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Verb class, case, and order.
A cross-linguistic experiment on non-nominative experiencers

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Abstract

In several languages, non-nominative experiencers tend to appear early on in utterances, which frequently triggers deviations from the preferred word order. These observations are based on linearization preferences, which in most cases involve gradient levels that cannot be determined precisely through singular intuitions. This article presents a cross-linguistic experimental study on languages with different word order properties (German, Greek, Hungarian, and Korean), offering precise estimates for the effects of experiencer objects on linearization. The findings reveal a strong effect of case in the sense that dative experiencers appear more frequently early in an utterance than accusative experiencers. Based on the specific properties of the investigated languages, we are revising previous hypotheses about the source of the dative/accusative asymmetry and conclude that the asymmetry relates to phrase-structural differences. Accusative experiencers are fronted more frequently than patients of canonical transitive verbs. We argue that this phenomenon relates to a preference for selecting experiencers as aboutness topics, which explains the fact that *experiencer-first* structures appear in syntactic constructions that may be triggered by aboutness. The results show that the experiencer-first principle interacts with properties of the syntactic structure. The differences between languages can thus be traced back to the basic properties of syntactic typology.

Keywords

experiencer, psych-effect, word order, contextual licensing, dative causer, forced choice

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1. Introduction

A central issue in the research on argument structure is the status of particular classes of verbs whose thematic properties deviate from the default transitive configuration involving an agent subject and a patient object. Psychological verbs, as for instance *x concerns y*, *x annoys y*, play a prominent role in this field of research as they show structural properties that deviate from the patterns established for canonical verbs (Arad 1998; Belletti and Rizzi 1988; Pesetsky 1987; Postal 1971). These predicates license two theta roles: an experiencer, which refers to an animate individual affected by an internal (psychological) event, and a stimulus, which refers to an (animate or inanimate) individual which triggers this event or is this event's subject matter. Psych-verbs encoding the experiencer in a typical objective case (generally dative or accusative), henceforth called experiencer-object (EO) verbs, are of particular interest. For many languages, researchers have shown that the properties displayed by experiencer objects in relation to their behavior in several syntactic phenomena, e.g. nominalization, reflexivization, passivization, extraction, binding, and argument linearization, differ from those of canonical objects (also termed 'psych properties') (Belletti and Rizzi 1988; Pesetsky 1995; Bayer 2004; Fanselow 2000; Grewendorf 1989; Haspelmath 2001; Klein and Kutscher 2002; Landau 2010). These properties are sometimes recognized as evidence for the subject status of the experiencer. Putting the controversy about the subject/non-subject issue aside, the crucial question is whether these phenomena reflect a constituent structure in which the non-nominative constituent (experiencer) occupies a higher argument position than the nominative constituent (stimulus) (see further discussion in Section 2).

In languages with morphological case, EOs frequently appear with two case marking patterns: some verbs take accusative EOs (e.g., German x_{nom} *interessiert* y_{acc} 'x interests/concerns y') while others take dative EOs (e.g., German x_{nom} *gefällt* y_{dat} 'y likes x'). Interestingly, this difference in case marking correlates with differences concerning linearization properties. For instance, acceptability studies in German have shown that both orders, 'experiencer $\prec$ stimulus' and 'stimulus $\prec$ experiencer', are equally acceptable for accusative EO verbs while dative verbs show a preference for the 'experiencer $\prec$ stimulus' order (Haupt et al. 2008: 84, confirming earlier observations by Lenerz 1977; Hoberg 1981; Primus 2004; see also corpus findings in Bader and Häussler 2010: 727). The question is where the impact of case comes from. Do accusative and dative experiencers correspond to different types of clause structure or are there particular reasons that block accusative argument fronting (see Section 3 for further discussion)?

Intuitions about the well-formedness of alternative linearizations provide the main basis for generalizations about the word order of EO verbs. Since these phenomena are influenced by several factors (e.g., animacy, contextual licensors, etc.) and involve gradience (see, e.g., the observations of the difference between dative and accusative experiencers), singular intuitions cannot provide sufficient evidence for estimating the exact properties of the phenomenon at issue. The origin of judgments of the type 'the order *xy* is more/less acceptable than the order *yx*', on the other hand, is hard to trace back: are such statements based on the number of contexts that a given order occurs in, i.e. does a wider range of suitable contexts increase the acceptability, or is it the absolute frequency of a licensing context in discourse for a given order that determines its acceptability? The available data across languages are furthermore not reliable for cross-

linguistic comparisons since it is impossible to assess the extent to which the differences between languages are influenced by the bias of different observers. Therefore, we carried out a cross-linguistic experimental study, examining the effects of experiencer-fronting phenomena across languages. We use the data to compare two OV (German, Korean) and two VO languages (Greek, Hungarian), which display several differences in word order properties as well as in the properties of experiencer-object constructions. We examine the basic dimensions of the linearization properties of EO verbs with a parallel experimental design: (a) we compare experiencer arguments with other constituents that are syntactically similar in order to identify the particular properties of EO verbs; (b) we compare the role of accusative and dative experiencers; (c) we compare the effects of experiencer objects with the effects of the context on linearization (see details in Section 5). Our aim is to identify cross-linguistic differences and draw conclusions about their relation to grammatical properties that exist independently of experiencer objects, e.g., the word order properties of the languages at issue.

The results of this study show that the preference for the experiencer-first linearization is not identical across languages (Section 6). We claim that the essential properties of the cross-linguistic variation can be understood by examining the structural properties of word order for the individual languages (Section 7).

2. Experiencers and linearization

2.1. Phenomena and accounts

It has been observed for a number of languages that verbs with non-nominative experiencers may occur in a linearization where the experiencer appears early on in the clause without a contextual trigger. This exceptional behavior appears in particular with a subset of EO verbs, namely non-agentive EO verbs such as *concern* or *fascinate* in which the subject does not exercise control over the event (Arad 1998; Klein and Kutscher 2002; Reinhart 2002; Landau 2010; Scheepers 1997). The particular role of experiencers in linearization was first reported on the basis of intuition data (Lenerz 1977 for German; Belletti and Rizzi 1988 for Italian; Anagnostopoulou 1999 for Greek). Furthermore, production studies both with naturalistic and with experimental data, confirm a linearization asymmetry that depends on the theta-role of the object (Ferreira 1994 for English; Ichihashi-Nakayama 1994 for Nepali; Author 2014 for German). Linearization preferences are also reflected in speech comprehension (Scheepers 1997; Scheepers et al. 2000; Haupt et al. 2008 for German). The phenomenon at issue is summarized in (1).

(1) EXPERIENCERFIRST
An experiencer object is more likely than a patient object to occur early in the linearization.

The statement in (1) is an observational generalization. The challenge is to identify the structural operation that is reflected in this observation on linear order. The sources of the phenomenon in (1) should be found either in the discourse prominence of experiencers or in their position in hierarchical syntax.

Syntax-based accounts assume that the linearization properties of experiencers reflect their properties in a hierarchical syntactic structure. Different theta-roles are hosted by different structural projections, as schematically presented in (2). Following current

assumptions, the patient is an internal argument of the VP, while the agent is hosted by a higher verbal projection, presumably the vP in (2a). The constituent structure of (at least) a subset of EO verbs involves a non-agentive stimulus as verbal complement and an experiencer in a higher position. The stimulus is hosted by the same projection as a patient. The bracketing in (2b) is common to older and recent accounts (e.g., Belletti and Rizzi 1988, Landau 2010), whereas otherwise these accounts differ with respect to the labeling of the experiencer projection. The conflict between (2a) and (2b) arises in case marking, since the higher argument is a nominative argument in (2a) and a non-nominative argument in (2b). This difference arises from the assumption that the experiencer bears an inherent case, i.e., a case that is not determined by the structural configuration (Landau 2010).

(2) a. [$_{vP}$ agent [$_{VP}$ patient V]]
b. [$_{VP}$ experiencer [$_{V'}$ stimulus V]]

The crucial issue for our considerations is the bracketing (and not the labeling) in (2b), i.e., the statement that the experiencer is hosted by a higher position than the stimulus. The evidence for this statement is provided by phenomena relating to the hierarchical structure, most importantly from binding facts. Experiencers of non-agentive EO verbs have been argued to bind stimuli, a property that is taken as evidence for a c-command relation between the binder and the bindee (Postal 1971; Belletti and Rizzi 1988; Pesetsky 1987, 1995; Reinhart 2002). Furthermore, non-agentive EO verbs do not allow for canonical passivization (Belletti and Rizzi 1988; Grimshaw 1990; Landau 2010). Experiencer objects are argued to be extraction islands in contrast to canonical direct objects (Belletti and Rizzi 1988). All these properties (so called 'psych properties') create a contrast between the experiential domain and the non-experiential domain (cf. Landau 2010).

Discourse-based accounts assume that arguments which refer to individuals experiencing mental states are very likely to be topics, which may trigger the early occurrence in an utterance (Bickel 2004; Haspelmath 2001; cf. Bouchard 1995 for an account of more general functional properties). This view is empirically supported by evidence from languages with topic positions. Experiencers in these languages are frequently realized in the topic position, which is arguably not a subject position (see É. Kiss 2005, Rákosi 2006 for Hungarian).

The notion of 'topic' that applies to these cases is the notion of aboutness topic: the intuition is that experiential predicates may be used as statements about the experiencing individual without contextual requirements (i.e., in all-new contexts), whereas such utterances are less likely to occur for patients of canonical verbs. This idea motivates the prediction in (3) that opens an interesting empirical question for typological research.

(3) Experiencers and aboutness
If experiencer-fronting is triggered by aboutness, then it is expected to occur in constructions that are used for aboutness topics.

