encode manner in the target at a lower processing cost than the EF interpreters. Given the known effects of IR on the cognitive load of interpreters (see § 3 above), higher levels of IRs may thus impact the encoding of manner target expressions less in the FE direction than in the EF direction if a supposedly lighter 'verbal packaging' of information is available to them more frequently. We tested this hypothesis by contrasting the processing of manner across various degrees of cognitive pressure (see § 5.1) in the two directions.

5. Methods

5.1. Data collection

We selected eight political speeches whose simultaneous interpretations were available in the public domain, either on the UN online media library or on Youtube.com. We retrieved the transcriptions of the original speeches from various governmental websites and kept only the text corresponding to the 15 first minutes of each speech, amounting to 4 hours of material (2 hours of source and target production per language). We then manually aligned the corresponding transcriptions to the audio recordings of the eight simultaneous interpretations. Finally, we automatically segmented the transcriptions into sentences with Excel and aligned the source segments with the corresponding target (interpreted) segments (F → E or E → F). The transcriptions of source and target speeches were all checked for accuracy and corrected when required. Recording dates, speakers, corpus size and IR of the collected data are presented in Table 1:

Note that the source speeches shown in Table 1 are ordered by their respective IR, ranging from 79 to 158 wpm for English, and from 93 to 149 wpm for French.

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Table 1. Collected data

L1	Speaker	Date	Size (words)	Input rate (wpm – words per second)
ENG	Hilary Clinton	28.07.2016	1186	79
	Barack Obama	20.09.2016	1668	111
	Theresa May	20.01.2017	2217	148
	David Cameron	10.11.2015	2349	158
FR	François Mitterrand	24.09.1990	1394	93
	Jacques Chirac	26.01.2005	1565	104
	Dominique De Villepin	14.02.2003	1852	123
	Emmanuel Macron	22.09.2020	2236	149

5.2. Inclusion criteria of original and interpreted speeches

5.2.1. Topics

To extend the study of manner to as many domains as possible, we chose high-stakes political speeches dealing with a diverse set of specific issues and domains (see Table 2).

5.2.2. Source input rate

To test if the interpreters' performance was impacted more in one of the two studied directions, we assembled a corpus with source speakers' average rates of delivery spanning across a range of 79 to 158 words per minute (wpm) (see Table 1), below and above the maximum wpm value of 120 advised by several specialists of SI (§ 3).

5.2.3. Number of performing interpreters

Due to the very demanding nature of SI, interpreters often have to relay each other every 30 minutes to ensure quality of the target speech. We excluded target speeches with interpreter relay so that the selected language productions reflect the performance and cognitive load of only one interpreter at a time.

Table 2. Variety of topics in the 8 original speeches

Speaker	Topics
H. Clinton	presidential campaign, Donald Trump, democracy in the USA, diversity in the USA, divisions among Americans, strengths of the US people, terrorism, US history.
B. Obama	minorities' rights, fight against terrorism, xenophobia, world democracy, side effects of globalizations, tax evasion, social justice, capitalism, inequalities.
T. May	Brexit, UK as an international nation, social reforms in the UK, dealing with supranational institutions, migration, foreign affairs, rejection of the EU.
D. Cameron	referendum on Brexit, reforming the EU, collaboration with Europe, the UK in WW2, military capacities, migratory flows, EU governance, free market.
F. Mitterrand	promotion of democracy, fall of the Berlin wall, the Cold War, settlement of conflicts, Kuwait War, international law, apartheid in South Africa.
J. Chirac	natural disasters, humanitarian aid, third-world development, wars, terrorism, free-market economy, taxing international transactions, fighting pandemics.
D. De Villepin	American resolution for a military invasion of Iraq, disarmament of Iraq, weapons of mass destruction, UN inspections in Iraq, favoring peace through the UN.
E. Macron	living with covid-19, mistrust in medicine and international organizations, rivalry between China and the USA, Iran and nuclear power, fighting Daesh, war in Mali.

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5.2.4. Ecological context of production of the interpretations

The 8 speeches selected for our study were all retrieved from online sources a posteriori; thus, the data have a high ecological validity. We evaluated ecological validity on a continuum between 'natural' and 'artificial' data, as proposed by Gilequin & Gries, 2009. Since it is usual for expert conference interpreters to work for organizations which most often record simultaneous interpretations for broadcasting, the very fact of being recorded does not in principle affect the 'naturalness' of the task itself. It can therefore be considered highly ecological, with no intervention from the researchers concerning the conditions in which the data were produced.

5.3. Coding principles

We systematically picked up and analyzed all manner expressions that fitted the definition proposed by Stosic (2011, 137; 2019, 162 – see § 2.3) whether they were construed via lexical, syntactic, morphological or grammatical means. We also analyzed how manner was processed by the interpreters by coding whether the manner component was *transferred*, *non-transferred* or *added* (when not originally denoted) from one language into the other. Table 3 summarizes the coding principles followed in this work.

