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STRATEGIC MEANING CONSTRUAL OF ENGLISH PARTICLE VERBS IN CROATIAN AND ARABIC L2 SPEAKERS

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*This paper investigates the strategic meaning construal of English particle verb (PV) constructions in second language (L2) speakers of English whose first languages (L1s) are Croatian and Arabic. Drawing on a well-established research programme on strategic construal (Geld 2006, 2009; Geld & Letica Krevelj 2011; Geld & Maldonado 2011; Geld & Stanojević 2016), the present study replicates and extends prior findings to two typologically distinct L1 groups: Croatian, described as broadly satellite-framed, and Arabic, a verb-framed language. The instrument, coding scheme, and analytical framework are adapted from Geld (2009). Results show that while both groups employ topological, lexical, and compositional construal strategies, the frequency of topological construal is significantly lower among Arabic speakers ($t(44) = 4.49$, $p < .001$, $d = 1.32$). Differences in particle informativeness (*out and down > in and up*) and the semantic weight of verbs (light vs. heavy; $F(1, 45) = 118.84$, $p < .001$, $\eta^2 = .72$) also play significant roles. Findings confirm earlier claims that L2 meaning construal reflects both typological influence and general cognitive processes underlying language comprehension.*

Keywords: *English particle verbs; strategic meaning construal; cognitive linguistics; second language acquisition; Croatian; Arabic*

1. Introduction

Research on second language (L2) meaning construction has increasingly drawn on cognitive linguistic frameworks to explain how adult learners interpret semantically complex constructions such as English particle verbs (PVs). Unlike single-word lexical items, PVs present a dual-component structure in which both the verb and the particle carry semantic weight. Their meanings range from near-compositional to highly idiomatic, making them a productive site for examining how L2 speakers allocate attention across linguistic form and meaning during the process of construal (Langacker 1987, 2000).

A sustained research programme initiated by Geld (2006, 2009) and extended in a series of subsequent studies (Geld & Letica Krevelj 2011; Geld & Maldonado 2011; Geld & Stanojević 2016) has established that L2 speakers do not process PV meanings arbitrarily. Systematic and predictable patterns emerge, correlating with language-internal features of the construction (the semantic weight of the verb and the informativeness of the particle) and with language-external features, including the typological background of the learner's L1. Three strategy types have been identified: *topological determination* (reliance on the particle's spatial or image-schematic meaning), *lexical determination* (reliance on the verb's lexical content), and *compositional determination* (integration of both components). These categories, their operational definitions, and the instrument used to elicit them all originate in Geld (2009) and have been validated across multiple participant groups.

The present study addresses a gap in this programme: no prior study has directly compared Croatian and Arabic learners on a PV construal task spanning all four particles studied to date (*in, out, up, down*). Earlier studies compared Croatian speakers with Spanish speakers, whose L1 is verb-framed (Geld & Letica Krevelj 2011; Geld & Maldonado 2011), or compared learners sharing the same L1 (Croatian) but differing in embodied experience, namely sighted vs. blind speakers (Geld & Stanojević 2016). The Croatian-Arabic comparison is theoretically motivated by Talmy's (2000) typological distinction between satellite-framed and verb-framed languages: whereas Croatian uses verbal prefixes to encode spatial and aspectual relations alongside the verb, Arabic encodes comparable meanings within the verb root, with no separate satellite element. It should be noted, however, that Croatian is not a prototypical satellite-framed language in the way English is, it actually exhibits both satellital and lexical strategies in

expressing the core schema (Geld & Letica Krevelj 2011: 151), and is therefore better treated as occupying an intermediate position within Talmy's typology. This contrast is nonetheless predicted to influence how much attention learners direct toward the particle as a meaning-bearing unit. As discussed in Section 3.5, this prediction requires careful qualification when applied to Croatian specifically and to metaphorical PV meanings generally.

The paper is organised as follows. Section 2 reviews prior research in the programme and identifies the gap the present study addresses. Section 3 presents the theoretical framework. Section 4 describes the study design. Section 5 reports results. Section 6 discusses implications, limitations, and directions for future research. Section 7 concludes.

2. Background and Research Gap

Strategic meaning construal as a research concept was introduced in Geld (2006) and developed fully in Geld (2009), which constitutes the methodological and theoretical foundation of the present study. The original instrument comprised 45 tasks built around 20 PVs combining three light verbs (*go, take, put*) and seven heavy verbs (*call, cut, break, draw, pull, shut, write*) with the particles *in* and *out*. All meanings were collected from three learners' phrasal verb dictionaries and subjected to a triangulation test: they were rated for figurativeness by two linguists, five native speakers, and 40 proficient English majors on a 1-to-5 scale (1 = most literal, 5 = most metaphoric/abstract). Only the 45 meanings rated as highly metaphoric were retained for the instrument (Geld 2009: 85–86). This validation procedure is a defining methodological feature of the research programme and is adopted, in modified form, in the present study.

The initial participant sample consisted of 100 English majors: 68 from the University of Zagreb (Croatia) and 32 from UNAM (Mexico). A proficiency test was administered prior to the main study; the average scores were 73.68% for Croats and 68.63% for Mexicans, a difference that was not statistically significant (Geld 2009: 101). Geld (2009) established three core findings, further discussed in Geld & Maldonado (2011) from the same dataset:

> Topological determination is the dominant strategy with light-verb PVs; lexical determination is dominant with heavy-verb PVs (Geld 2009: 93–99).

> The particle *out* is more informative than *in* across both groups: learners find it easier to ground the composite meaning of PVs with *out* in the particle's spatial schema (Geld 2009: 103–104; Geld & Maldonado 2011).
>
> L1 typology influences strategy use: Croatian speakers show significantly higher rates of topological and compositional determination than Mexican Spanish speakers (Geld 2009: 105–111; Geld & Maldonado 2011).