2.2. Word order in the languages under investigation

All examined languages have flexible word order that is sensitive to information structure. Greek and Hungarian are VO languages (both analyzed as basic VSO; see É. Kiss

1998 for Hungarian; Philippaki-Warburton 1982 and Alexiadou and Anagnostopoulou 2001 for Greek). Both languages have a left-peripheral topic position that can be morphologically distinguished from the focus position (see É. Kiss 1998 for Hungarian; Alexiadou and Anagnostopoulou 2000 for Greek). In both languages, subjects of transitive verbs are very likely to appear in this position – even when lacking a contextual trigger, which results in the SVO order being the most frequent order in discourse (see Lascaratou 1989 for Greek and Behrens 1982 for Hungarian). The frequency of preverbal subjects in these languages does not imply an argument position in the left periphery. It results from a preference for filling the preverbal domain in general, except if the utterance comes with an event-focus realization. É. Kiss (2003: 40) observes for Hungarian that the topic position must be filled with an aboutness topic in stative sentences without a preverbal focus or quantifier. Accounts on Greek word order assume the existence of structural rules that force the preposing of subjects out of the V-initial structure (Alexiadou and Anagnostopoulou 2001; Spyropoulos and Revithiadou 2007).

Although the preference for preverbal subjects may be similar in both languages, it is not accidental that analyses based on Hungarian data refer to 'aboutness topics' and corresponding analyses for Greek refer to 'topical subjects'. The topic position in Hungarian can host any argument that is specific and referential (É. Kiss 2003: 36-40). In Greek, topical non-nominative arguments are topicalized in a particular construction, namely clitic left dislocation (henceforth CLLD), which involves a coreferential clitic replicating the topic (Tsimpli 1995; Alexiadou and Anagnostopoulou 2000). Clitic left dislocation is used for contrastive topics or topics serving as links to the Common Ground (Alexopoulou and Kolliakou 2002; Skopeteas and Fanselow 2009) or hanging topics (see Anagnostopoulou 1997; Grohmann 2003), but not for aboutness topics. This creates a subject/object asymmetry with respect to the possible triggers of topic fronting in Greek that does not apply for Hungarian.

German and Korean are basic OV languages. Both languages allow for scrambling objects over the subjects (for German see Fanselow 2003; Müller 2004; Frey 2004, 2005; for Korean see Frank et al. 1996; see also corpus findings in Bader and Häussler 2010 for German). Scrambling can be triggered by interaction of several factors, including definiteness, animacy, focus, etc. (Müller 2004). A particular property of Korean syntax is a set of constraints blocking deviations from the basic word order known as 'freezing effects'. Loss of word order freedom is observed in structures in which the morphological case is not visible or where a disharmonic mapping between animacy and thematic role hierarchy hinders the parsing of argument structure (Lee, H. 2001; Lee, E. 2007). German main declarative clauses have an obligatory rule for fronting finite verbs to a higher clausal position (Thiersch 1978; Den Besten 1989). The prefield of verb-second clauses is obligatorily filled, which induces formal movement of the first eligible element in the middlefield (see Frey 2006). Returning to the relevant issue for our considerations, the potential for OS order in scrambling languages like German and Korean is not reserved to a particular type of topics and may thus also apply to aboutness topics.

Concluding, the word order facts presented in this section indicate that there are two types of languages with respect to the discourse conditions that may trigger fronting of a lower argument. In scrambling languages (German and Korean) as well as in Hungarian, aboutness can trigger object fronting in the clause structure. Greek differs from these languages in that fronting an object to the topic position is an instance of clitic left dislocation that requires a stronger contextual trigger than aboutness (e.g., contrastive topicalization). This typological difference is relevant for the question of the origin

of EXPERIENCERFIRST effects. If EXPERIENCERFIRST purely refers to the hierarchical clause structure, then we would not expect to find fronting of experiencers to positions designated for information structure, e.g., fronting to topic positions in Greek and Hungarian. If EXPERIENCERFIRST relates to the aboutness of experiencer arguments, then its effects would be expected to appear in German/Korean scrambling and Hungarian topicalization, but not in Greek clitic left dislocation.

2.3. Experiencers in the languages under investigation

All examined languages have a subset of verbs that denote mental states or changes of state and take an experiencer argument where otherwise canonical direct or indirect objects are used. Previous research on intuition data from German, Greek, and Hungarian states that experiencers may occur in OS linearization[1] in all-new contexts (see German in Haider and Rosengren 2003; Greek in Anagnostopoulou 1999; Hungarian in Kiss 2005; Rákosi 2006). However, this generalization does not hold true for Korean accusative EO constructions (Verhoeven 2008; see discussion below).

An interesting fact in light of the discussion in Section 2.2 is that the possibility to prepose experiencers out of the blue is reported for languages such as Hungarian and Greek, where the preposed argument is in a topic position – and not in a subject position. The utterance in (4) involves the accusative experiencer in the topic position, which can appear without a contextual trigger in Hungarian. It is judged equally as appropriate as its SVO counterpart in all-new contexts (É. Kiss 2005, Rákosi 2006).

(4) Hungarian
János-t *zavarja* *a* *zaj*.
John-ACC disturbs the noise
'John is disturbed by the noise.' (É. Kiss 2005: 149)

Preverbal non-nominative arguments in Greek are clitic left-dislocated – unless they are focused; see example (5). The fronted object constituent is coreferent with the clitic pronoun *ton* '3.SG.ACC.M'. Clitic left-dislocation is a construction of contrastive topicalization (see Section 2.2). With experiencer verbs, the presence of a coreferential clitic has been judged to be obligatory (Anagnostopoulou 1999), which is, however, not confirmed in corpus data (Verhoeven 2009). A closer inspection of the felicity conditions of CLLD indicates that, as a peculiarity of experiencer verbs, CLLD does not exclude a focus on the left-dislocated argument (though it is excluded for the canonical left-dislocated patients).

(5) Greek
ton *đáskalo* *ton* *enđiaféri*
the.ACC.SG.M teacher:ACC.SG.M 3.SG.ACC.M interest:3.SG
o *maθitís*.
the.NOM.SG.M pupil:NOM.SG.M
'The teacher is interested in the pupil.'

The exceptional properties of experiencers occur with non-agentive stative EO verbs, but not with agentive (readings of the respective) EO verbs. Given that agentivity is a property of the verbal lexicon and as such subject to cross-linguistic variation, the contrast between agentive and non-agentive EO verbs does not necessarily appear in

the verbal lexicon of all languages. For German, Greek, and Hungarian, two subclasses of transitive EO verbs depending on agentivity have been identified (e.g., Scheepers 1997; Verhoeven 2010 for German; Anagnostopoulou 1999; Kordoni 1999; Author 2010 for Greek; Rákosi 2006 for Hungarian). Some accusative EO verbs in these languages only allow a non-agentive reading, e.g., German *interessieren* 'interest', *wundern* 'wonder'; Greek *enδiaféri* 'interest', *provlimatízo* 'puzzle'; Hungarian *érdekel* 'interest', *aggaszt* 'worry, concern'. Other accusative EO verbs are ambiguous between an agentive and a non-agentive reading. Whether these readings are possible depends on the animacy of the stimulus: agentive readings are only possible if the stimulus is an animate conscious entity that can exercise control over the event. This is exemplified for German in (6a) vs. (6b): The sentence in (6a) is ambiguous between a non-agentive reading (e.g., 'something about the pupil bothers the teacher') and an agentive reading (e.g., 'the pupil [intentionally] bothers the teacher'), whereas the same structure with an inanimate stimulus only allows for a non-agentive reading.

(6) German

a. *Der* *Schüler* *ärgert*
the.NOM.SG.F pupil:NOM.SG.F bother:3.SG
den *Lehrer*.
the.ACC.SG.M teacher:ACC.SG.M
'The pupil is bothering the teacher.'

b. *Die* *Möbel* *ärgern*
the.NOM.PL.N furniture:NOM.PL.N bother:3.PL
den *Lehrer*.
the.ACC.SG.M teacher:ACC.SG.M
'The furniture bothers the teacher.'

Korean is peculiar in that it does not possess a subclass of non-agentive accusative EO verbs. Korean accusative EO verbs are causatives derived from intransitive verbs. Their animate stimuli may be interpreted as volitionally acting agents, see (7a), while their inanimate stimuli are conceived of as causer, see (7b).

(7) Korean[2]

a. *Suni-ka/-nun* *hayngin-ul* *yekkyep-key* *hayss-ta*.
Suni-NOM/-TOP pedestrian-ACC disgust-ADV do:PST-DECL
'Suni nauseated the pedestrian.'

b. *Kimchi(namsay)-ka/nun* *hayngin-ul* *yekkyep-key* *hayss-ta*.
Kimchi(smell)-NOM/TOP pedestrian-ACC disgust-ADV do:PST-DECL
'The (smell of) Kimchi nauseated the pedestrian.'

In sum, three languages in our sample (German, Greek, and Hungarian) have a class of accusative non-agentive EO verbs while Korean accusative EO verbs do not differ from canonical transitive verbs in their agentivity properties. Based on intuitive judgments, there is evidence for EXPERIENCERFIRST effects in the three languages with accusative non-agentive EO verbs, although these languages display different syntactic operations (scrambling, topicalization, clitic left-dislocation) for fronting lower arguments.

3. Experiencers and case-marking

Experiencer-objects come with two alternative case markings: some EO verbs are transitive verbs with an accusative experiencer-object (EO_{ACC}), e.g., *x annoys y*, and other EO verbs are intransitives with a dative/oblique case marking of the experiencer object (EO_{DAT}), e.g., *x appeals to y*. Cross-linguistically, dative experiencer verbs are uniformly non-agentive and stative (Landau 2010; Reinhart 2002; Rákosi 2006). In a number of languages, dative experiencers have been analyzed as quirky subjects, most prominently in Icelandic (e.g. Zaenen et al. 1985), but also in Modern Greek (Anagnostopoulou 1999; Landau 2010) and Korean (Gerdts and Youn 2001; Kim 1990).