While we identified manner expressions with an onomasiological approach on the basis of four main linguistic means (see § 2.1), we only considered manner verbs and manner adjuncts in quantitative analyses. This means that we did not consider *way*, *as* or the *-ly* suffix individually as one distinct manner expression if they appeared within a manner adjunct (*in a subtle way*, *as Parisians do*, *bluntly*), we only considered the adjunct, as a whole, to be a manner expression in this study. Since *as* merely participates in the construction of a manner adjunct and does not constitute the adjunct itself, counting both *as* and *as Parisians do* as two different manner expressions would have been problematic because it would have given such instantiations double weight in quantitative analyses.

6. Results

We first analyze how manner in general is encoded (§§ 6.1 & 6.2), then we turn to specifically how eventualities are specified with manner (§6.3.1) and transferred (§6.3.2). We conducted all analyses based on the number of tokens found (e.g. if the verb *to design* is expressed three times, we count three manner expressions).

6.1. Cross-domain encoding of manner

Systematic analysis of language data from our corpus evidences that manner elaborates eventualities in a number of semantic domains. We illustrate here the cross-domain nature of manner by foregrounding manner verbs (although manner can be specified with even more diverse semantic values at the syntactic level). Table 4 provides examples of manner specifications at the verb level across 10 semantic classes (loosely adapted from Levin, 1993), as identified in our corpus:

The domain of communication was particularly prominent in both languages in this corpus as political speakers often insist on how they communicate with citizens or other political actors.

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Table 3. Coding principles

Direction	Source form	Type of specification	Source mean	Target form	Processing type
F-E	*harceler* 'to harass'	manner verb	verbal-lexical	*to harass*	transferred
	trimer 'to slave over smth'	manner verb	verbal-lexical	*to work* (neutral)	non-transferred
	exprimer 'to express'	neutral verb	manner-neutral	*to assert*	added
	franchement 'frankly'	manner adjunct	syntactic	× (omitted)	non-transferred
	***comme** un dingue* 'like a madman'	grammatical	grammatical	***like** a madman*	transferred
	comme un dingue	manner adjunct	syntactic	***like a madman***	transferred
	d'un coup sec 'in a single blow'	manner adjunct	syntactic	*in a violent **way***	transferred
	*de **manière** directe* 'in a direct way'	lexical	lexical	*direct**ly***	transferred
	de manière directe	manner adjunct	syntactic	***directly***	transferred
E-F	*to trample*	manner verb	verbal-lexical	*piétiner* 'to trample'	transferred
	*to **over**simplify*	manner verb	morphological	*montrer* (neutral) 'to show'	non-transferred
	to send	neutral verb	manner-neutral	*faxer* 'to fax'	added
	bluntly	morphological	morphological	*abrupte**ment*** **'abruptly'**	transferred
	bluntly	manner adjunct	syntactic	***abruptement***	transferred
	with a poke	manner adjunct	syntactic	*beaucoup* 'a lot' (neutral)	non-transferred
	as Parisians do	manner adjunct	syntactic	***comme à Paris*** 'like in Paris'	transferred
	in a subtle way	manner adjunct	syntactic	***subtilement*** 'subtly'	transferred

6.2. Manner frequency

As the 8 speeches varied in the number of words produced, we assessed the frequency of manner by standardizing, for each speaker, the number of manner expressions (in tokens) as a ratio per 1000 words. To this purpose, all sorts of manner specifications, whether applying to actions, states or qualities (see § 2.3), were taken into account. Because we are particularly interested in how eventualities are specified in French and English, we then focused specifically on the one hand on the frequency of manner verbs, and on the other hand on the frequency of those adjuncts that specify eventualities only (e.g. *to trade freely,* May), excluding those which specify qualities (e.g. *a democratically elected leader,* Obama). Note however that the specification of eventualities is the case of 95% of all manner expressions in French, and 89% in English. A total of 491 manner expressions were identified, 221 in French and 270 in English. Table 5 presents each speaker's standardized frequency as well as the average and median frequencies for each language:

On the basis of words as a comparison unit, manner expressions (MEs) were used more frequently in English than in French with a mean frequency of 37 (SD = 4.8) expressions per 1000 words, as compared to 32 (SD = 3.8) expressions in French on

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Table 4. Diversity of manner verbs