Geld & Letica Krevelj (2011) extended the programme to *up* in PVs, using a new and previously unpublished dataset of 100 Croatian and Mexican English majors. The study confirmed the light/heavy verb effect and showed that Croatian speakers were more likely than Mexicans to engage in topological and compositional construal, an effect attributed to the satellite-framed tendencies of Croatian. Crucially, however, the authors also pointed out that Croatian is not a prototypical satellite-framed language, as it exhibits both lexical and satellital strategies in expressing the core schema (Geld & Letica Krevelj 2011: 151). This important qualification is taken up and developed further in Section 3.5, is retained and expanded in the present paper.

Geld & Stanojević (2016) extended the programme to *up* and *down* in a comparison of blind and sighted Croatian L2 speakers of English. That study confirmed that *down* is more informative than *up* across both groups, a finding attributed to *down* being closer to human scale and therefore less open to divergent metaphorical extension. It also confirmed that the light/heavy verb distinction is robust across different experiential groups. The asymmetry between *up* and *down* in informativeness mirrors the asymmetry previously established between *out* and *in*, and is consistent with research on dimensional antonym asymmetries (Tribushinina 2008, 2011).

The present study brings together all four particles (*in, out, up, down*) and introduces a typologically new contrast by including Arabic speakers alongside Croatian speakers. No prior study in the programme has examined Arabic learners, and the Croatian-Arabic comparison constitutes the specific research gap this study addresses. It is worth noting that research on typological influence in L2 has focused predominantly on motion event expression in general (Montero-Melis et al. 2017; Lewandowski & Özçalışkan

2021), while the role of L1 typology in PV meaning construal specifically has been addressed almost exclusively within the research programme initiated by Geld (2009). The present study therefore contributes to a relatively underexplored intersection of typological transfer research and constructional meaning construal in L2.

3. Theoretical Framework

3.1. Cognitive Linguistics and Construal

The theoretical grounding of this study lies within the framework of Cognitive Linguistics (Langacker 1987, 2000, 2008; Lakoff 1987; Johnson 1987; Talmy 2000), which views language as an integral part of general cognition. Grammar, semantics, and conceptualisation are held to be inseparable, and linguistic meaning is seen as dynamic, context-dependent, and motivated by general cognitive processes such as categorisation, attention, and perspective-taking.

Central to this framework is Langacker's notion of *construal*: the capacity to conceptualise and describe the same situation in multiple ways (Langacker 1987). Construal encompasses how speakers select, foreground, and configure aspects of a referent scene. For present purposes, the most relevant dimension is how L2 speakers distribute attention across the components of a composite structure such as a PV, specifically, how much semantic weight they assign to the verb versus the particle in constructing the meaning of the whole.

3.2. Analyzability, Compositionality, and the Scaffolding Metaphor

Langacker (2000) distinguishes between *analyzability* and *compositionality*. Analyzability refers to the degree to which the components of an expression remain cognitively active, that is, how easily a speaker can discern the contribution of each part. For example, in *break out* ('escape'), a speaker may still access the meanings of *break* (forceful disruption) and *out* (egress from a bounded region), even though the composite meaning has become conventionalised. Compositionality, on the other hand, refers to the predictability of the composite meaning from its parts. A highly analyzable expression is not necessarily fully compositional: emergent meaning may exceed what the parts alone predict (Langacker 2000: 94).

Geld (2009) treats analyzability and compositionality as strategic and gradient dimensions of meaning construction in L2. Learners approach PVs with varying distributions of attention across the verb and the particle: some foreground the particle's spatial meaning (topological construal), others foreground the verb's lexical meaning (lexical construal), and still others integrate both components jointly (compositional construal). In Langacker's (2000: 152) terms, learners use the component structures as "scaffolding" to reach the composite structure: sometimes via the verb, sometimes via the particle, and sometimes via both. The model in Figure 1 represents the composite structure and the factors affecting its construal in L2, as developed across the research programme (Geld 2009; Geld & Letica Krevelj 2011). At its centre is the formula ([A]+[B])C, representing the PV construction with its two component structures. The factors shaping construal are: the degree of schematicity of the verb (light vs. heavy), the degree of informativeness of the particle, the learner's L1 typological background, language proficiency, and broader experience of the world. The resulting continuum of semantic determination is represented in Figure 2.

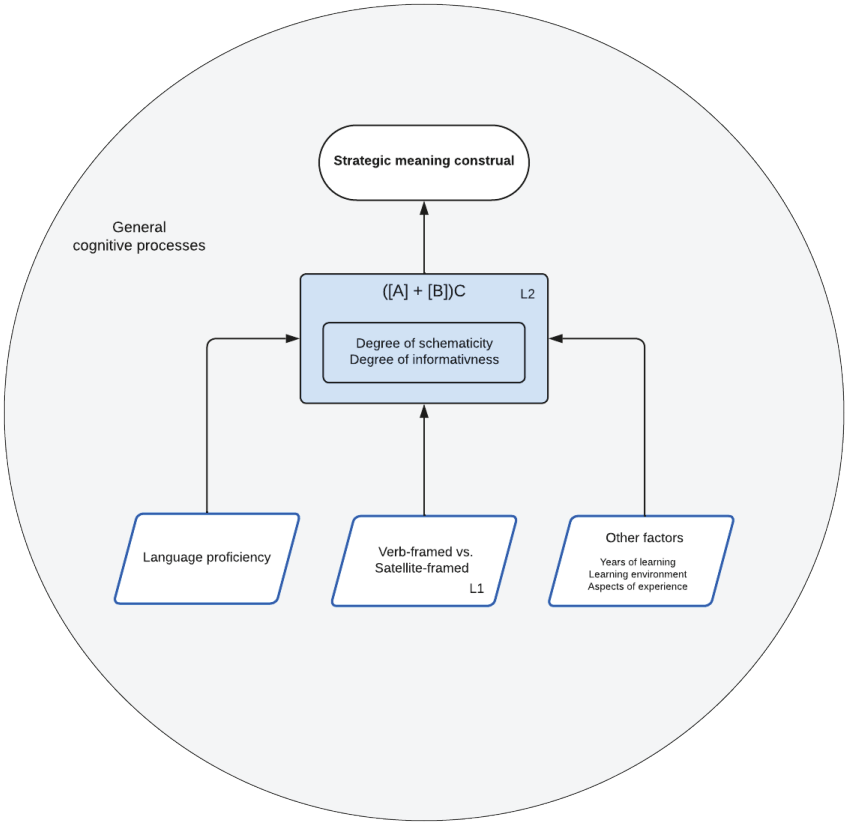


Figure 1. *Factors affecting the strategic construal of particles in PV constructions (adapted from Geld & Letica Krevelj 2011: 164)*

lexical determ. ← partial and gradient compositionality → topological determ.