For German, acceptability and corpus studies show a robust preference for OS with datives in comparison to OS with accusatives (Kempen and Harbusch 2003; Haupt et al. 2008; Bader and Häussler 2010; Lamers and de Hoop forthc; Lamers and de Schepper 2010); see (8) for an example. Moreover, studies in speech comprehension show that the dative-nominative order in German does not provide evidence for reanalysis effects (Bornkessel et al. 2003, 2004).

(8) German

Dem	*Schüler*	*gefällt*	*der*	*Lehrer*.
the.DAT.SG.F	pupil:DAT.SG.M	please:3.SG	the.NOM.SG.M	teacher:NOM.SG.M

'The pupil likes the teacher.'

In Modern Greek, oblique experiencers are either marked in genitive case (9a) or expressed by a prepositional phrase (9b) (an alternation that also appears with indirect objects in Modern Greek). Genitive/prepositional experiencers in Greek share all the properties of datives in other languages and are therefore seen as the morphological spell-out of a dative case. There are no observations concerning differences between dative and accusative EO verbs in Greek; both types of experiencers are analyzed with as quirky subjects in the literature on this language.

(9) Greek

a.

To	*krasí*	*tu*	*arési*
the.NOM.SG.N	wine:NOM.SG.N	3.SG.GEN.N	please:3.SG

tu	*pétru*.
the.GEN.SG.M	Peter:GEN.SG.M

'The wine pleases Peter.' (Anagnostopoulou 1999:78/79)

b.

To	*krasí*	*arési*
the.NOM.SG.N	wine:NOM.SG.N	please:3.SG

s-ton	*pétro*.
LOC-the.ACC.SG.M	Peter:ACC.SG.M

'The wine pleases Peter.' (Anagnostopoulou 1999:69)

Korean dative EO verbs exhibit an alternation in case patterns: (a) dative experiencer - nominative stimulus, see (10a), and (b) double nominative pattern, see (10b) (which is a marked construction used for contrastive topics). The topic suffix replaces the nominative marker in Korean, which gives rise to the pattern in (10c). Dative experiencers generally allow for free reordering, whereas the word order of double nominative constructions remains 'experiencer-before-stimulus'. Word order freezing also applies when the dative experiencer is honorified (Lee, H. 2001: 42). It is crucial that the

frozen order in this case is 'dative-nominative', whereas the frozen order with EO accusative verbs is 'nominative-accusative'. This is evident from examples with preposed topic-marked objects such as in (11), in contrast to (7b), which are clearly dispreferred or even judged as ungrammatical by native speakers (Shin and Verhoeven 2009).[3] These phenomena imply that the basic order of accusative and dative experiencers is different.

(10) Korean
a. *Chelswu-eykey Mia-ka mwusewess-ta.*
Chelswu-DAT Mia-NOM be.frightening:PST-DECL
'Mia was frightening to Chelswu'
b. *Chelswu-ka Mia-ka mwusewess-ta.*
Chelswu-NOM Mia-NOM be.frightening:PST-DECL
'It was Chelswu (not Swuni) to whom Mia was frightening'
c. *Chelswu-nun Mia-ka mwusewess-ta.*
Chelswu-TOP Mia-NOM be.frightening:PST-DECL
'Mia was frightening to Chelswu' (Rudnitskaya 2005:138)

(11) Korean
*/??*hayngin-nun kimchi(namsay)-ka yekkyep-key hayss-ta.*
pedestrian-TOP Kimchi(smell)-NOM disgust-ADV do:PST-DECL
Intended: 'The pedestrian, the (smell of) Kimchi nauseated him.'

In Hungarian, there is no evidence that either accusative or dative experiencers are superior to the nominative argument.[4] Moreover, dative experiencers are not quirky subjects in this language (Rákosi 2006; for an opposing view, see Dalmi 2005). Dative-first orders with EO_{DAT} verbs (see (12)) are judged to be equally as felicitous in neutral contexts, as are accusative-first orders with EO_{ACC} verbs (Rákosi 2006). However, it has to be taken into account that placement in the topic position is only possible with specific datives/accusatives in Hungarian. The fact that experiencers are able to occur in the topic position in all-new contexts reflects a discourse preference to make statements about individuals involved in experiential events (Rákosi 2006; É. Kiss 2005).

(12) Hungarian
Péter-nek tetsz-ik Kati.
Peter-DAT appeal.to-3.SG Kati
'Kate appeals to Peter.' (Rákosi 2006:176)

Relevant for understanding the linearization properties of experiencer-objects is that, at least in some languages, a dative/accusative asymmetry has been reported; this is summarized in (13). Previous research provides evidence for this asymmetry in German and in Korean, whereas in Hungarian it has been observed that there is no difference between dative and accusative experiencers. It is not clear whether a similar generalization applies to Greek experiencer-objects.

(13) DATIVEFIRST
A dative argument is more likely than an accusative argument to occur before the nominative argument in the linearization.

The crucial question is where the difference between dative and the accusative comes from and why this difference occurs in some languages and not in others. The first possibility is to assume that the observed asymmetry directly reflects a syntactic difference such that only with dative verbs the non-nominative occupies a higher position than the nominative. Indeed, some previous studies have pointed out that the empirical evidence for the higher status of experiencers is straightforward for dative verbs, whereas the empirical situation is not clear for the majority of accusative EO verbs (Fanselow 2000, 2003; Wegener 1998).

Alternatively, the dative/accusative asymmetry may relate to performance principles that influence linearization preferences. Two phenomena of this type might apply to the problem at issue: first, preferences against ambiguity risks occur whenever morphological case is not distinctive enough or second, compensatory effects arise whenever an alternative construction is available.

In many languages, morphological case is not always a valid cue for recognizing thematic roles. In German, for instance, nominative/accusative DPs are ambiguous in case for many inflectional paradigms, but nominative and dative are consistently distinguished by the determiners and/or the inflectional form of the noun. The ambiguity risk with accusative arguments may have a blocking effect on deviations from canonical word order. The distinctness of morphological cases in the examined languages is gradient, following the scale in (14). In Hungarian and Korean, accusatives are distinguished from nominatives with agglutinative suffixes, establishing a clear and transparent contrast between case forms. In Greek, there is a clear nominative/accusative contrast for masculine and feminine DPs for both numbers (expressed by the determiner and the inflectional form of the noun) while neuter DPs are ambiguous for nominative/accusative (but not so for dative). If the dative/accusative asymmetry is caused (at least in part) by case detectability, we expect the size of the asymmetry to correlate negatively with the scale in (14).

(14) Case distinctness
Hungarian/Korean > Greek > German

A further line of argument relates to the availability of alternative constructions that may be selected for an alternative linearization of the theta roles. For instance, in German and Dutch, EO accusative verbs have non-active counterparts that may be selected for an experiencer-first linearization. This option is not available for dative EO verbs, which may account for the higher frequencies of dative-first constructions in speech production (Lamers & de Hoop forthc; Lamers & de Schepper 2010). Thus, the accusative/dative contrast may simply be the compensatory effect of the presence of alternative constructions for accusative arguments. The accusative EO verbs of all languages in our sample have anticausative/deagentive counterparts with an 'experiencer $\prec$ stimulus' linearization in the canonical order, while this option is not available for dative EO verbs. In German, experiencer-oriented verbs are anticausatives (15a) or stative passives (15b). In Greek, many accusative EO verbs have mediopassive counterparts with an experiencer subject; see (15c). In Hungarian, the verbal alternates are formed with different suffixes; see (15d). In Korean, the causative verb is a derived form and the basis is a non-agentive intransitive verb; see (15e). Thus, if the dative/accusative asymmetry results from the compensatory effects of alternative constructions, it is expected to apply to all languages in our sample.

(15) a. German anticausative
x *interessiert* y ‘x interests y’
y *interessiert sich für* x ‘y is interested in x’
b. German stative passive
x *widert* y *an* ‘x disgusts y’
y *ist angewidert von* x ‘y is disgusted by x’
c. Greek mediopassive
x *enðiaféri* y ‘x interests y’
y *enðiaférete ja* x ‘y is interested in x’
d. Hungarian suffixation
x *érdekel* y ‘x interests y’
y *érdeklődik* x *iránt* ‘y is interested in x’
e. Korean causativization
x y *pwukkulepkey hata* ‘x shames y’
y x *pwukkulepta* ‘y is ashamed of x’

4. Research aims

The aim of this study is to obtain precise data about EXPERIENCERFIRST effects across languages which allow us to compare intuitions of native speakers in a controlled setting. Based on our findings, we are going to draw conclusions about the sources of the effects obtained by examining their interactions with relevant grammatical properties. Language comparison will be used as a method to disentangle conflicting hypotheses about the source of particular effects. Our aim is to answer the following research questions for accusative and dative experiencers:

(16) a. Is there an EXPERIENCERFIRST effect in the languages under investigation? If yes, is the size of this effect identical across languages or do languages differ in this respect?
b. If the size of the EXPERIENCERFIRST effect differs between languages, which typological properties account for such differences? In particular, to what extent are these differences related to differences in the syntactic structure?
c. How do EXPERIENCERFIRST effects interact with contextually licensed fronting? In particular, are the syntactic operations appearing in EXPERIENCERFIRST effects a subset of the syntactic operations triggered by topicalization?

In order to answer these questions, we designed an experiment on accusative experiencers and an experiment on dative experiencers, which were both carried out in parallel in German, Greek, Hungarian, and Korean. Both experiments compared the effects of experiencer-fronting with the effects of contextually licensed fronting in verbs with experiencer-arguments and similar constructions with non-experiencer arguments. The relevant differences between the languages at issue are summarized in Table 1.

Table 1. *Sample languages*

	German	Greek	Hungarian	Korean
fronting operation	scrambling	CLLD	topicalization	scrambling
non-agentive EO verbs	yes	yes	yes	no
case distinctness	low	middle	high	high
dative/accusative asymmetry	yes	unclear	no	yes
freezing effects	no	no	no	yes

5. Method

This section presents the methodological background of the empirical study. The experimental factors are introduced in Section 5.1 and the material and procedure are outlined in Section 5.2. Section 5.3 introduces the methods used for data analysis.