Semantic class	French	English
communication	*édicter* 'to decree'; *évoquer* 'to mention'; *prier* 'to ask with insistance'; *exiger* 'to require absolutely'; *interroger* 'to interrogate'; *affirmer* 'to assert'; *préciser* 'to express precisely'; *mettre à plat* 'to expound smth'	*to have words with*; *to recount*; *to demand*; *to trumpet*; *to set out*; *to outline*; *to argue*; *to explain*; *to discuss*
creation & transformation	*construire* 'to build'; *bâtir* 'to build'; *concevoir* 'to conceive'	*to build*; *to establish*; *to forge*; *to shape*; *to develop*; *to reform*; *to ebb and flow*
mental operations	*guetter* 'to watch out'; *attacher* 'to bind emotionally'	*to watch*; *to reflect*; *to cherish*; *to recognize*
social interactions	*coopérer* 'to cooperate'; *s'entendre* 'to agree with'	*to compromise*: *to stand up to*; *to coordinate*; *to negotiate*; *to commemorate*
motion & location	*circuler* 'to circulate'; *vaciller* 'to totter'; *faire irruption* 'to burst in'; *échapper à* 'to run away from';	*to hang*; *to run*; *to flow*; *to travel*; *to lay*; *to fly*
combining & attaching	*combiner* 'to combine'; *s'accumuler* 'to accumulate'	*to summon*; *to imbed*; *to imply*
destruction	*ravager* 'to devastate'; *décimer* 'to decimate'	*to repeal*
judgement	*saluer* 'to acknowledge positively'	*to celebrate*
choice	*voter* 'to decide by vote'; *trancher* 'to decide vigorously'	*to vote*
disassembling	×	*to pull apart*; *to fray*

Table 5. Specific and overall frequencies of MEs

		M EXPRESSIONS		M VERBS		M ADJUNCTS	
L1	SPEAKER	#	SF* ‰	#	SF ‰	#	SF ‰
FR	F. Mitterrand	43	31	27	19	12	9
	J. Chirac	60	38	28	18	28	18
	D. De Villepin	51	28	23	12	26	14
	E. Macron	67	30	38	17	28	13
	total	221	31	116	16	94	13
	mean frequency (SD*)		**32 (3.8)**		**17 (2.7)**		**14 (3.2)**
	median frequency		**30.5**		**17.5**		**13.5**
ENG	H. Clinton	46	39	27	23	18	15
	B. Obama	61	37	34	20	19	11
	T. May	94	42	48	22	32	14
	D. Cameron	69	29	47	20	16	7
	total	270	36	156	21	85	11
	mean frequency (SD)		**37 (4.8)**		**21 (1.3)**		**12 (3.1)**
	median frequency		**38**		**21**		**12.5**

SF*: standardized frequency (per 1000 words); SD*: standard deviation; For each of the two studied languages, bold values correspond to mean frequencies (and their standard deviation), or median frequencies, of either manner expressions in general or manner verbs, or adjuncts, specifically.

average, meaning that MEs were 15.6% more frequent in English than in French (i.e. ((37–32)*100/32)). The median values (Eng: 38; Fr: 30.5) emphasize that difference and could be more representative of general tendencies. A G-test goodness of fit (also known as the likelihood ratio test) was applied to the French and English

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data to see if this difference was significant. MEs occurred more frequently in the English data (270 occurrences) than in French (221 occurrences) and this difference was (marginally) significant (chi-squared = 3.1343, p-value = 0.07666).

The analysis of manner verbs and of adjuncts revealed on the one hand that the overall higher frequency of MEs in English was due to a 23.5% higher frequency of manner verbs in this language (M = 21, SD = 1.3) compared to French (M = 17, SD = 2.7) (i.e. ((21–17)*100/17)), and this difference was significant (chi-squared- = 4.4123, p-value = 0.03568). On the other hand, although manner adjuncts tended to be 16.7% more frequent in French (M = 14, SD = 3.1) than in English (M = 12, SD = 3.1) (i.e. ((14–12)*100/12)), this difference was not significant (chi-squared- = 0.88437, p-value = 0.347).

6.3. *Types of manner specification of eventualities and transfer of eventualities*

First, we assess how eventualities are specified with manner in the source speeches (§ 6.3.1) and whether they are transferred with the manner component from source to target in the two directions (§ 6.3.2): from English to French (EF), and from French to English (FE).

6.3.1. *Manner specification of eventualities*

To determine if the speakers (politicians) in either of the two languages favor either manner verbs or manner adjuncts to specify manner in event descriptions, we again considered all manner verbs but only those manner adjuncts which specify either an action or a state. Figure 2 presents each speaker's use of manner verbs and manner adjuncts as well as the mean values for each language.

While both languages presented an overall preference for coding manner at the verb level in event descriptions, this preference was absolute in English, with all

