

Cross-linguistic interplay of lexical aspect and (non-)literalness

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1 Introduction

Verbs often exhibit non-literal meanings, besides their literal senses. Recent literature has suggested interesting correlations between (non-)literalness and key dimensions of verb semantics. One tendency observed for various languages is that **linguistic material that is optional** when a verb is used **literally** may **become compulsory** for **non-literal** senses. For example, McNally and Spalek (2017) observe for English that non-literal interpretations sometimes require a particle that is optional in the literal use; e.g. their (1a) requires *off* in order for *cut* to be used as a paraphrase of *stop*. We observe similar contrasts for German (that uses verb particles like English); e.g. *steigen* ‘raise’ can be used without particle in (1c), but not in (1b).

- (1) a. France #**cut**/(OK/?)**cut off** the extradition of ETA members. (English)
b. In ihm **ist** Wut #**gestiegen**/OK **aufgestiegen**. ‘He started to feel angry.’ (German)
c. Der Ballon ist (auf)gestiegen. ‘The balloon rose.’

A second tendency is that non-literal extensions of verbal meaning regularly go along with a change in the lexical aspect of the verb phrase (VP): (i) Verbs which are **dynamic** in their **literal** sense become **stative** in their **non-literal** sense. A famous example is the fictive motion use of motion verbs (*The road runs through the valley*) (Talmy 1996, Matlock 2004). (ii) Verbs which are run-of-the-mill **accomplishments** or predicates of **variable telicity** under their **literal** use show properties of **achievements** in their **non-literal** use. For example, Spalek (2014) describes Spanish change-of-state verbs which lose their gradability in non-literal uses; in (2a), the adverbial of completion is acceptable with the literal use of *romper* but not with the non-literal use. Also, dynamic VPs may be embedded by aspectual verbs when used literally, but not when used non-literally (thus similar to achievements in this respect), cf. the French contrast in (2b).

- (2) a. #La amistad con Bojan/OK su ligamento se **rompió** parcialmente. (Spanish)
‘The friendship with Bojan/his ligament broke (off)/tore partially.’
b. Le ballon/#sa colère a arrêté de monter. ‘The balloon/his anger stopped raising.’
(French)

2 Hypotheses

We believe that the two tendencies illustrated above are quite significant, and inter-related at a deeper level, in that verb particles losing their optionality under the non-literal meaning have been argued to contribute to changing the lexical aspect/event structure of the VP it is part of (Smollett 2005, Roßdeutscher 2011, 2015); e.g. *aufsteigen* is easier to combine with an *in*-adverbial than *steigen*, *cut* has a conative use that *cut off* does not have, etc. To our knowledge, however, these tendencies have not been supported by large-scale empirical experiments yet. We report a set of experiments on French verbs and German particle verbs (with particles *ab*, *an*, *auf*, *aus*) and their base verb counterparts. Our goal is to evaluate the empirical scope of hypotheses H1–H3 below. As to our knowledge, H1 and H3 are new; H2 has been suggested before but not yet been supported by empirical experiments.

- (H1)** In German, non-literal senses prefer particle verbs (PVs) rather than the corresponding base verbs (BVs); BVs prefer literal over non-literal senses.
- (H2)** The German particles under study (*ab*, *an*, *auf*, *aus*) contribute to the aspectual profile of the VP they enter in, and do so in a particle-specific way (cf. Roßdeutscher 2011, 2015, a.o.).
- (H3)** *strong version*: In non-literal senses, verbs tend to be either strictly stative (with no dynamic felicitous use) or strictly telic ('rigid' accomplishments with no atelic use or achievements).
weak version: In literal senses, verbs are aspectually more flexible (i.e., they enter a broader range of aspectual frames) in comparison to their non-literal senses.

3 Experiments

EXP 1 empirically tests hypothesis H1. Our dataset comprises 16 German base verbs (BVs), and a systematic combination of these BVs with the 4 particles under study. For all base and particle verbs, we extracted sentences from the German COW web corpus and automatically assigned a degree of (non-)literalness to the sentences by applying the classifier from Köper & Schulte im Walde (2016). A random subset of 10 literal and 10 non-literal sentences for the 16 BVs, as well as 20 literal and 20 non-literal sentences for each PV, a total of 860 sentences (325 for BVs and 535 for PVs), was then manually annotated on the degree of literalness on a [0-5] scale (0=literal; 5=non-literal) by three annotators, to ensure a reliable distinction between literal and non-literal language. 65.8% of the BV sentences were judged literal, while only 48.4% of the PV sentences were judged literal. We conclude that for the German verbs under study, hypothesis H1 is confirmed.