5.1. Experimental factors

We designed two separate experiments, one for the accusative verbs and one for the dative verbs. Both experiments have the same design, examining the impact of VERB CLASS and CONTEXT on the choice of word order, as outlined in (17).

(17) a. dependent variable
WORD ORDER (2 levels): OS vs. SO
b. fixed factors
CONTEXT (2 levels): object-topicalization licensing vs. neutral
VERB CLASS (2 levels): experiencer verb vs. non-experiencer verb

The target sentences were constructed in two versions, namely SO and OS; see German example (18). Illustrative sentences of the other languages as well as a discussion of the necessary adaptations are given in the subsections on the individual languages in Section 6. The factor CONTEXT provides evidence for the possibility to use the constructions at issue under conditions that license topic-fronting. We compare the effect of a context licensing object topicalization with an all-new context establishing the baseline. The neutral context was induced with the generic question 'What's new?' preceding the target sentence. The context licensing object topicalization was established by a set-member relationship between the discourse topic (subject of the context sentence) and the non-nominative argument of the target sentence. This relationship is known to induce topicalization (see 'partial topics' in Büring 1999); an experimental setting with a similar manipulation is reported in Weskott et al. (2011), which has shown that part-whole relationships have a strong effect on licensing object-fronting in German.

(18) Context:
Die meisten Sportler hatten keine Lust auf das Training.
'Most athletes were not in the mood for training.'
Targets:
SO: *Die Übung hat dem Turner gefallen.*
OS: *Dem Turner hat die Übung gefallen.*
'(SO/OS) The gymnast was pleased by the routine.'

Since definiteness, animacy and agentivity are known to influence the linearization, they have to be controlled for in experiments on word order. Notably, animacy and agentivity effects may interfere with possible experiencer effects on word order. In the present experiments, animacy-first effects are controlled for by having all relevant structures contain an inanimate nominative DP and an animate non-nominative DP. Since the animacy configuration is kept constant, effects of animacy do not interfere with the experimental conditions at issue. Additionally, agentive readings of the experiential and causative verbs are also eliminated by the use of inanimate nominatives that cannot exercise conscious control over the event. In order to control for definiteness, we only included structures containing two definite DPs.

The implemented set-member relationship for contextual licensing of object fronting concerns the animate non-nominative argument that is part of a group which is denoted by a salient antecedent (this manipulation differs from the material used in Weskott et al. 2011, which contained part-whole relations with inanimates). Furthermore, as is evident from (18), we induced a contrast reading between the statement in the target sentence and the expectations implemented in the context sentence. A context inducing a non-contrastive reading of (18) would be: *Most athletes were in the mood for training*. The adversative relation between the context and the target sentence enhances the licensing effect. In a pilot forced-choice study in German we found that adversativity facilitates object-fronting: OS order was chosen in 78% of the cases with the adversative material (n = 128; 8 speakers), while it was chosen in only 63% of the cases with the non-adversative material (n = 128; 8 speakers). Hence, adversativity strengthens the effect of contextual licensing. However, it is not a necessary condition for object-topicalization (Weskott et al. 2011 obtained object-fronting in German without similar manipulations).

The factor VERB CLASS has to disentangle the fronting effect of EO verbs from a baseline established by comparable constructions. In the accusative experiment, we established the baseline with causative transitive verbs governing a patient object. For each language, we selected sixteen EO_{ACC} verbs and sixteen causative transitive verbs by relying on the available literature about the respective verb classes and through elicitations with native speakers; see verbs in Appendix A. Hence, the items are nested in the factor VERB CLASS in this experimental design. The selection of the verbs was made on the basis of qualitative elicitation with native speakers in order to achieve a list of items (with the intended animacy configuration) that is maximally natural in the respective language. As far as possible, these lists are translational equivalents of the German material that was created first, but adaptations of individual items were necessary in compliance with the verb inventory of each language as well as idiosyncratic preferences with respect to the naturalness of the target sentences.

In the dative experiment, EO_{DAT} verbs were compared to unaccusative change of state verbs that can be construed with an unintentional causer/affectedness dative; see German example in (19a). Similar to the accusative experiment, we collected for each language sixteen EO_{DAT} verbs and sixteen unaccusative verbs which combine with a causer/affectedness dative. Unintentional causers are external arguments hosted by the specifier position of an applicative phrase (ApplP) located above the VP (Schäfer 2007, 2009), i.e. these datives are expected to precede the nominative argument of unaccusative verbs in the linearization. Assuming that the dative experiencer is also a higher argument than the nominative stimulus, the question is whether experiencer datives differ from unintentional causers in linearization. Semantically, these constructions vary

between readings implying that the higher argument involuntarily causes an event and readings in which the higher argument is affected (Ganenkov et al. 2008: 177). The same construction was used in Greek with a genitive-marked oblique causer (Rivero 2004: 238). In Hungarian, this construction does not occur directly, although the Hungarian dative is a so-called 'affectedness dative', also appearing in external possession (see Lambert 2010; Haspelmath 1999). The closest correspondence to the unintentional causer construction which we used in the Hungarian dative experiment is illustrated in (19b). Following Rákosi (2014), the default reading of this construction is the following reading: 'the participant finally (as a result of efforts) succeeds in doing something, although it is not quite expected' (Ganenkov et al. 2008: 177). In contrast to the (grammaticalized) unintentional causer construction, the Hungarian construction is unrestricted as to the transitivity and telicity of the predicate occurring in it. The acceptability of this construction increases with the use of an adverb that makes the intentional contribution of the dative-marked participant explicit (e.g., *könnyen* 'easily'). Given the causative/agentive semantics and the compatibility with any predicate, the structural position of the Hungarian dative causer should be equally superior to that of the VP.

Korean belongs to the group of languages in which the dative case prototypically has spatial uses (Lambert 2010: XV). The encoding of an oblique causer of the type we described for the other languages is not available in Korean. The closest translational equivalent in Korean are constructions with verbs implying motion and taking an affected individual marked in the dative, as illustrated in (19c). However, the syntax of these constructions is crucially different: the dative phrase is the directional complement of these verbs, hence it is a VP complement and as such lower than the nominative phrase in clause structure.

(19) a. German (dative exp., non-experiencer verb, OS)
Dem *Hilfskoch* *ist*
the:DAT.SG.M assistant.cook:DAT.SG.M be:3.SG
der *Nachtisch* *angebrannt*.
the.NOM.SG.M dessert:NOM.SG.M burn:PTCP.PERF.PASS
'The cook's assistant unintentionally burnt the dessert.'

b. Hungarian (dative exp., non-experiencer verb, SO)
A *tészta* *gyorsan* *megfőtt* *a* *szakács-nak.*
the noodles quickly cook:PST the cook-DAT
'The cook (finally) succeeded in cooking the noodles quickly.'

c. Korean (dative exp., non-experiencer verb, OS)
silsupsayng-eykey *kilum-i* *thwiess-ta.*
assistant.cook-DAT oil-NOM splatter:PST-DECL
'The oil splattered on the assistant cook.'

5.2. Material and procedure

The experiment was designed as a forced-choice test (with two options). This procedure involves a decision between two competing alternatives representing the choice of interest. The outcome is a relative judgment, which avoids the problem of absolute judgments not being anchored to a base.

Based on a latin-square design, we created 16 pseudo-randomized lists, each containing 16 items (8 items of each VERB CLASS). Each item represented one of the levels of CONTEXT, so that each list contained four repetitions of each experimental condition.

The targets were mixed with filler items that also present a decision between an SO and an OS order (32 fillers in the accusative experiment, 40 fillers in the dative experiment). Each item was presented as two context-target pairs (context C with target alternative A and context C with target alternative B). For any particular context, test subjects were instructed to choose the best among two options where both represent the same content (an SO and an OS version). The experiments were run as web-based studies (implemented in OnExp[5]). Each experimental session took approximately 15 minutes and was unpaid. 32 monolingual native speakers took part in each experiment, as outlined in Table 2. The links to the website of the experiments were distributed by associate researchers in the countries in which the relevant languages are spoken. All participants took part in only one of the two experiments per language.

Table 2. *Participants of the experimental studies*

		n	women	age range	age average	period
German	accusative	32	20	*23-34*	28.3	08/12-09/12
	dative	32	21	*21-37*	28.7	08/12-09/12
Greek	accusative	32	26	*20-33*	24.2	07/13-08/13
	dative	32	20	*21-36*	27.8	07/13-08/13
Hungarian	accusative	32	22	*20-35*	23.1	06/13-07/13
	dative	32	26	*21-36*	26.3	06/13-07/13
Korean	accusative	32	26	*20-38*	25.9	09/13-10/13
	dative	32	22	*20-38*	26.2	09/13-10/13

5.3. Data analysis

The obtained data consists of frequencies for two complementary options, SO and OS, for four experimental conditions. In order to draw statistic inferences, we fitted generalized linear mixed-effects models on the data. In all following analyses, the fixed factors are VERB CLASS (non-experiencer; experiencer) and CONTEXT (object-topicalization licensing; neutral). Contrasts between factor-levels were modeled such that the level of interest (VERB CLASS: experiencer; CONTEXT: object-topicalization licensing) is compared to its complement (VERB CLASS: non-experiencer; CONTEXT: neutral) as a baseline. The estimates in the following result tables represent the effect of the level of interest whereby the baseline is assumed to be zero.