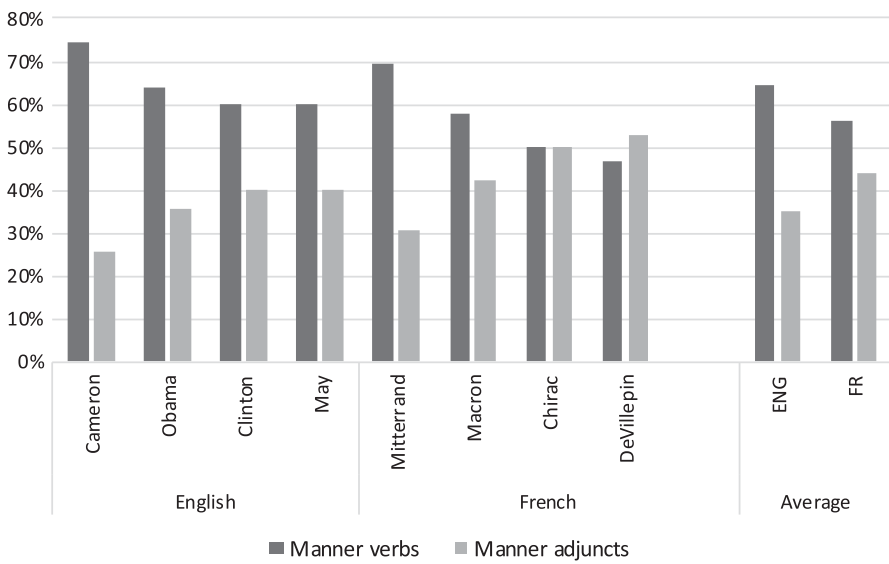

Figure 2. Lexical vs syntactic specification of manner in English and French.

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four speakers favoring manner verbs, while it was relative in French, with one speaker using verbs and adjuncts in equal proportions (*Chirac*) and one speaker actually favoring adjuncts over verbs (*De Villepin*). Moreover, the average preference for manner verbs (M = 65%, SD = 6.1) in English speakers was higher than in speakers of French (M = 56%, SD = 8.5) with a significant 9-point difference between the two languages (chi-squared = 4.4123, p-value = 0.03568; see § 6.2).

6.3.2. Transferring the manner component in FE and EF SI

One aim of the present study was to evaluate whether manner is processed differently when specifying eventualities in two interpreting directions: from French into English (FE) or from English into French (EF), depending on the IR variable.

Table 6 presents raw counts of *transferred* and *added* manner verbs and adjuncts for each interpreter. For each manner token category (manner expressions/ manner verbs /manner adjuncts), and in each direction, bold values correspond to either totals of found tokens across speakers and interpreters, or they correspond to mean values (in percentage) of transferred manner.

The data show that manner verbs (MVs) were on average transferred more frequently in the FE direction (59%) than in the EF direction (46%), as opposed to manner adjuncts (MAs) (76% versus 71%, respectively). A chi-square test was applied to statistically test the crosslinguistic transfer of MVs and MAs from English to French and vice versa. FE interpreters transferred MVs significantly more often than EF interpreters (chi-squared = 4.7311, df = 1, p = 0.02962). In contrast, there was no significant difference between EF and FE interpreters with respect to MAs (chi-squared = 1.1712, df = 1, p = 0.2792).

Figure 3 shows how manner-modified eventualities, as a whole, are transferred from one language into the other (merging both MVs and MAs) depending on the respective input rate (IR) of each speech.

The first fact highlighted by these data is that manner was *transferred* on average 14 points more in the FE direction (M = 67%) than in the EF direction (M = 55%) (see Table 6). More specifically, three FE interpreters out of four (except Mitterrand's interpreter) transferred manner more often than EF interpreters despite having to deal with similar (*Macron vs May*) or higher IRs (*De Villepin vs Obama*). However, dealing with the lowest of all EF IRs (79 wpm), Clinton's interpreter was able to transfer up to 71% of the source amount of manner, at a level that is comparable to those of most FE interpreters. Finally, while the manner transfer rates (MTRs) of the EF interpreters seemed to decrease as a function of increased IRs, the FE interpreters did not seem sensitive to this variable.

With respect to addition rates (ARs), as illustrated in Figure 4, they were obtained from the percentage that each interpreter's additions represent compared to the number of manner specifiers (MVs and MAs) originally encoded in each source speech. We compare ARs with loss rates (the reverse equivalent of MTRs) in order to assess whether MEs added by the interpreters 'compensate' for MEs that have not been transferred.

As can be deduced from the previous figure (Figure 3) on manner transfer, losses are sharper in the EF (av.45%) direction than in the FE direction (av.33%), while on the contrary additions are less numerous in EF (av. 11%) than in FE (av. 23%). On the whole, an interesting phenomenon is highlighted: while in the FE direction manner

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Table 6. Crosslinguistic transfer of manner verbs and manner adjuncts

		French – English					English – French				
M Exp. type	Direction	Mitterrand	Chirac	De Villepin	Macron	Total/Average	Clinton	Obama	May	Cameron	Total/Average
Manner Verbs	Source #	27	28	23	38	**116**	27	33	48	47	**155**
	Transferred #	14	17	16	21	**68**	16	14	25	14	**69**
	Transferred %	52%	61%	70%	55%	av.**59%**	59%	42%	52%	30%	av.**46%**
	Added Target #	4	7	4	15	**30**	5	3	1	1	**10**
	Total Target #	18	24	20	36	**98**	21	17	26	15	**79**
Manner Adjuncts	Source #	12	28	26	28	**94**	18	19	32	16	**85**
	Transferred #	8	22	22	21	**73**	16	16	19	8	**59**
	Transferred %	67%	79%	85%	75%	av.**76%**	89%	84%	59%	50%	av.**71%**
	Added Target #	4	4	5	5	**18**	0	0	4	4	**8**
	Total Target #	12	26	27	26	**91**	16	16	23	12	**67**
MEVs	Global Transf %	56%	70%	78%	64%	**av.67%**	71%	58%	55%	35%	**av.55%**