Figure 2. *Semantic determination in the strategic construal of particle verbs (adapted from Geld 2009)*

The term *strategic compositionality*, used in this research programme since Geld (2006, 2009), is not a term Langacker uses. It was introduced to capture the deliberate, analytically motivated attention to both components that characterises compositional responses in this task context. It

does not claim that learners follow an explicit meta-linguistic procedure during real-time processing. Rather, the term reflects the analytical stance elicited by the research instrument, in which participants are asked to account for how a construction's meaning relates to its parts (see Section 4.3 on task design).

3.3. Light and Heavy Verbs

The distinction between light and heavy verbs is central to the study's predictions. *Light verbs* (here: *go, put, take*) are semantically schematic, high-frequency, and open to grammaticalised and idiomatic uses. They are semantically underspecified and tend to yield to the semantic content of the particle, which becomes the conceptually dominant element of the composite structure (Geld 2009: 95). *Heavy verbs* (here: *cut, break, pull*) carry specific, salient lexical content and impose stronger semantic constraints on the composite meaning, making lexical determination the more likely outcome. This definition follows Geld & Stanojević (2016: 2, fn. 2): light verbs are those "highly schematic in meaning, high-frequency, and particularly open to grammaticalized and idiomatic uses," contrasted with heavy verbs, which "have a more transparent and specific meaning." The distinction is gradient rather than categorical.

3.4. Particle Informativeness and Topological Grounding

The four particles investigated, *in, out, up*, and *down*, differ in their degree of *informativeness*: the extent to which they provide recoverable, salient cues to the meaning of the composite structure. This variation reflects how closely a particle's image-schematic base remains accessible in its metaphorically extended uses. In the cognitive linguistic framework adopted here, topology refers to the spatial configurational relations, such as containment, path, and boundary, that are grounded in embodied experience and underlie both the literal and metaphorically extended meanings of particles (Langacker 1987; Johnson 1987; Talmy 2000). It is in this sense that the term topological determination is used throughout this research programme (Geld 2006, 2009): to refer to all cases where the particle's spatial or image-schematic meaning overrides the verb in the construal of the composite whole.

Goossens (1990) introduced the term metaphtonymy to describe the interaction of metaphor and metonymy in meaning formation, and Brdar

and Brdar-Szabó (2009) have examined this interaction specifically in the context of particle verbs. In the case of particles, the relationship between image-schematic and metaphorical meaning is especially visible. *Out*, for instance, has a spatial base grounded in the image schema of egress from a bounded region. This base remains partially recoverable even in highly abstract extensions: in *cut out* 'stop doing something', for example, the OUT schema maps onto disengagement from an activity conceptualised as a bounded domain: the topological structure is preserved even as the domain shifts from physical space to abstract activity-space. This gradient from spatial to abstract meaning is consistent with the view that metaphor and metonymy operate on a continuum rather than as categorically distinct processes (Riemer 2002), and helps explain why *out* tends to be more informative than *in* as a construal cue: its spatial base remains more accessible across its extensions. *In*, by contrast, refers to a default, conceptually unmarked state: being inside the conceptualiser's own space (Langacker 2000; Dewell 2005; Johnson 1987). Containment is cognitively unmarked and thus less available as a distinctive interpretive cue (Geld 2009: 103–104; Geld & Maldonado 2011: 100). This predicts the *out* > *in* informativeness asymmetry established empirically in Geld (2009) and further reported in Geld & Maldonado (2011).

The analogous asymmetry between *down* and *up* is explained by Geld & Stanojević (2016) in terms of human scale and metaphorical range. *Down* tends to be at human scale, grounded in the immediate experience of gravity and bodily orientation, which constrains its metaphorical extension and keeps the topological base salient. *Up* is more schematic and open-ended, allowing a wider and more heterogeneous range of metaphorical extensions (as in *give up, break up, take up*), which reduces the predictive force of its basic spatial meaning. This is consistent with Tribushinina's (2008, 2011) work on dimensional antonyms, where the supra term (*up, deep*) tends to be more diversely metaphorised than the sub term (*down, shallow*). The predicted informativeness order is therefore: *down* ≈ *out* > *up* ≈ *in*.

3.5. Typological Background and L1 Transfer

Talmy's (2000) typology of motion-event encoding distinguishes *satellite-framed* languages, in which path information is characteristically expressed outside the verb (in a satellite, particle, or preposition), from *verb-framed* languages, in which path is typically incorporated within the verb root. English is a canonical satellite-framed language; Arabic is a ca-

nonical verb-framed language (belonging to the Semitic family); Croatian is more complex.

As Talmy (2000: 221–222) defines them, satellites include 'English verb particles, German separable and inseparable verb prefixes, Russian verb prefixes, Chinese verb complements,' among others. This is important because it shows that Talmy's satellite category is not restricted to free words, it also accommodates morphologically bound prefixes, as in Russian. Croatian verbal prefixes (e.g., *iz-, u-, uz-, za-*) have been cited as analogues of English particles (Geld & Letica Krevelj 2011; Geld & Maldonado 2011). For example, the Croatian prefix *u-* relates to meanings of entering and containment (as in *ući* 'go in', *uroniti* 'dive in'), and *iz-* relates to meanings of egress (as in *izaći* 'go out') (Geld 2009: 14). However, Croatian is not a prototypical satellite-framed language like English, as it also uses verb-only constructions to express path, exhibiting both lexical and satellital strategies in expressing the core schema (Geld & Letica Krevelj 2011: 151). Croatian is therefore better characterised as occupying an intermediate position within Talmy's typology.