Participating SUBJECTS and ITEMS were modeled as random factors. The model contained the intercepts, the slopes of both random factors with CONTEXT, and the slope of the factor SUBJECTS with ITEMS (ITEMS were nested within VERB CLASS). The random-effects structure was kept constant in all experiments without factor-reduction procedures following proposals in Barr et al. (2013), which warrants the comparability of the cross-linguistic findings. The significance of the fixed effects was estimated with a log-likelihood test on model comparison. For the significance of the interaction effects, we compared a model containing both fixed factors and their interaction with a model in

which the interaction was removed. For estimating the significance of the main effects, we compared a model with two main effects with a model in which the effect of interest was removed. All log-likelihood tests are minimal pairs with the same random-effect structure, only differing in the presence/absence of the effect of interest; hence, the chi-square values constantly have $df = 1$. All analyses reported in this article were performed in *R* (R Core Team 2013, Version 3.0.2).

6. Results

6.1. German

In the German experimental target structures we used main declarative clauses, with an auxiliary in the second position and a clause-final lexical verb; see (20a). In the OS version, the non-nominative argument precedes the finite verb (prefield position) and the nominative argument follows the finite verb in the middlefield; see (20b).

(20) German (accusative exp., experiencer verb)

a. *Der* *Umsatz* *hat*
the:NOM.SG.M sales:ACC.SG.M have:3.SG
den *Fleischer* *erfreut.*
the:ACC.SG.M butcher:ACC.SG.M please:AOR:3.SG
'The sales made the butcher happy.'

b. *Den Fleischer hat der Umsatz erfreut.*

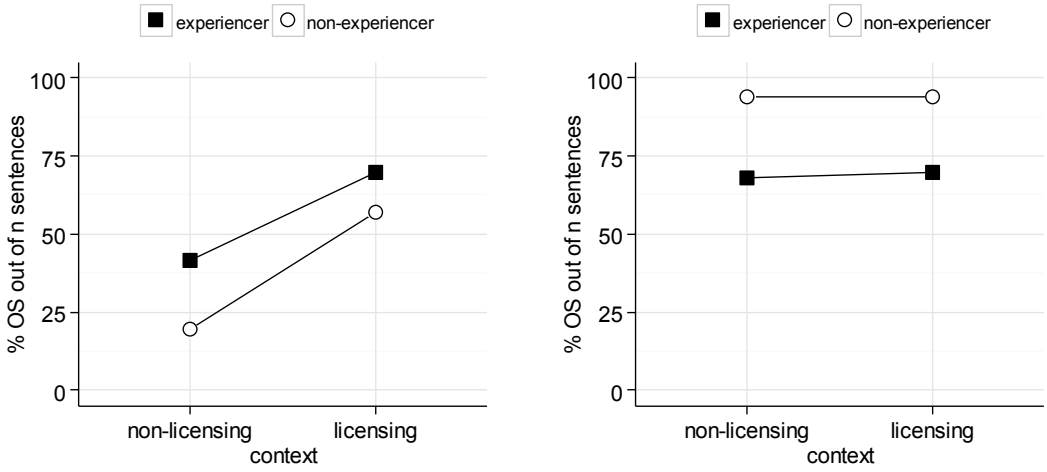
The obtained choices per condition are summarized in Table 3 and visualized in Figure 1. There are no missing values in our dataset, i.e. the OS and SO data sum up to 128 for every condition in both experiments. The results of the accusative experiment suggest that both factors at issue have independent effects that are cumulated in the individual conditions. Starting with the accusative objects, the proportions of OS orders in the non-licensing context reveal a difference: 20% OS order for non-experiencers vs. 41% for experiencers. The object-topicalization context has an additive effect, raising the proportions of OS to 57% for non-experiencers and 70% for experiencers. The proportions of OS in the dative data are generally higher. The OS orders are more frequent with non-experiencer dative constructions and the context does not exercise a substantial influence.

Table 3. *Frequencies of OS/SO in German*

		experiencer verbs				non-experiencer verbs				total	
		non-licensing		licensing		non-licensing		licensing			
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
accusative	OS	*53*	41	*89*	70	*25*	20	*73*	57	*240*	47
	SO	*75*	59	*39*	30	*103*	80	*55*	43	*272*	53
dative	OS	*87*	68	*89*	70	*120*	94	*120*	94	*416*	81
	SO	*41*	32	*39*	30	*8*	6	*8*	6	*96*	19

Figure 1: *Proportions of OS in German*

(a) accusative (b) dative



The observations in the descriptive data are justified by the generalized linear mixed-effects model, whose parameters are summarized in Table 4. For the accusative data, the impacts of the factors CONTEXT and VERB CLASS are significant, but do not interact significantly. The estimates reveal that CONTEXT has a stronger influence than VERB CLASS. In the dative data, the only explanatory factor is VERB CLASS, which captures the increased occurrence of OS orders with non-experiencer verbs.

Table 4. *Model parameters: German experiments*

	fixed factor	estimate	$\chi^2(1)$	*p*
accusative	intercept	–1.95		
	VERB CLASS (experiencer)	1.55	16.2	< .001
	CONTEXT (licensing)	2.55	12.9	< .001
	VERB CLASS^CONTEXT	–.48	.7	= .3
dative	intercept	2.81		
	VERB CLASS (experiencer)	–1.93	29.8	< .001
	CONTEXT (licensing)	.42	.1	= .8
	VERB CLASS^CONTEXT	–.39	.3	= .5

6.2. Greek

In Greek, the OS sentences contain a clitic pronoun that is coreferent with the preposed argument (this is the CLLD construction; see Section 2.2 for discussion); see (21a). The clitic had to occur in both SO and OS orders in the oblique experiment, because native speakers judged the versions without clitic doubling as only possible under restricted

contextual conditions that do not apply in our setting (namely, narrow focus on the preverbal argument); see (21b).

(21) a. Greek (accusative exp., experiencer verb, OS)

Ton	*aɣróti*	*ton*	*χaropíise*
the:ACC.SG.M	farmer:ACC.SG.M	3.SG.ACC.M	please:AOR:3.SG
i	*vroχí*.		
the:NOM.SG.F	rain:NOM.SG.F		

'The farmer, the rain made him happy.'

b. Greek (oblique exp., experiencer verb, SO)

I	*patríða*	*tu*	*élipe*
the:NOM.SG.F	homeland:NOM.SG.F	3.SG.GEN.M	lack:AOR:3.SG
tu	*oðiɣú*.		
the:GEN.SG.M	driver:GEN.SG.M		

'The driver missed his home(land).'

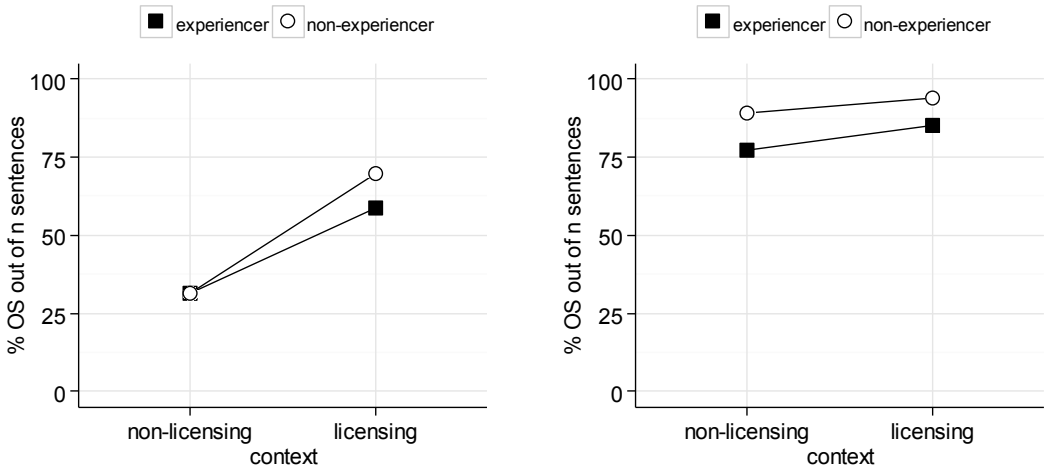
The obtained frequencies are summarized in Table 5 (see OS proportions in Figure 2). The frequencies of OS with accusative verbs are identical for both verb classes in the non-licensing contexts (31%). The probability of choosing OS increases in contexts licensing object topicalization, whereby a slight advantage for non-experiencer verbs is observed. In the dative data, OS orders are generally more frequent. Similar to German, the OS order appears more frequently with non-experiential obliques (89% vs. 77% in neutral context). Moreover, Figure 2b suggests an effect of CONTEXT with Greek obliques, which is, however, not as strong as the corresponding effect of CONTEXT in the accusative data (compare Figure 2a with Figure 2b).

Table 5. *Frequencies of OS/SO in Greek*

		experiencer verbs				non-experiencer verbs				total	
		non-licensing		licensing		non-licensing		licensing			
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
accusative	OS	*40*	31	*75*	59	*40*	31	*89*	70	*244*	48
	SO	*88*	69	*53*	41	*88*	69	*39*	30	*268*	52
oblique	OS	*99*	77	*109*	85	*114*	89	*120*	94	*442*	86
	SO	*29*	23	*19*	15	*14*	11	*8*	6	*70*	14

Figure 2: *Proportions of OS in Greek*

(a) accusative (b) oblique



The generalized linear mixed-effects model reveals a main effect of CONTEXT in both experiments (see parameters in Table 6). In the accusative data, this is the only significant effect. The oblique data only show a significant effect of VERB CLASS while the putative effect of CONTEXT turns out not to be significant.

Table 6. *Model parameters: Greek experiments*

	fixed factor	estimate	$\chi^2(1)$	*p*
accusative	intercept	–.97		
	VERB CLASS (experiencer)	.09	.7	= .4
	CONTEXT (licensing)	1.91	20.9	< .001
	VERB CLASS^CONTEXT	–.54	1.3	= .2
oblique	intercept	2.69		
	VERB CLASS (experiencer)	–1.13	6.7	< .01
	CONTEXT (licensing)	.66	1.3	= .3
	VERB CLASS^CONTEXT	–.12	.06	= .8

The results obtained for Greek are similar to the findings in German. The crucial difference is the lack of an effect for experiencer verbs in the accusative data. The overall frequency of OS order is slightly higher in Greek (686 out of 1024 tokens, i.e. 67%) than in German (656 out of 1024, i.e. 64%).