EXP 2 tests the strong version of H3 for French. The dataset is composed of 167 frequent French verbs chosen in such a way that the four Vendlerian aspectual classes were in good balance. For these verbs, we extracted (i) each sense as defined in the lexical resource 'Les Verbes Français' (LVF, François et al. 2007), for a total of 1199 verb senses, (ii) the exemplifying sentences provided by the LVF for each of these 1199 senses. A semanticist annotated the sentences according to a fine-grained aspectual classification into 8 aspectual subclasses. Table 1 gives examples for each subclass, some of the tests used in the classification, and the most expected values for each subclass on a [0,5] scale (0=unacceptable; 5=acceptable). We also extracted the LVF sense classification according to (non-)literalness for all sentences, and selected the subset of lemmas which (i) have literal and non-literal verb senses and (ii) have verb senses in both the 'extreme' aspectual classes X1, X6, X7 and X8 and the 'in-between' aspectual classes X2–X5. We found that in most cases (60%, 32 lemmas) the percentage of non-literal verb senses in 'extreme' aspectual classes was su-

perior to the percentage of literal verb senses. Figure 1a shows the distribution of the literal vs. non-literal senses across the 8 aspectual classes. We take these data to offer support for the strong version of H3.

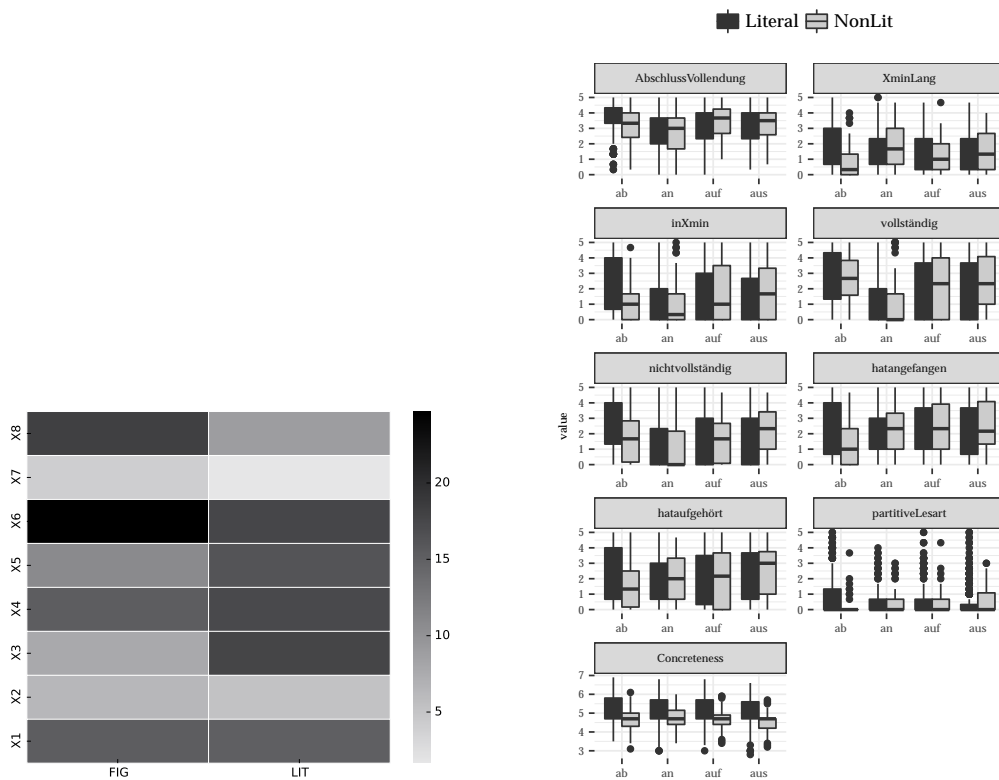
EXP 3–5 aim to bring together the cross-linguistic explorations in a more parallel fashion for French and German, and going beyond a single-annotator setup and a rigid aspectual categorisation. **Dataset.** For French, we selected 57 verbs out of the 167 lemmas used in EXP 2, and added more verbs, for a total of 1200 senses. For German, we extracted 1905 sentences from GermaNet 9 across 1099 different *ab/an/aus/auf*-PVs, with a good balance across particles. **Annotation.** 3 German and French annotators classified the German/French sentences according to (non-)literalness on a [0-5] scale. For aspect, the task was to evaluate the acceptability of key aspectual properties. **Methods and results.** **EXP 3** aims to test the weak version of H3. We approximated the aspectual flexibility of each verb sense by summing the annotators' scores for 5 of the aspectual tasks. We then computed for each lemma the average of the sums obtained for each of the lemma's sense, and only kept lemmas which had both literal and non-literal senses according to the annotators' scores. For 62% of the French lemmas, the literal average was greater than the figurative average. For German, this was the case for only 54%. The weak version of H3 is thus supported for French only. **EXP 4** tests the strong version of H3. The aspectual profile for each verb sense was approximated by subtracting the value I for the *inXmin* task from the value F for the *forXmin*. Verb senses for which $F-I > 0$ were mapped to *ate(lic)*, those for which $-0.3 < F-I \leq 0$ were mapped to *var(iable)*, and those for which $F-I < -0.3$ were mapped to *h(ighly)te(lic)*. Figure 1d shows the distribution obtained for literal vs. non-literal verb senses for French. Conformly to the strong version of H3, non-literal senses are less present in the *var* class than literal senses. However, the results for EXP 4 on the German data do not show the same tendency. **EXP 5** aims to provide evidence for H2 and to give a shape to the aspectual profile of *ab*, *an*, *auf*, *aus*. We used the same method of approximation of the aspectual profile as in EXP 4. The results shown in Figure 1c suggest that *an* is the most *ate(lic)* particle, *ab* the least *ate(lic)* one, while *ab* and *aus* are the most *te(lic)* ones. We then compared the annotator scores across tasks (divided into the two classes literal/non-literal), with additional splits into particles. The boxes in Figure 1b reflect the distribution. Most features show little correlation/differences with respect to (non-)literalness, but the distribution again suggests that *ab* has the most *te(lic)* profile (higher scores for *inXmin*, the inference of culmination and the adverbial of completion), while *an* has the most *ate(lic)* one (lowest scores for *inXmin* and adverbials of completion).