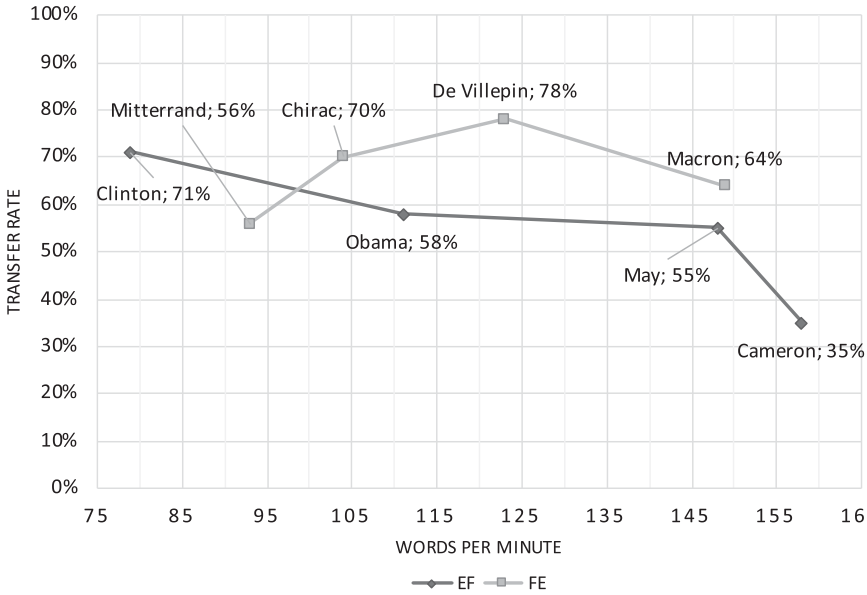

Figure 3. Manner specification of eventualities transfer rates.

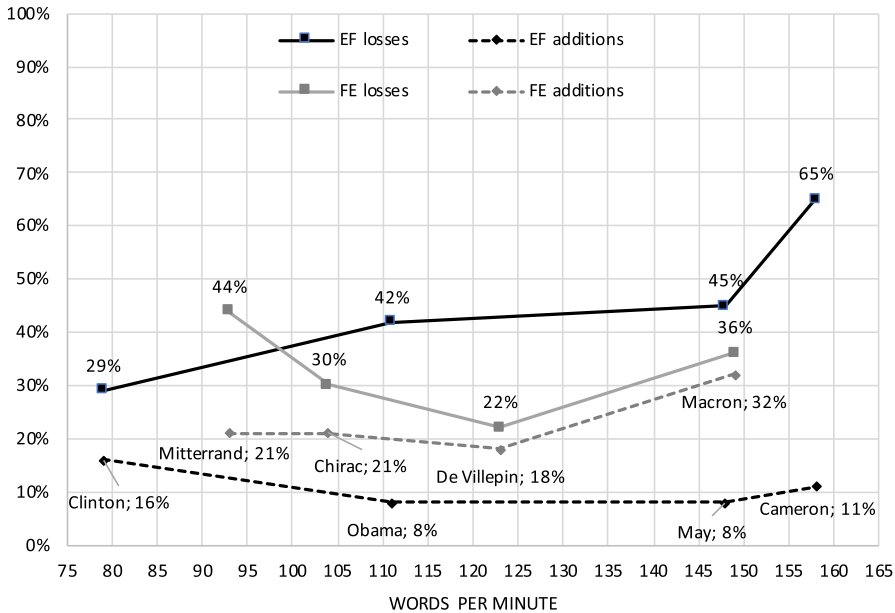

Figure 4. Addition rates compared to loss rates.

additions largely counterbalance losses, they do so very marginally in the EF direction. Finally, although manner is predominantly lost at the verb level in both directions (verbal losses represent 73% of all losses in the EF direction, and 69% in the FE direction), FE interpreters' 48 additions are 63% verbal, meaning that the FE

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interpreters are able to compensate for losses mainly by adding manner *verbally* that is, by interpreting a manner-neutral source segment (34a – *Macron corpus*) using a verb that expresses manner (34b – *Macron corpus*):

(34) a. (…) la France a toujours été au rendez-vous de l'effectivité des lignes rouges (…)
'France has always been present for the effectivity of red lines'
b. (…) France has always been prepared to **enforce** the effectiveness of its red lines (…)

7. Discussion

Moving away from a strictly verb-centered analysis, the onomasiological approach of this study, as applied to an independent corpus of EF and FE SI, has enabled us to assess manner specification of eventualities in both source and target productions, whether conveyed by verbs or adjuncts, in relation to Talmy's event integration theory. Overall, it is argued that English speakers tend to specify manner 15.6% more often than French speakers (cf. § 6.2). However, this general tendency was only marginally significant (G-test goodness of fit: chi-squared = 3.1343, p = 0.07666; see § 6.2), suggesting that this difference may represent an artifact due to the formal asymmetries between English and French (cf. § 4.2). Although MVs were more frequent in English than in French (23.5% more), MAs were only slightly more frequent in French (16.7% more), but the latter difference was not significant. This leads us to argue that when all means of expression are taken into account, French and English speakers overall differ very little in how much and how often they describe the manner dimension in discourse, regardless of the involved structures (verbs or adjuncts). Although these results call for a finer-grained evaluation of frequency, such highly similar tendencies in English and French suggest that the difference might be limited to *how* manner is expressed rather than to *how much* it is expressed. The data also revealed a more predominantly verbal strategy in English compared to a more mixed strategy in French in specifying eventualities.