6.3. Hungarian

The first argument of the Hungarian experimental target structures appeared in the topic position for both SO and OS. The particle of the items with particle verbs was placed

in front of the verb, which guarantees that the preverbal argument is a topic (since preverbal focus attracts the finite verb, stranding the particle in the postverbal domain (É. Kiss 1998); see (22a). For the dative experiment, we used preverbal adverbs with both experiencer and non-experiencer verbs, since these adverbs were judged necessary for the interpretation of the intended reading of the unintentional causer construction; see (22b), compare with (19b) (see discussion in Section 5.1).

(22) a. Hungarian (accusative exp., experiencer verb, OS)
A rabló-t meg-félemlítette a fegyver.
the robber-ACC PTCL-frighten:PST the weapon
'The robber, the weapon frightened him.'

b. Hungarian (dative exp., experiencer verb, SO)
Az áru nagyon ízlett a hentes-nek.
the goods very taste:PST the butcher-DAT
'The goods were very tasteful for the butcher.'

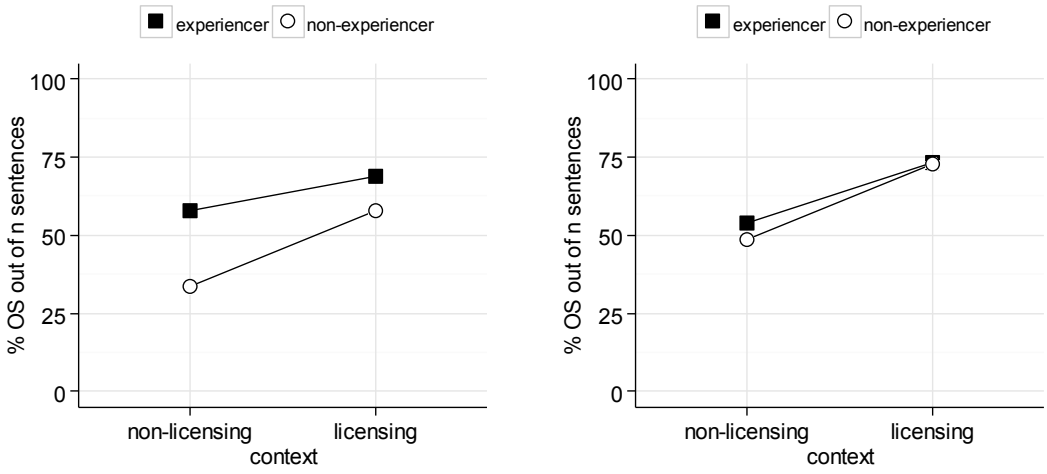
The Hungarian findings are presented in Table 7 and Figure 3. The data for the accusative experiment show that OS is more frequent for experiencer verbs than for non-experiencer verbs (58% vs. 34% in non-licensing contexts). Contextual licensing has an additional effect on the frequency of OS orders for both verb classes, but has a greater impact on non-experiencer constructions. As for the dative data, contextual licensing results in an increase of OS frequency (by approximately 20%) for both verb classes, though these do not differ from each other. Unlike the German and Greek data, the overall frequency of OS orders is similar in the accusative (279 out of 512 tokens, i.e. 54%) and the dative data (318 out of 512 tokens, i.e. 62%).

Table 7. *Frequencies of OS/SO in Hungarian*

		experiencer verbs				non-experiencer verbs				total	
		non-licensing		licensing		non-licensing		licensing			
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
accusative	OS	*74*	58	*88*	69	*43*	34	*74*	58	*279*	54
	SO	*54*	42	*40*	31	*85*	66	*54*	42	*233*	46
dative	OS	*69*	54	*94*	73	*62*	48	*93*	73	*318*	62
	SO	*59*	46	*34*	27	*66*	52	*35*	27	*194*	38

Figure 3: *Proportions of OS in Hungarian*

(a) accusative (b) dative



The generalized linear mixed-effects model reveals that both VERB CLASS and CONTEXT are relevant explanatory variables for the frequency of OS order in the accusative data (see Table 8). The findings in the dative experiment reveal a strong effect of CONTEXT, but no effect of VERB CLASS. There is no interaction effect in either experiment.

Table 8. *Model parameters: Hungarian experiments*

	fixed factor	estimate	$\chi^2(1)$	p
accusative	intercept	–.88		
	VERB CLASS (experiencer)	1.25	8.2	< .01
	CONTEXT (licensing)	1.27	12.7	< .001
	VERB CLASS^CONTEXT	–.67	2.5	= .1
dative	intercept	–.07		
	VERB CLASS (experiencer)	.24	.2	= .7
	CONTEXT (licensing)	1.19	17.1	< .001
	VERB CLASS^CONTEXT	–.28	.4	= .5

The findings of the accusative experiment in Hungarian are very similar to the respective German results in that they show two main effects which do not interact with each other. The dative results differ from the German and Greek results in showing an effect of CONTEXT, but not of VERB CLASS. However, the most salient difference is that the overall frequency of OS is similar for accusative and dative verbs, which is clearly not the case for German and Greek.

6.4. Korean

Korean is a language with morphological topic-marking, so that a given subject and/or object could be either case-marked and/or topic-marked in the experimental target structure. The Korean sentences required the use of case-marked DPs (instead of topic-marking) in order to be able to observe the pure effect of word order and to avoid the freezing effects that arise when replacing case suffixes with the topic marker;[6] see illustrative examples in (23). Instead of an unintentional causer construction, which is not available in Korean, we used a construction with a directional dative implying affectedness of the respective individual by a motion event encoded in an intransitive verb; see (19c) and discussion in Section 5.1.

(23) a. Korean (accusative exp., experiencer verb, SO)
pi-ka *nongpwu-lul* *humwusha-key* *hayss-ta.*
rain-NOM farmer-ACC happy-GER do:PST-DECL
'The rain made the farmer happy.'

b. Korean (dative exp., experiencer verb, SO)
kohyang-i *wuncenkisa-eykey* *kuliwess-ta.*
homeland-NOM driver-DAT lack:PST-DECL
'The driver missed his home(land).'

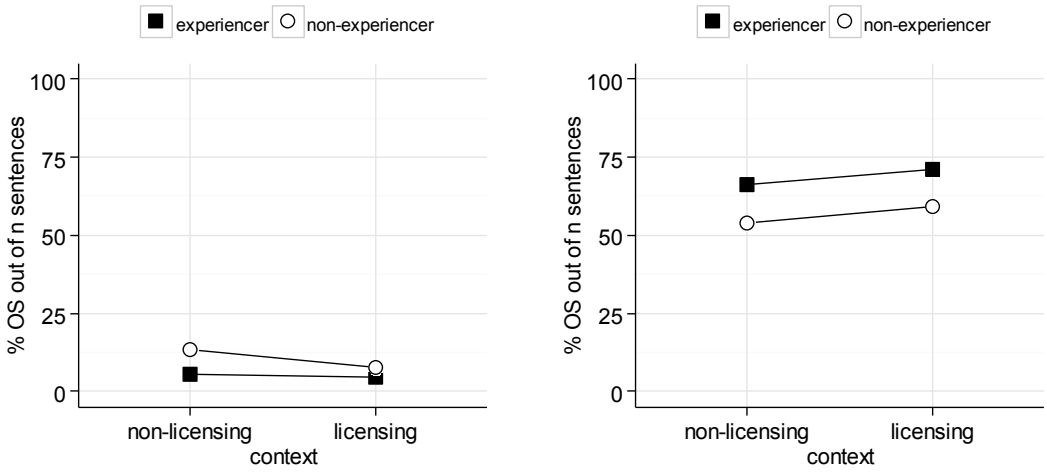
The Korean data differs from all previous languages; see frequencies in Table 9 and OS proportions in Figure 4. The accusative data reveal a striking result: under all four conditions, the OS order is only rarely attested (with a slight advantage for non-experiencer verbs in non-licensing contexts). The frequency of OS is not increased by the factors at issue here, i.e., verb class and contextual licensing. The dative results are less peculiar: OS order is the most frequent option in this part of the dataset (321 out of 512 tokens, i.e. 63%). Two effects can be seen: the frequency of OS increases for experiencer verbs and for OS-licensing contexts. Independently of CONTEXT, experiencer verbs show a higher proportion of OS orders (176 out of 256 tokens, i.e. 69%, for experiencer verbs in both contexts vs. 145 out of 256 tokens, i.e. 57%, for non-experiencer verbs in both contexts). Equally, verbs in licensing contexts show a higher proportion of OS orders independently of VERB CLASS (167 out of 256 tokens, i.e. 65%, for verbs in licensing contexts vs. 154 out of 256 tokens, i.e. 60%, for verbs in non-licensing contexts).

Table 9. *Frequencies of OS/SO in Korean*

		experiencer verbs				non-experiencer verbs				total	
		non-licensing		licensing		non-licensing		licensing			
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
accusative	OS	*7*	5	*6*	5	*17*	13	*10*	8	*40*	8
	SO	*121*	95	*122*	95	*111*	87	*118*	92	*472*	92
dative	OS	*85*	66	*91*	71	*69*	54	*76*	59	*321*	63
	SO	*43*	34	*37*	29	*59*	46	*52*	41	*191*	37

Figure 4: *Proportions of OS in Korean*

(a) accusative (b) dative



The generalized linear mixed-effects model reveals a significant effect of VERB CLASS in the accusative experiment reflecting the difference between OS frequencies with experiencer verbs ($n = 13$; 2.5%) and non-experiencer verbs ($n = 27$; 5.3%). However, although the proportions in Figure 4b suggest effects of both VERB CLASS and CONTEXT in the dative experiment, these effects do not reach statistical significance.