The metaphorical nature of the PVs investigated deserves comment in relation to the typological argument. Talmy's typology was developed to account for literal motion constructions: canonical examples such as *He ran into the house* (English, satellite-framed) vs. *He entered the house running* (Spanish, verb-framed). Most of the PVs examined in the present study involve metaphorical extensions of spatial schemas rather than literal motion: *put down* 'criticise', *break up* 'end a relationship', *cut in* 'interrupt'. At first glance this might appear to weaken the typological argument. However, the present study does not investigate spontaneous motion event encoding, it investigates explicit meaning construal of idiomatic expressions. Participants were directly asked to account for how a given meaning relates to its component parts, and in doing so they recruited their knowledge of the motivatedness of spatial language and the continuum of meanings from concrete topology to abstract metaphorical extension. From this perspective, the relevant effect of L1 typology is not whether speakers encode literal motion in the same way, but whether their L1 primes them to attend to spatial morphemes as semantically meaningful units. A speaker whose L1 uses semantically motivated spatial prefixes is better equipped to recognise and exploit the topological base of English particles even in their most abstract extensions. The typological argument is therefore not undermined by the metaphorical nature of the PVs, though

it remains suggestive rather than deterministic, and alternative explanations including proficiency, instructional background, and lexical familiarity are discussed in Section 6.

It is also relevant that the structuring of spatial meaning varies across languages in ways that bear on the present comparison. Brdar & Brdar-Szabó (2009) have examined the metaphorical and metonymic nature of particle verb meanings, showing that the relationship between spatial base and abstract extension is not uniform across constructions. In Slavic languages such as Croatian, spatial and aspectual relations are frequently encoded through verbal prefixes functioning analogously to English particles in signalling path or result. Arabic, with its tri-literal root-and-pattern morphology (a system in which a root meaning is carried by three consonants and grammatical and derivational meanings are expressed through vowel patterns and affixes built around that root), encodes spatial and path meanings within the verb root itself, with no separate satellite element analogous to an English particle or a Croatian prefix. This structural asymmetry provides additional motivation for the prediction that Croatian and Arabic learners may attend differently to the particle component in English PVs.

4. The Study

4.1. Research Questions and Hypotheses

The present study addresses the following research questions:

RQ1: Do Croatian and Arabic learners of English employ the same types of construal strategies (topological, lexical, compositional) when interpreting English PVs, and does the relative frequency of topological construal differ between the two groups?

RQ2: Do the four particles (*in, out, up, down*) differ in their degree of informativeness, and is this effect modulated by learners' L1?

RQ3: Does the semantic weight of the verb (light vs. heavy) interact with construal strategy type across the full sample?

These questions yield the following hypotheses, adapted from the research programme:

> H1: Both groups will use topological, lexical, and compositional strategies (no significant L1 × strategy interaction). However, given the verb-framed nature of Arabic, Arabic speakers will show significantly lower rates of topological determination than Croatian speakers.
>
> H2: The particles will differ in their degree of informativeness. Based on prior findings, *out* and *down* are expected to be more informative than *in* and *up*. No specific L1 × particle interaction is predicted a priori, given within-particle heterogeneity of metaphorical extensions.
>
> H3: Across both groups, topological determination will be more frequent with light-verb PVs, and lexical determination will be more frequent with heavy-verb PVs. This hypothesis is stated across both groups because verb semantic weight is a language-internal variable expected to operate regardless of L1 background (Geld 2009; Geld & Letica Krevelj 2011).

4.2. Participants

The sample consisted of two groups: English majors from Sultan Qaboos University, Oman (N = 24, L1 Arabic) and English majors from the University of Zagreb, Croatia (N = 22, L1 Croatian). Both groups were advanced learners of English at a comparable stage of university-level English study (predominantly third and fourth year undergraduates). The groups were comparable in age (range approximately 20–26) and in years of formal English instruction.

All participants provided informed written consent. Participation was voluntary. Ethical approval for this study was obtained from the Ethical Committee of the SLA and TEFL Section, Department of English, Faculty of Humanities and Social Sciences, University of Zagreb (February 2019). Confidentiality of participants was maintained throughout.

An important methodological limitation is that the groups were not matched on standardised proficiency measures. Prior studies in this research programme administered a proficiency test before the main study to

confirm group comparability (Geld 2009: 101; Geld & Stanojević 2016); the present study does not include such a test. While both groups were at comparable stages of English-medium academic education, differences in English proficiency, instructional exposure to phrasal verbs, and educational context cannot be excluded as contributing factors to observed group differences. This limitation is discussed in Section 6.

4.3. Instrument and Procedure

The instrument was a paper-based questionnaire comprising 24 PV items adapted from Geld (2009). The instrument was reduced and modified from the original 45-item questionnaire by selecting items covering all four particles (*in, out, up, down*) and retaining the light/heavy verb contrast. All 24 PV meanings had been validated as highly metaphoric in the original triangulation procedure (Geld 2009: 85–86), in which meanings were rated by two linguists, five native speakers, and 40 proficient English majors. The final selection of 24 items is presented in Table 1.

Each item presented a PV followed by its idiomatic meaning in parentheses (e.g., *go up* 'be destroyed by fire or explosion'). Participants were asked to explain what it is in the construction that produces the given meaning. Instructions were provided in English. There were no time constraints. Participants worked individually in a classroom setting without consulting dictionaries or other sources. An example item ran as follows: *cut in* (interrupt somebody's conversation). 'Explain what it is in this expression that produces its meaning.'