4 Conclusions

We propose that if particles are often required to express non-literal meaning (H1), it is because the particle's meaning represents an essential ingredient of the figure at play; e.g. in (1b), the inchoative meaning of *auf* is necessary for *steigen* to get its 'coming into appearance' sense; in (1a), it is the result phrase *off*, and not the base verb *cut*, that contributes the result entailment required for the non-literal target meaning *stop* (McNally & Spalek 2017). On the other hand, if non-literal senses make verbs aspectually less flexible (H2), it is –among other factors– because the unfolding of abstract events is less easy to track down than the unfolding of concrete events, for abstract events are assigned a poorer, more opaque, mereological structure; e.g. the non-literal sense of (2b) is not felicitous because it is odd to assign several stop-overs to the trajectory of X's anger in an abstract space. Finally, we propose that if H2 is less clearly supported in German than in French, it is perhaps because the aspectual shift triggered by non-literalness in French partly manifests itself in German through the loss of the particle's optionality. In this view, H1 and H3 represent two faces of the same coin.

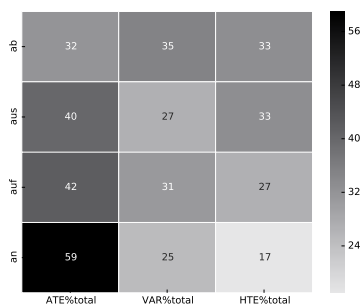
	stat X1 <i>be French</i>	stat-act X2 <i>sit</i>	act X3 <i>play</i>	var X4 <i>widen</i>	weak-acc X5 <i>eat an apple</i>	strong-acc X6 <i>close the door</i>	quasi-ach X7 <i>kill the cat</i>	ach X8 <i>find the key</i>
1. standard prog.	0	5	5	5	5	5	5	0-5
2. <i>for</i> -adv. (any reading)	5	5	5	5	2-5	0-3	0	0-5
3. partitive <i>for</i> -adv.	0	0	0	0	2-5	0-3	0	0
4. <i>in</i> -adv.	0	0	0	5	5	5	5	0-5
5. <i>completely P</i>	0-5	0	0	0-5	5	0-5	0	0
6. <i>P, but not compl.</i>	0-5	0	0	2-5	0-5	0-5	0	0
7. aspectual vbs	0	5	5	5	5	3-5	0	0

Table 1: Aspectual subclasses with most probable values w.r.t. some standard aspectual tests

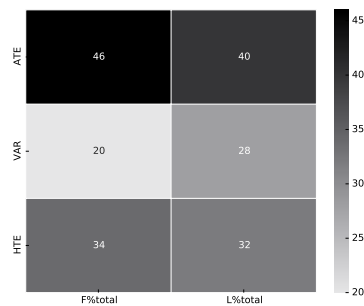


(a) Literal vs. non-literal senses across 8 aspectual classes.

(b) Annotator scores across tasks; split by particle.



(c) Aspectual classes across German PVs; by particle type.



(d) Literal vs. non-literal verb senses for French.

Figure 1: Aspect and (non-)literal verb senses in French and German.