Table 10. *Model parameters: Korean experiments*

	fixed factor	estimate	$\chi^2(1)$	p
accusative	intercept	–2.32		
	VERB CLASS (experiencer)	–2.99	8.9	< .01
	CONTEXT (licensing)	–.49	.1	= .9
	VERB CLASS^CONTEXT	2.03	2.4	= .1
dative	intercept	.23		
	VERB CLASS (experiencer)	.82	3.3	= .1
	CONTEXT (licensing)	.22	.3	= .6
	VERB CLASS^CONTEXT	–.07	.1	= .9

In sum, the Korean results strongly deviate from the other languages. Korean lacks an effect of CONTEXT both for accusative and dative verbs. The overall low frequency of OS orders in the accusative data strongly differs from the results in the other languages. In the dative data, Korean is similar to Hungarian in not showing a VERB CLASS effect. Altogether, Korean takes a special position in our data in most respects.

7. Discussion

The results presented in Section 6 reveal cross-linguistic differences in the role of case as well as in the role of verb class. In both experimental studies, we used disharmonic animacy configurations, i.e., the baseline in our data may involve an effect of animacy on word order. However, the observed differences are informative for the influence of VERB CLASS and CONTEXT of each case – independently of animacy effects. In the accusative data, German and Hungarian display an effect of VERB CLASS, providing evidence for EXPERIENCERFIRST as formulated in (1). Moreover, German, Greek, and Hungarian show a significant main effect of CONTEXT, which reflects a TOPICFIRST effect that applies to the same constructions. The two effects are cumulated without significant interaction in German and Hungarian. There is no VERB CLASS effect in the Greek data; Korean has a different data pattern with very low frequencies of OS order and a VERB CLASS effect that challenges EXPERIENCERFIRST.

In the dative experiment we compared experiencer-objects with another class of datives, namely unintentional causers. This experiment generally reveals a high proportion of initial datives, confirming the assumption of DATIVEFIRST. Note that the difference between accusatives and datives is smaller in Hungarian. An effect of CONTEXT only appears in Hungarian; an effect of VERB CLASS is found in German and Greek, whereby the unintentional causers reached a higher proportion of dative-first than the experiencer datives in both languages. The confirmed effects are summarized in Table 11.

Table 11. *Confirmed effects*

	Accusative		dative	
	CONTEXT	VERB CLASS	CONTEXT	VERB CLASS
German	TOPFIRST	EXPFIRST	–	CAUSERFIRST
Greek	TOPFIRST	–	–	CAUSERFIRST
Hungarian	TOPFIRST	EXPFIRST	TOPFIRST	–
Korean	–	–EXPFIRST	–	–

The crucial question is where the observed differences between the languages come from. Do these phenomena directly reflect differences in syntactic structure or rather result from independent phenomena that influence the choice of constructions in discourse, e.g., the preference against ambiguity risks or the compensatory effects of alternative constructions for expressing the same content in a different linearization?

Starting with the accusative/dative contrast, our findings confirm the observations and intuitions that datives are more likely than accusatives to occur first in an utterance; previous data on such observations come primarily from studies on Germanic languages (German in Lenerz 1977; Hoberg 1981; Kempen and Harbusch 2003; Bader and Häussler 2010; Dutch in Lamers and de Schepper 2010). Our findings support this observation, including additional languages, which allows for conclusions about the related grammatical features that may explain this contrast. In particular, two differences between accusative and dative are visible in the presented data: (a) datives are chosen as first arguments more frequently than accusatives, whereby the differences between cases reveal the following scale: Korean (dative OS – accusative OS = 55%) > Greek

(38%) > German (34%) > Hungarian (8%); (b) the context has an effect in more languages in the accusative data (German, Greek, and Hungarian) than the dative data (only Hungarian).

Section 3 introduced three possible explanations for the differences between datives and accusatives with respect to the linearization. Explanations tracing the observed phenomena back to animacy asymmetries (Kempen and Harbusch 2003) can be rejected with our data, since animacy configurations were kept constant in both experiments. However, the conclusion is not that animacy does not play a role, but that the difference between accusatives and datives is not explained by animacy.

Another explanation traces the accusative/dative contrast back to the discriminability of case in the phonological form. The accusative/nominative contrast is rarely visible in German DPs, since it is restricted to personal pronouns and masculine/singular nouns. This does not hold for dative DPs, which always contrast with nominatives – at least by means of the determiner. The non-discriminability of morphological case implies an ambiguity risk, which may block deviations of the canonical order. This hypothesis predicts a difference along the scale German > Greek > Hungarian/Korean (see Table 1), which is not corroborated by our results.

A third account is based on the compensatory effects of alternative constructions for preposing the experiencer. Accusatives can be preposed through diathetic alternations, which are not available for datives (Lamers and de Schepper 2010). Many EO verbs have anticausative counterparts with a nominative experiencer in a higher position; see (15) and discussion in Section 3. The availability of alternative constructions introduces a difference between accusatives and datives that equally holds for all examined languages, i.e., this phenomenon correctly predicts the dative/accusative difference in all languages, but it does not account for the observed scale between languages. Assuming that the large effect of case in Korean (55%) is explained by a restriction only applying to EO accusative verbs, the unexpected fact is the difference between the large effect in German (34%)/Greek (38%) and the small effect in Hungarian (8%).

Let us now examine the potential effects of structural differences. It has been claimed that linearization preferences are not reliable indicators of phrase structure, since independent principles may lead to linearization preferences that do not directly reflect hierarchical structure (Müller 1999). In particular, assumptions about phrase structure should be primarily based on evidence for hierarchical relations, and this is not the type of data provided by the experiments under discussion. In the following, we refer to linearization statements about the order of cases (in the sense of Müller 1999). Though the relation between generalizations on case order and phrase structural accounts has been discussed, we refrain from using the findings on case order to draw conclusions about phrase structure.

Our data reveals a contrast between the order of accusative and dative DPs. In the absence of a contextual or thematic trigger, accusative DPs most frequently follow nominative DPs in all languages in our sample. On the other side, dative DPs preferably precede nominative DPs. This generalization is summarized in (24). The case order in (24a) corresponds to phrase structure accounts that analyze accusative EO verbs on a par with canonical transitive verbs (Sternefeld 1985; Grewendorf 1989; Fanselow 2000). Accounts assuming that accusative experiencers are located higher in the phrase structure than the nominative stimuli (e.g., Landau 2010) need additional assumptions in order to account for the accusative/dative contrast in the presented data, i.e., they need to assume that the linearization principles on case order are independent from phrase structure. The case order in (24b) must be restricted to a particular type of dative,

i.e. the dative of unaccusative predicates (which applies both to dative experiencers and unintentional causer datives). It does not apply to lexically selected datives (e.g., with verbs like *helfen* 'to help'), nor to the dative of indirect objects. The relation of the linearization statement in (24b) to the phrase structure is straightforward: datives with unaccusative verbs are higher than nominatives in the verb projection (see Schäfer 2009 for unintentional causes).

(24) Case order: Linearization principles
   a. < nominative ≻ accusative >
   b. < dative ≻ nominative > (with unaccusative verbs)

The accusative data reveal a major difference between Korean and the other languages. Korean has a freezing effect on word order when animacy is disharmonically mapped onto the theta-role hierarchy (see Section 2.2). This constraint blocks OS constructions independently of VERB CLASS and CONTEXT. Furthermore, the Korean results display an anti-EXPERIENCERFIRST effect. Assuming that freezing effects relate to the parsing difficulty of disharmonic animacy configurations, this effect suggests that the mismatch in EO verbs is conceived to be stronger than the mismatch with canonical verbs, such that preposing in the former group of verbs is selected even less frequently.

In the accusative data, the OS order is frequently chosen in German, Hungarian, and Greek. Furthermore, all three languages have a main effect of CONTEXT, showing that the same construction that appears with fronted experiencers can be triggered by contexts inducing topicalization. However, German and Hungarian differ from Greek in that these two languages display an additional effect of VERB CLASS (Table 11). The question is which typological feature accounts for this difference. Crucial are the properties of the syntactic operation underlying OS orders in these languages. Preposing an object in German involves scrambling the object over the subject, which is reported to be triggered by several preferences on linearization such as case, animacy, etc.; the topic position in Hungarian is a position that must be filled with stative predicates if no narrow focus is available (see Section 2.2). In contrast to these languages, clitic left-dislocation in Greek is a construction hosting contrastive topics or establishing links to the common ground and not a construction that is used to establish aboutness relations.

The critical issue is how speakers select linearizations in all-new contexts. We assume that the results reflect preferences in establishing aboutness relations with particular types of arguments; see (3). The intuition that is reflected in speakers' choices is that it is more likely to make a statement about an experiencer than about the patient of a canonical verb. This preference is reflected in object-fronting constructions that can host aboutness topics. This is the case for scrambled objects in German and objects in the topic position in Hungarian. Clitic left-dislocation in Greek is not such a construction; hence the fact that CLLD is not selected in order to establish an aboutness relation is not a surprising effect. The observed difference in the Greek data does not confirm the intuition that clitic left dislocation with Greek EO verbs occurs without a contextual trigger (as reported in Anagnostopoulou 1999). The external validity of our finding is corroborated by observations in speech production. In a production study with Greek experiencer-verbs, speakers produced experiencer-first expressions in 39% of the cases with inanimates and 23% with animates: in all experiencer-first expressions, Greek speakers selected mediopassive verbs with an experiencer subject and never produced an ACC-NOM order (Verhoeven 2014). The conclusion is that clitic left-dislocation is

not the type of construction that speakers use in order to express aboutness with respect to the accusative argument, even in the case of experiencers. Our account is summarized in (25).