Participants were presented with the PV and its definition simultaneously, so their task was not to guess the meaning but to account for how a given meaning relates to the construction's parts. This is an offline, metalinguistic task, and the responses accordingly reflect explicit conceptual justifications rather than real-time comprehension processes. The distinction between offline metalinguistic explanation and online language processing is well-established in SLA research: explicit knowledge and metalinguistic awareness operate differently from the implicit, automatised knowledge recruited during spontaneous language use (Schmidt 1990; Ellis 2004; DeKeyser 2003; Bialystok 1994). The coding categories therefore capture patterns in participants' explicit reasoning, which may or may not correspond to the implicit cognitive operations they employ during spontaneous language use. This issue is discussed further in Sections 4.4 and 6.5.

Table 1. *Particle verb items, target meanings, and verb type*

Particle Verb	Target Meaning	Verb Type
go up	be destroyed by fire or explosion	Light
go down	be sent to prison	Light
go in	become hidden	Light
go out	stop burning	Light
put up	resist strongly or fight hard	Light
put down	criticise somebody and make them feel stupid	Light
put in	interrupt	Light
put out	injure your back, shoulder, hip, etc.	Light
take up	fill an amount of space or time	Light
take down	write something	Light
take in	understand or absorb something	Light
take out	go out socially with somebody	Light
cut up	suddenly drive in front of another vehicle dangerously	Heavy
cut down	kill somebody	Heavy
cut in	interrupt somebody's conversation	Heavy
cut out	stop doing something	Heavy
pull up	stop while driving, especially for a short period	Heavy
pull down	destroy a building	Heavy
pull in	move to the side of the road to stop	Heavy
pull out	stop being involved in something	Heavy
break up	end a relationship	Heavy
break down	stop working	Heavy
break in	wear something until it is comfortable	Heavy
break out	escape	Heavy

4.4. Coding

The coding scheme was developed in Geld (2009: 88–92) and has been applied consistently across all studies in the research programme. Each response was assigned one of eight codes. The data was first copied, grouped and sequenced, and then subjected to several close readings before final coding decisions were made, a procedure that mirrors the original study (Geld 2009: 88).

Table 2. *Coding categories with definitions and illustrative examples*

Code	Label	Definition	Example
TOP	Topological determination	Particle's spatial/ image-schematic meaning overrides the lexical component; the particle's meaning is the primary basis for explaining the PV meaning.	*Take out* = 'kill': 'like placing the person outside this world'
LEX	Lexical determination	Verb's lexical meaning overrides the particle; the verb's content is the primary basis for the explanation.	*Cut in* ='interrupt': 'you cut the flow of conversation like cutting a rope'
CMP	Compositional	Both the verb and the particle are integrated in the explanation.	*Go up* = 'be destroyed': 'go = something is happening, up = it all ends up in the air'
PPH	Paraphrase	Response restates the given definition without analysing the PV's component contributions.	go out = 'stop burning': 'it means to stop burning'
OPP	Opposition	Response identifies the PV by contrast with its directional opposite.	go in = 'become hidden': 'the opposite of go out'

Code	Label	Definition	Example
MIS	Misinterpretation	Response bears no discernible relation to the given meaning.	put down = 'criticise somebody': 'you put something on the ground'
CTX	Contextual explanation	Response invokes a situational context without analysing the verb or particle.	break out = 'escape': 'when someone is in prison and manages to get away'
LXD	Lexicalised equivalent	A Latinate or single-word equivalent is offered as an explanation, without further analysis.	take in = 'understand or absorb something': 'comprehend'

The first three categories (TOP, LEX, CMP) capture construal strategies and are the primary focus of the hypotheses. The remaining five categories (PPH, OPP, MIS, CTX, LXD) reflect other response types that emerged from the data: they describe avoidance, metalinguistic substitution, or misinterpretation. The LXD category in particular records lexical substitution behaviour that may reflect instructional background rather than active meaning-making. These categories are retained because they account for the full range of participant responses and provide a complete picture of the data.

All 1,104 responses (46 participants × 24 items) were coded independently by two trained raters following the coding procedure established in Geld (2009). Inter-rater agreement was computed using Cohen's kappa. Initial agreement was $\kappa = .82$, indicating strong reliability (Landis & Koch 1977). All disagreements were resolved through discussion. For the statistical analyses, the three primary strategy categories (TOP, LEX, CMP) were used as count variables per participant across the 24 items.

4.5. Statistical Analysis

Statistical analyses were conducted in JASP (Version 0.16). For H1, a mixed-measures ANOVA was conducted with L1 (Croatian vs. Arabic) as a between-subjects factor and strategy type (TOP, LEX, CMP) as a within-subjects factor, testing the L1 × strategy interaction. A follow-up independent-samples t-test compared the two groups on topological determination specifically, as predicted by H1. For H2, a one-way repeated-measures ANOVA examined mean topological construal by particle type (*in, out, up, down*), with an additional L1 × particle interaction test. For H3, a two-way repeated-measures ANOVA examined the interaction of verb type (light vs. heavy) and strategy type (TOP vs. LEX). Eta-squared (η^2) is reported as a measure of effect size. Cohen's d is reported for the key between-groups comparison. Assumptions of normality were checked using Shapiro-Wilk tests; homogeneity of variance was assessed using Levene's test.

5. Results

5.1. Strategy Use by L1 Group (H1)

The mixed-measures ANOVA revealed no significant L1 × strategy interaction ($F(2, 88) = 2.01$, $p = .14$, $\eta^2 = .04$). Both groups employed all three strategy types, confirming the first part of H1: the overall qualitative distribution of strategies does not differ between groups. Table 3 presents descriptive statistics, and Figure 3 illustrates the interaction pattern.