Also contrary to what could have been expected from a simple generalization of Talmy's well-known opposition between SFLs and VFLs, both French and English speakers appeared to preferentially express manner overall at the verb level rather than at the level of adjuncts. This finding is further evidence that verbs may, against all odds, be the most prevalent way of expressing manner in French, which Minoccheri and Stosic (2022) already observed in slightly more motion-oriented corpora using a similar onomasiological approach. Our cross-domain study suggests that this hypothesis may hold true across the board in French, not just in the domain of motion, in domains as diverse as communication, creation, mental activities or social interactions (cf. § 6.1). Our findings thus contradict a general assumption that expressing manner at the verb level could be heavily and univocally constrained in French as a VFL in any semantic domain.

Although the French data contradicted expectations of a generalized low manner-salient 'VFL profile' as to the verbal expression of manner, we nevertheless observed qualitative and quantitative differences in the extent to which speakers of the two languages expressed manner in the verb root. Firstly, French speakers made a more

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balanced use of MVs and MAs on average (verbs: M = 56%, adjuncts: M = 44%, SD = 8.5) than English speakers did (verbs: M = 65%, adjuncts: M = 35%, SD = 6.1). Moreover, while the preference for verbs appeared systematic in every speaker in English (see Figure 2), it was only relative in French speakers with Chirac using verbs and adjuncts equally, and De Villepin in fact favoring adjuncts over verbs. In addition, we noticed that most of the numerous (48) MEs *added* by the FE interpreters were encoded with a verb (63%). Finally, although the use of words as a comparison unit is subject to potential biases due to formal asymmetries between more (French) or less (English) analytical languages (cf. § 4.2), we found MVs to be 23.5% more frequent per 1000 words in English (M = 21, SD = 1.3) than in French (M = 17, SD = 2.7) speakers (see Table 5) and this difference was more strongly significant (G-test goodness of fit: chi-squared = 4.4123, p-value = 0.03568; see § 6.2) than at the general level of MEs. The fact that English appeared even more verb-oriented than French in specifying eventualities with manner could be revealing of a persistent higher flexibility of English for instantiating manner in discourse through verbs. Conversely, even if French speakers made abundant use of MVs overall, French may still be more semantically or syntactically restricted than English. One possible reason for higher verbal flexibility with respect to manner in English, among several other hypotheses, could be linked to the capacity of English to easily convert nouns into verbs (Vaneva & Bojadjiev, 2020) as in example (35) compared to example (36) in French (our translation). The original example was quoted from Talmy's work (Talmy, 2000, 221):

(35) The two accompanying figures **diagram** these components (…).
(36) Les deux figures suivantes présentent ces composants **sous la forme de diagrammes**.
'The two accompanying figures present these components in the form of diagrams'

This difference, although smaller than expected, could be further explored in corpus studies with precise semantic-syntactic analyses to uncover if it originates from different lexicalization patterns in event descriptions between English and French, and if it extends to several semantic domains. Such analyses could unveil typological differences akin to, or distinct from, those identified by Talmy (1985, 2000).

Regarding the cross-linguistic part of our investigation, it showed that FE interpreters performed better in the amount of manner that they were able to transfer into the target language, and this appeared to result exclusively from an advantage in transferring verbally encoded manner (chi-square test: X-squared = 4.7311, df = 1, p-value = 0.02962; see § 6.3.2) while performance in transferring syntactically encoded manner (MAs) did not appear significantly different (chi-square test: X-squared = 1.1712, df = 1, p-value = 0.2792; see 6.3.2) between the two groups. This result is particularly interesting because it suggests that interpreters performing in the VFL (French) to SFL (English) direction benefit from a higher verbal codability of manner in the target linguistic system than the SFL (English) to VFL (French) interpreters do, and this was predicted by the structural properties of these typological types that have been highlighted in the framework of Talmy's event integration theory. The fact that syntactically encoded manner displayed no significant transfer difference between the two directions reinforces this hypothesis as there is in principle no reason for EF interpreters to be more restricted than FE interpreters in

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instantiating MAs which are widely available in French under many forms (see Moline & Stosic, 2016 for an extensive account). Nevertheless, although it is difficult to isolate the competence-related factor of typologically determined structural asymmetries between English and French from the performance-related factor of varying cognitive loads between interpreters, we observed that, placed in presumably the most comfortable performance condition (only 79 wpm) of all four EF interpreters, Hilary Clinton's interpreter was able to transfer manner from English into French at a rather high rate (71%), one that is comparable to those attained by most FE interpreters (see Figure 3). This finding shows that French is not irremediably impeded in expressing manner when interpreting from English, but that doing so becomes increasingly difficult with higher levels of cognitive load while it remains possible in the FE direction for most interpreters.