Table 3. *Strategy type counts by L1 group (mean per participant, SD)*

Strategy	L1	Mean (per participant)	SD	N
Topological	Croatian	5.50	2.79	22
Topological	Arabic	2.38	1.88	24
Lexical	Croatian	5.41	3.17	22
Lexical	Arabic	5.50	3.64	24
Compositional	Croatian	6.77	4.82	22
Compositional	Arabic	7.42	7.25	24

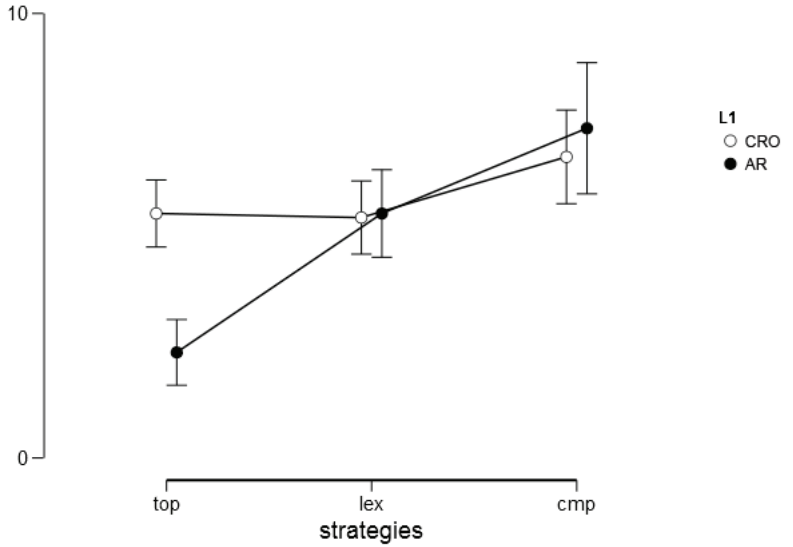


Figure 3. *Strategy type by L1 group*

As predicted, however, Arabic speakers relied significantly less on topological determination: $t(44) = 4.49$, $p < .001$, $d = 1.32$ (large effect size). This confirms the second part of H1. Lexical and compositional strategy rates were comparable between the two groups, with no significant between-group differences on either dimension.

5.2. Particle Informativeness (H2)

A one-way repeated-measures ANOVA on topological construal by particle type revealed a significant main effect of particle ($F(2, 88) = 14.16$, $p < .001$, $\eta^2 = .24$). Collapsed across both groups, *out* and *down* were more informative than *in* and *up*, consistent with the predicted hierarchy. Table 4 presents descriptive statistics, and Figure 4 illustrates the particle hierarchy across both groups.

Table 4. *Mean topological construal by particle and L1 group*

Particle	L1	Mean	SD	N
out	Croatian	3.55	1.47	22
out	Arabic	2.54	1.82	24
up	Croatian	2.23	1.31	22
up	Arabic	2.04	1.92	24
down	Croatian	3.77	1.54	22
down	Arabic	3.08	1.82	24
in	Croatian	2.73	1.75	22
in	Arabic	2.13	1.65	24

No significant L1 × particle interaction was found ($F(2, 88) = 1.21$, $p = .30$, $\eta^2 = .03$), indicating that the particle informativeness hierarchy held similarly across both L1 groups. H2 is therefore confirmed for the main effect but not for the L1 interaction component, consistent with the prediction stated in Section 4.1.

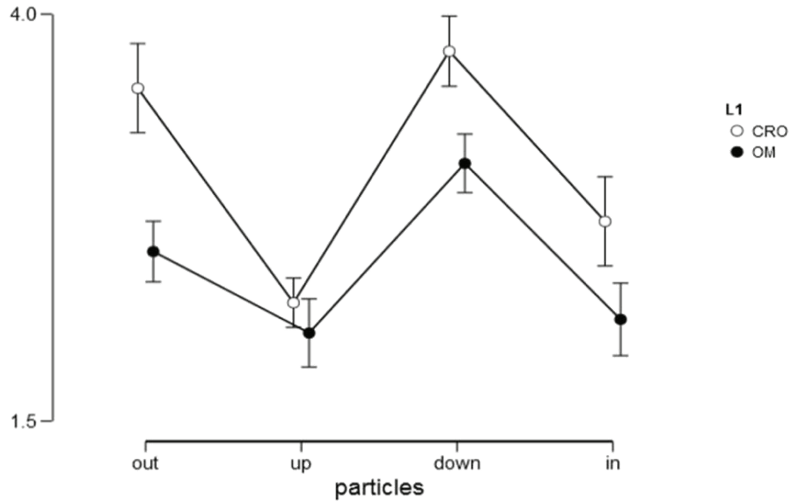


Figure 4. *Topological construal by particle type and L1 group*

5.3. Verb Type and Strategy (H3)

A two-way repeated-measures ANOVA with verb type (light vs. heavy) and strategy type (TOP vs. LEX) as within-subjects factors revealed a significant interaction ($F(1, 45) = 118.84$, $p < .001$, $\eta^2 = .72$). As shown in Table 5 and Figure 5, topological determination was considerably more frequent with light-verb PVs, while lexical determination dominated with heavy-verb PVs. H3 is confirmed with a very large effect size.

Table 5. *Topological vs. lexical determination by verb type (pooled across groups)*

Verb Type	Strategy	Mean (per participant)	SD	N
Heavy	Topological	0.72	1.05	46
Heavy	Lexical	4.17	2.73	46
Light	Topological	3.15	2.12	46
Light	Lexical	1.28	1.05	46

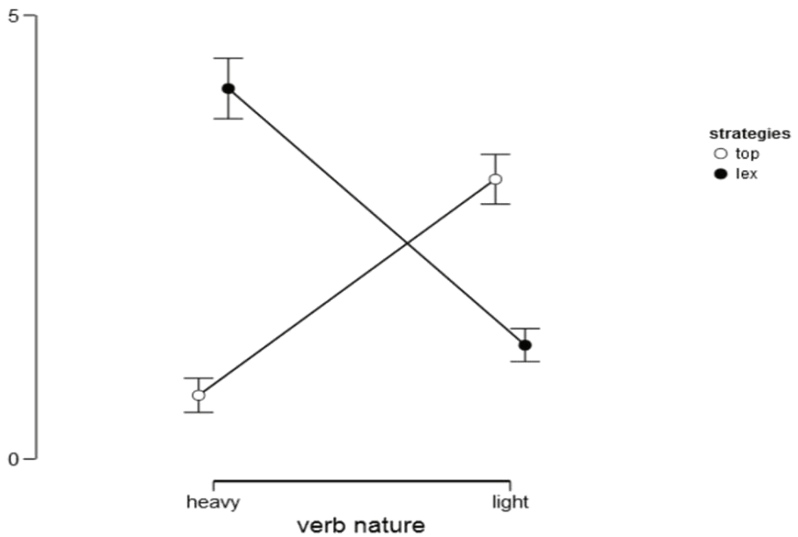


Figure 5. *Topological vs. lexical determination by verb type*

Compositional strategies showed a more even distribution across verb types and are not the focus of H3. The present result replicates the core finding established in Geld (2009) and further reported in Geld & Maldonado (2011), confirmed in Geld & Letica Krevelj (2011) with previously unanalysed items from the same dataset, and independently replicated in Geld & Stanojević (2016) with a different participant group: light verbs systematically favour topological determination, while heavy verbs systematically favour lexical determination.

6. Discussion

6.1. Typological Transfer and Alternative Explanations

The most robust finding in this study is the significantly lower rate of topological determination in the Arabic group (H1 confirmed, d = 1.32). This result extends the L1 effect established in Geld (2009), further reported in Geld & Maldonado (2011), and confirmed in Geld & Letica Krevelj (2011), in which Croatian speakers consistently showed higher rates of topological and compositional construal than Mexican Spanish speakers. The present study extends that line of evidence to a new typological contrast: Arabic, a Semitic verb-framed language, shows even lower topological determination than would be expected on the basis of the prior literature on Croatian-Spanish comparisons.

From the perspective of MacWhinney's (2001, 2006) competition model, L1-established patterns of form-meaning mapping function as competing cues in L2 processing. For speakers whose L1 encodes spatial and aspectual information within the verb root (Arabic), directing attention to a separate particle as the primary meaning-bearing element runs counter to entrenched cognitive habits. For speakers whose L1 uses bound morphemes encoding path and spatial relations alongside the verb (Croatian), attending to the particle's spatial meaning represents a positively transferring cognitive strategy.

However, this typological interpretation must be held against several alternative explanations that the present study cannot rule out. The most substantiated alternative concerns language proficiency: higher proficiency has been shown to promote particle-attending strategies, with Geld (2009: 100–104) finding significant positive correlations between proficiency and topological determination for light-verb PVs with *in*, and between profi-

ciency and compositionality across verb types. If Croatian and Arabic participants differed systematically in proficiency, this alone could account for part of the observed group difference. Other alternative explanations are possible but cannot be assessed on the basis of the present data: it is conceivable that differences in instructional context, such as varying degrees of emphasis on phrasal verbs in English language teaching across the two educational settings, or differences in cumulative exposure to English PVs outside formal education may have contributed to the observed pattern. Because the study does not control for these variables, the typological interpretation remains suggestive rather than conclusive.

The qualification of Croatian's typological status (Section 3.5) further nuances the interpretation. Croatian speakers may benefit from experience with bound spatial morphemes that transfer positively to the recognition of English particles' semantic contribution. Croatian morphological structure orients speakers to attend to spatial-aspectual form-meaning pairings that are expressed separately from the verb root.

6.2. Particle Informativeness

The particle hierarchy, *out* ≈ *down* > *up* ≈ *in*, was confirmed (H2, main effect). This replicates the *out* > *in* asymmetry established in Geld (2009) and further reported in Geld & Maldonado (2011), and the *down* > *up* asymmetry established in Geld & Stanojević (2016). The non-significant L1 × particle interaction indicates that the informativeness hierarchy is not substantially modulated by L1 background: both Croatian and Arabic learners found *out* and *down* more informative than *in* and *up*, regardless of their L1.

The theoretical explanation for these asymmetries, as developed in prior work, rests on the experiential grounding of the particles' image schemas. The *in* schema corresponds to containment, the conceptualiser's own default space, which is cognitively unmarked and therefore less salient as a distinctive cue (Langacker 2000; Dewell 2005). The *out* schema profiles egress from a bounded region, which is marked and contrastive. Similarly, *down* is constrained by human scale and gravity, keeping its topological base more accessible across its metaphorical extensions; *up* is more open-ended and schematic, allowing more diverse metaphorical networks in which the basic spatial meaning recedes (Geld & Stanojević 2016; Tribushinina 2008, 2011).

An important caveat is that the particle-level analysis pools responses across PVs with heterogeneous degrees of metaphorical extension. Within the *down* category, for instance, *go down* 'be sent to prison' retains a close connection to the DOWN schema (social hierarchy, moral valuation), while *break down* 'stop working' involves a more abstract extension. This within-particle heterogeneity limits the precision of particle-level comparisons and likely contributes to the non-significant L1 × particle interaction. Future item-level analyses would offer a more fine-grained picture.

6.3. Verb Semantic Weight

The strongest statistical effect observed was the verb type × strategy type interaction (H3, $\eta^2 = .72$). Light-verb PVs strongly favoured topological determination; heavy-verb PVs strongly favoured lexical determination. This is the most robust, most replicable finding in the entire research programme, established in Geld (2009) and further reported in Geld & Maldonado (2011) from the same dataset, confirmed in Geld & Letica Krevelj (2011) with previously unanalysed items from the same dataset, and independently replicated in Geld & Stanojević (2016) with a different participant group.

The theoretical explanation is straightforward within Langacker's framework: light verbs, being semantically underspecified, yield to the semantic prominence of the particle, which functions as the primary conceptual anchor for the composite structure (Geld 2009: 95). Heavy verbs, with their specific lexical content, impose stronger constraints on the composite meaning and override the particle's contribution. In Langacker's (2000: 152) terms, the components serve as different types of "scaffolding" for reaching the composite structure: sometimes the particle does the lifting, sometimes the verb.