The comparison of the respective 'resistance' of manner to cognitive load between the two directions shows that manner target encoding rates in the FE direction do not depend on IRs – a result that seems especially striking compared to the apparently negative impact of increased IRs on the processing of manner in the EF direction (see Figure 3). Moreover, the data show that the FE interpreters add twice as much manner in the target, even when it was not mentioned in the source, than the EF interpreters do (Macron's interpreter added much more manner than any other interpreter despite a very high 149 words per minute IR), and thus somehow 'compensate' in part, despite the cognitive load they have to deal with, for the amount of source manner that has not been transferred, while EF interpreters' additions only marginally compensate for losses. From this specific angle, FE interpreters express almost as much manner in the target as was in the source, while EF productions can be seen as much less semantically detailed regarding manner. The fact that the FE interpreters both achieve higher MTRs and add manner more in event descriptions regardless of IRs suggests that the transfer of manner could be less sensitive to cognitive pressure in the FE direction. This could mean that manner is overall more codable and cognitively more salient and accessible when producing English than when producing French, in potentially any semantic domain, and thus can be retrieved more easily from memory and integrated more readily during discourse planning. Although our study does not allow a direct measure of cognitive load, and a potential resource-availability bias cannot therefore be discarded, this explanatory hypothesis appears supported by the fact that not only the cross-linguistic analysis (see § 6.3.2) but also the intralinguistic analysis (see §§ 6.2 & 6.3.1) point to a differential of manner codability at the verb level between English speakers and French speakers. These analyses have highlighted that source political (English) speakers and French to English interpreters show, respectively, a stronger preference for coding manner verbally and higher performance specifically in transferring verbally encoded manner. These results support the hypothesis of higher cognitive salience and accessibility of manner in interpreters producing English since, according to Talmy (2000, 128), the instantiation of manner in SFL speakers at 'low cognitive cost' is fundamentally linked to the 'backgrounding of information' (cf. § 4.5) that is specific to the verbal coding of semantic components. As an alternative to this differential processing hypothesis, it must also be considered that EF and FE interpreters may simply not have to deal with comparable levels of cognitive load or that crucial uncontrolled competence-related factors are at play in differentiating performance between the two directions. These biases, which need to be addressed in future research, arise mainly due to the use of IR as an indirect

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indicator of cognitive load and from the potential influence of the acquisitional status of the source and target languages involved in each performance.

With respect to IR as an indirect indicator of cognitive load levels, although it can reasonably be understood as providing insight into the effects of cognitive pressure on competence and performance, its very nature limits comparability between the two directions. Not only is it indirect, and thus is rendered imprecise by other performance impacting parameters such as language dominance or fatigue, but the information processing levels it captures are also likely to be distinct in each direction since in a less analytical language such as English, an identical number of words per minute will in fact represent more information to be processed (and thus a higher cognitive load) since semantic information is conflated into fewer units in discourse than in French which uses more clitics (Cochrane, 1995). Such limitations could be overcome in future research by using more robust measures of cognitive load such as pupillometry (Seeber, 2013), which is believed to reflect cognitive effort in speech processing.

With respect to the interpreters' bilingual profile, our protocol design did not make it possible to control for the acquisitional status of the source and target languages (L1/L2). Four different source-target configurations may occur in SI, which would most likely each affect performance differently, namely: L2 to L1 and L1 to L2 as previously mentioned, but also L1 to L1, in the case of early high-level bilinguals, and even L2 to L2 in the case where an interpreter with strong mastery of two non-native languages interprets from one into the other. Despite the skills and expertise that SI requires (see Alves, 2015) and although there is no consensus on the influence of the target language's acquisitional status in SI (see Christoffels & De Groot, 2005), it can be expected that interpreters will sometimes be led to activate more the structures of the language that is more deeply entrenched in their brain as is sometimes observed in bilinguals (Hernandez et al., 2005), especially due to the high cognitive load that is inherent to the SI task (see § 3). For this reason, SI productions into a L1 or into an L2 may not be comparable in terms of the competence resources activated. Moreover, some evidence has suggested that the L2 to L1 configuration generates less cognitive load than the reverse (Seeber, 2015). Given the possible interactions between these various acquisitional configurations and the cognitive load variable, one may wonder for instance if the low performance of Cameron's interpreter (see Figure 3) was due to a threshold effect of IR or if it could be due to the interpreter being in a L1 to L2 configuration and thus disadvantaged in producing output in French compared to the other interpreters who may have been in the L2 to L1 configuration. Similarly, the performance of Mitterrand's interpreter may reflect that of a French native interpreting into L2 English (L1 to L2), which could explain why their performance was, surprisingly, much lower than that of the other three FE performances despite being placed in the most comfortable IR condition. Conversely, the high transfer rates of De Villepin's interpreter in the FE direction (see Table 6 and Figure 3) may indicate a L2 to L1 performance. Direct collection of data in professional settings with personal questionnaires would make it possible to homogenize subject samples and to retain only one type of configuration, ideally the L2 to L1 configuration. This is the configuration that would likely most fully give rise to language-specific accessibility and cognitive salience effects as the L1 is the most deeply entrenched linguistic system, and may therefore allow more automated access and use of the structural properties of the analyzed target language.