Given its large effect size and cross-linguistic robustness, the verb type effect arguably deserves greater theoretical attention than the L1 effect, which is smaller ($d = 1.32$ vs. $\eta^2 = .72$) and open to alternative interpretations. Pedagogically, this finding suggests that learners from any L1 background may benefit from explicit instruction that distinguishes light-verb PVs (where the particle is the primary semantic cue) from heavy-verb PVs (where the verb's meaning provides more leverage).

A note on compositionality is warranted here. The offline task design means that compositional responses demonstrate *awareness* of both com-

ponents' contributions, an aspect of analyzability in Langacker's sense, but cannot be taken as direct evidence of real-time conceptual integration. Speakers frequently reinterpret conventionalised expressions using accessible schemas even when the expression is stored as a holistic lexical unit (Langacker 1987). The coding categories therefore capture patterns in explicit reasoning, which may or may not correspond to the implicit cognitive operations employed during spontaneous language use.

6.4. Methodological Limitations

Methodological limitations include: (a) the relatively small sample size (N = 46 total), which reduces statistical power and restricts generalisability; (b) the absence of proficiency controls; (c) the absence of information on instructional background and exposure to PVs outside formal education. Future research should address these limitations through larger, proficiency-matched samples and instructional background assessments.

6.5. Theoretical and Pedagogical Implications

These findings carry both theoretical and pedagogical implications. Theoretically, they extend the cross-linguistic evidence supporting the cognitive linguistic claim that meaning construction in L2 is grounded in general cognitive mechanisms, including embodied image schemas, metaphorical extension, and attentional distribution, while also being shaped by language-specific experience. The replication of the light/heavy verb effect across Croatian and Arabic learners, two typologically distant groups, strengthens the claim that this is a robust, construction-level phenomenon.

The results also lend empirical support to Geld & Maldonado's (2011: 102–103) claim that L2 learners' construal of PVs traces paths resembling the grammaticalisation continuum documented for English particles in L1: from concrete processual topology, through static topology and abstract displacement, to aspectual meaning. The present data confirm that this path is not idiosyncratic to particular learner groups but emerges across typologically diverse backgrounds.

Pedagogically, the results suggest that learners from verb-framed L1 backgrounds may benefit from explicit instruction in the spatial and image-schematic meanings of English particles, and from awareness-raising activities that highlight the distinction between light-verb PVs (where the particle is the primary semantic cue) and heavy-verb PVs (where the verb

provides more leverage). This is consistent with Schmidt's (1990, 2001) noticing hypothesis and with pedagogical applications of cognitive linguistics discussed by Taylor (2008).

7. Conclusion

This study has investigated the strategic meaning construal of English particle verbs in Croatian and Arabic L2 speakers, replicating and extending a sustained research programme initiated in Geld (2006, 2009). The instrument, coding scheme, and analytical framework originate in that programme and have been adapted for the present participant comparison. Four main findings emerge:

> Both Croatian and Arabic speakers employed topological, lexical, and compositional construal strategies with no significant difference in the overall qualitative strategy distribution (H1, first part confirmed).
>
> Arabic speakers showed significantly lower rates of topological determination than Croatian speakers ($t(44) = 4.49$, $p < .001$, $d = 1.32$), consistent with the predicted influence of L1 typological background, though alternative explanations involving proficiency and instructional context cannot be excluded (H1, second part confirmed).
>
> The particles differed in informativeness: *out* and *down* elicited more topological construal than *in* and *up*, consistent with prior findings on experiential grounding and human scale. This hierarchy held across both L1 groups, with no significant L1 × particle interaction (H2 confirmed for main effect).
>
> The strongest effect in the study was the interaction of verb semantic weight and strategy type ($\eta^2 = .72$): light-verb PVs strongly favoured topological determination; heavy-verb PVs strongly favoured lexical determination. This replicates the core finding of the research programme across a new typological contrast (H3 confirmed).

These findings contribute cross-linguistic evidence that L2 meaning construal is grounded in general cognitive mechanisms while being shaped by language-specific experience. Future research should incorporate com-

plementary online measures, standardised proficiency controls, larger and typologically broader samples, and instructional background surveys to consolidate and extend these findings.

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SAŽETAK

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STRATEŠKO KONSTRUIRANJE ZNAČENJA ENGLESKIH FRAZNIH GLAGOLA KOD GOVORNIKA HRVATSKOG I ARAPSKOG KAO PRVOG JEZIKA

U radu se istražuje strateško konstruiranje značenja engleskih fraznih glagola kod govornika engleskog kao drugog jezika (J2) čiji su prvi jezici (J1) hrvatski i arapski. Oslanjajući se na razvijeni istraživački program strateškog konstruiranja značenja (Geld 2006, 2009; Geld i Letica Krevelj 2011; Geld i Maldonado 2011; Geld i Stanojević 2016), istraživanje replicira dosadašnje nalaze proširujući ih uvođenjem arapskog kao novog J1 u istraživački program. Instrument, postupak kodiranja i analitički okvir preuzeti su iz Geld (2009). Rezultati pokazuju da obje skupine primjenjuju topološko određenje, leksičko određenje i kompozicionalnost, no učestalost topološkog određenja značajno je niža kod govornika arapskog ($t(44) = 4{,}49$, $p < {,}001$, $d = 1{,}32$). Razlike u informativnosti čestica (*out* i *down* > *in* i *up*) te shematičnost leksičke sastavnice fraznog glagola ($F(1, 45) = 118{,}84$, $p < {,}001$, $\eta^2 = {,}72$) također igraju značajnu ulogu. Nalazi potvrđuju ranije tvrdnje da konstruiranje značenja u J2 odražava tipološki prijenos i opće kognitivne procese koji su u osnovi razumijevanja jezika.

Ključne riječi: *engleski frazni glagoli; strateško konstruiranje značenja; kognitivna lingvistika; usvajanje drugog jezika; hrvatski; arapski*