For future research, it would be interesting to evaluate more narrowly, on larger subject sample sizes, and with subjects with more comparable cognitive loads (using

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more direct measures of it) and linguistic profiles, whether the higher resistance of manner to cognitive load during FE interpreting is a robust effect. More specifically, it would be interesting to track how verbal and syntactic transfer occur, and especially, to further test if verbal encoding of manner is more resistant to different cognitive pressures.

Finally, our findings quite interestingly contradicted the assumption that manner would be processed at a lower cognitive cost at the verb level than at the level of adjuncts (Slobin, 2006; Talmy, 2000), at least in SI, since manner within adjuncts was always transferred at higher rates than manner within verbs in both directions and was comparably affected by the IR variable.

8. Conclusion

In this study, the first aim was to investigate the linguistic effects of potentially generalized structural differences between English as a SFL and French as a VFL on the coding of manner in event descriptions, beyond the domain of motion, based on Talmy's event integration theory. The main hypothesis was that English should code manner mainly in the verb root and French mainly via adjuncts, and that overall manner should be more frequently expressed in English (irrespective of the means of expression). The second aim was to explore whether manner 'survives' the cognitively complex task of SI more when transferring meaning into English due to its potentially higher cognitive salience and low-cost processing in possibly any semantic domain.

Although in this cross-domain study manner expressions did not appear to be markedly more frequent in English than in French, and manner coding in the verbal root was unexpectedly very much present in both languages, the findings suggest a significantly stronger tendency for verbal coding in English than in French. This suggests that S-framed and V-framed patterns or at least language-specific structural patterns are at play in domains other than motion. Cross-linguistically, the results pointed to a cognitive and/or linguistic advantage on the part of FE interpreters, compared to EF interpreters, in conveying the sense of manner irrespective of cognitive load from source to target speeches. This suggests that, when adapting a message into English, manner is more easily retrievable, and/or more swiftly integrated in speech planning due to its higher cognitive salience.

Although these results appear promising, two methodological limitations will need to be addressed in future research. First, our protocol design did not enable us to control the interpreters' bilingual profile due to a-posteriori data collection online, hence a potential bias linked to the age of acquisition of the interpreters' source and target languages. Secondly, IR as an indirect indicator of cognitive load is sensitive to uncontrolled parameters affecting it such as the source-target configuration (with L1 to L2 being potentially more costly than L2 to L1, see Seeber, 2015).

This study has highlighted the potential of a cross-domain approach for the study of manner in event descriptions and the interest of studying language processing from a cross-linguistic perspective, in order to evaluate the representational anchoring of manner in the interpreter's mind. As our findings challenge the view of a strongly marked difference between English and French while also pointing to different levels of verbal codability of manner, they call both for more domain-specific (communication, creation, social interactions, mental operations, destruction, etc.) onomasiological explorations (see § 2) and for in-depth semantic-syntactic

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analyses to uncover distinct structural patterns differentiating French and English beyond motion. Moreover, the use of SI data has been fruitful to observe how manner is processed cross-linguistically between two structurally distinct languages and to observe which meaning components are favored when one has to translate under high cognitive pressure. The cross-linguistic part of our study revealed a higher cognitive salience of manner in English-speaking subjects, but also showed that a more experimentally controlled study on transfer with a more direct measure of cognitive load is needed (for a review of various types of cognitive load measures, see Seeber, 2013). Such an approach will make it possible to further test if interpreters with equivalent linguistic profiles and comparable cognitive loads access and instantiate the sense of manner more swiftly when adapting meaning to a SFL.

Data availability statement. The data supporting the results reported in the article can be found at: https://osf.io/vg73u/?view_only=cb71e5c7c8c4405b82926de326e35fd6. The original and interpreted speeches have also been uploaded to the parallel online searchable multilingual corpus ParCoLab, freely available at: http://parcolab.univ-tlse2.fr/en/about/content/.

Acknowledgements. We thank the volume editors and the anonymous reviewers for their helpful comments on earlier versions of the paper. We also wish to thank Basilio Calderone from the CLLE laboratory in Toulouse for his guidance and support with statistical analyses, as well as Elisabeth Rowley-Jolivet for her careful proofreading of the manuscript.

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Cite this article: Combe, C., & Stosic, D. (2024). Processing manner under high cognitive pressure: Evidence from French–English and English–French simultaneous interpreting, *Language and Cognition* 16: 1105–1133. https://doi.org/10.1017/langcog.2023.74