(25) < aboutness-topic ≻ comment >
applying to:
– scrambling objects over subjects;
– topicalizing objects in languages in which the topic position must be filled;

Turning to the results of the dative experiment, the large difference between datives and accusatives directly reflects the view that dative EO verbs are unaccusatives, involving a dative experiencer in a higher position than the governed nominative; see (26a). The same holds for unintentional causers which occupy the specifier position of applicative phrases (ApplP), taking a higher position than the theme in the clause structure; see (26b).

(26) Dative-nominative
a. [VP experiencerDAT [V′ stimulusNOM V]]
b. [ApplP causer [VP theme V]]

The assumptions in (26b) accounts for the contrast between accusative and dative experiencers in Korean. Since dative experiencers are higher than the nominatives, the configuration 'animate dative (higher argument) and inanimate nominative (lower argument)' is not an instance of disharmonic mapping of animacy with the thematic role hierarchy; hence, the freezing effects do not apply. The effect of case in Hungarian (8% more experiencer-fronting with datives) is smaller than the corresponding effects in the other languages (above 30%). The property that sets Hungarian apart from the other languages in this study is that there is no syntactic evidence that dative arguments crucially differ from accusative arguments in this language, in particular dative experiencers do not show quirky subject properties (see Section 3). This is in line with the analysis that dative experiencers are governed VP-arguments in Hungarian, i.e., dative experiencer verbs are not unaccusatives.[7] In this view, the reported results reveal two differences between governed experiencer objects (accusative experiencers in all languages and dative experiencers in Hungarian) and experiencer datives with unaccusative verbs (dative experiencers in German, Greek, and Korean):

(27) If the dative experiencer is the higher argument of an unaccusative verb, then
(a) it is more likely than the accusative experiencer to appear early in the linearization (since we cannot compare across experiments, we refer to this difference as a descriptive effect in our data)
(b) the linearization preferences are not affected by contexts topicalizing the dative argument (this generalization is based on the absence of an effect of CONTEXT in the Greek/German/Korean dative data).

In our experimental study, we used a particular kind of contextual licensing that affected object-topicalization (see Section 5.1). In particular, the contexts involved a set-member relationship between an argument in the target clause and a salient antecedent in discourse. Our findings enrich the knowledge about the contextual conditions that induce object-fronting (see previous findings on whole-part relations in Weskott et

al. 2011). The comparison to experiencer-fronting reveals that partial topics trigger the fronting of a lower argument in a superset of the syntactic constructions that allow for fronting aboutness-topics; compare with (25).

(28) < partial-topic ≻ comment >
applying to:
– scrambling objects over subjects;
– topicalizing objects in languages in which the topic position must be filled;
– clitic left dislocation.

Finally, our findings in the dative experiments also contain a main effect of VERB CLASS in German and Greek, such that unintentional causers appear more frequently first in the clause than dative experiencers; see CAUSERFIRST in Table 11. This difference cannot be explained through structural properties, since both types of datives are higher arguments with unaccusative verbs. A possible explanation is that a discourse asymmetry is again at issue: statements about unintentional causers are judged as being more likely than statements about experiencers. However, further research is needed in order to examine this possibility. The difference to Hungarian comes as a surprise under this explanation, given that the unintentional causer should be a higher adjunct in this language, too. However, the difference to Korean has a syntactic explanation: the translational equivalent of the unintentional causer constructions involves a dative complement of verbs implying motion in this language; see (19c), which can explain the less pronounced tendency for its early realization in comparison to dative experiencers.

8. Summary

The aim of the present study was to collect precise estimates of EXPERIENCERFIRST effects across languages and to account for the source of cross-linguistic differences in this domain. We conducted forced-choice experiments examining the impact of verb class and context on the fronting of dative/accusative constituents in four languages: German, Greek, Hungarian, and Korean. The obtained data revealed substantial differences between languages, demanding a typological explanation.

We observed a large difference between dative and accusative experiencers, such that the preference for EXPERIENCERFIRST is stronger in the former case than in the latter. We further concluded from the properties of the investigated languages that performance principles relating to the avoidance of ambiguity risks or the compensatory effects of alternative constructions cannot explain the complete data pattern. By taking into account that datives are higher arguments of unaccusative verbs in some languages, we can explain the typological pattern; these languages in particular (German, Greek, and Korean in our sample) show a large difference between datives and accusatives in the linearization preferences.

The constructions that were used to front experiencer arguments were also shown to be sensitive to contexts that topicalize lower arguments. This applies to accusative experiencers in Greek/German and all non-nominative experiencers in Hungarian. An additive effect of CONTEXT did not appear in configurations in which the experiencer is a higher argument. This finding is in line with the hypothesis stating that the EXPERIENCERFIRST effects result at least to some extent from the discourse preference to topicalize experiencers – without any syntactic assumptions about their position in the hierarchical structure. The typological variation in the presence of

EXPERIENCERFIRST effects further supports this view: we found such effects in scrambling (German) as well as in topicalization in a language in which the topic position must be filled (Hungarian), i.e., in structural configurations that may host aboutness topics in general. We did not find such effects in Clitic Left Dislocation, a construction that requires a stronger contextual trigger than aboutness (i.e., contrastive topicalization).

This study contributes to the research on experiencer-object verbs presenting replicable cross-linguistic data collected under identical conditions in the individual languages. In the four examined languages, we found essential typological differences hitherto unexplored, which cannot be easily captured through singular intuitions. Furthermore, we were able to draw conclusions about the sources of particular phenomena by taking the grammatical properties of the investigated languages into account. We close this study by observing that cross-linguistic experiments are a promising paradigm bearing advancements in our knowledge about grammatical phenomena.

Notes

[1] Here and throughout the article, the labels SO and OS for the two basic word order alternatives are chosen based on the traditional understanding of the notion subject (S) as the nominative argument, which is not a claim about the syntactic status of non-nominative experiencers.

[2] For the transliteration of the Korean examples, we use the Yale romanization.

[3] Note that this observation is an instance of the constraints blocking deviations from the basic word order mentioned in Section 2.2.

[4] This observation is related to the assumption of a flat VP structure containing both the experiencer and the stimulus argument (É. Kiss 2003; Rákosi 2006). See É. Kiss (2008) for a discussion of arguments for a flat vs. a hierarchical VP structure.

[5] OnExp is developed at the Courant Research Center *Text Structures* at Georg-August University Göttingen. Our studies were implemented in versions 1.2 and 1.3; Copyright © Edgar Onea, 2011. http://onexp.textstrukturen.uni-goettingen.de.

[6] Topic-marking of the dative constituent introduces an ambiguity between the dative-nominative and the double nominative construction; see (10c). Topic-marked preposed animate objects occurring with nominative-marked inanimate subjects are judged as non-acceptable in Korean (see example (11)). Note furthermore that in Korean (as in German), scrambling of case-marked objects into sentence-initial position functions as information structural reordering. Depending on prosodic properties, either a topic-comment structure or a contrastive focus reading of the preposed constituent is a possible option, the former being tied to a neutral intonation (see Choi 1996).

[7] This characterization conforms with one class of dative experiencers analyzed in Rákosí 2006 as so-called thematic adjuncts of unergative verbs, as e.g., *megfelel* ‘be suitable’; verbs from this class have been mainly used in our experiment (see Appendix A, Table C). A further class of experiencer arguments (with verbs as *tetszik* ‘appeal to’) possess an unaccusative thematic structure in this analysis, which is, however, not reflected configurationally, as Rákosi assumes a flat VP. In any case, as mentioned before, neither of these experiencer datives shows quirky subject properties.

Abbreviations

ACC – accusative, ADV – adverbial, AOR – aorist, DAT – dative, DECL – declarative, GEN – genitive, GER – gerund, LOC – locative, M – masculine, NOM – nominative,

PASS – passive, PERF – perfect, PL – plural, PST – past, PTCL – particle, PTCP – participle, SG – singular, TOP – topic

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Appendix A. Verb lists

A. German

	accusative		dative	
	experiencer	non-experiencer	experiencer	non-experiencer
1	*plagen* 'annoy'	*behindern* 'hinder'	*schwerfallen* 'be difficult'	*verloren gehen* 'become lost'
2	*erstaunen* 'astonish'	*schützen* 'protect'	*wehtun* 'hurt'	*auskippen* 'tip'
3	*entmutigen* 'discourage'	*verändern* 'change'	*leidtun* 'feel sorry'	*einlaufen* 'shrink'
4	*begeistern* 'enthuse'	*heilen* 'heal'	*schmecken* 'have a taste'	*anbrennen* 'scorch'
5	*verängstigen* 'frighten'	*wecken* 'wake up'	*nahegehen* 'affect'	*abbrechen* 'break'
6	*interessieren* 'interest'	*abholen* 'pick up'	*leichtfallen* 'be easy'	*volllaufen* 'swamp'
7	*erfreuen* 'delight'	*retten* 'rescue'	*entfallen* 'slip the mind'	*auslaufen* 'leak/run out'
8	*langweilen* 'bore'	*zerstören* 'destroy'	*zusagen* 'appeal'	*ausgehen* 'run out'
9	*anwidern* 'disgust'	*vergiften* 'poison'	*missfallen* 'dissatisfy'	*runterfallen* 'fall down'
10	*entzücken* 'rapture'	*verbessern* 'improve'	*vergehen* 'put off'	*kaputtgehen* 'get broken'
11	*frustrieren* 'frustrate'	*verletzen* 'injure'	*auffallen* 'attract attention'	*zerreißen* 'rupture'

12	*wundern* ‘wonder’	*warnen* ‘warn’	*einfallen* ‘spring to mind’	*umkippen* ‘tip over’
13	*beunruhigen* ‘worry’	*blenden* ‘bedazzle’	*gefallen* ‘appeal’	*verschimmeln* ‘get moldy’
14	*erschrecken* ‘scare’	*infizieren* ‘infect’	*einleuchten* ‘make sense’	*überlaufen* ‘flood’
15	*aufregen* ‘upset’	*aufhalten* ‘hold back’	*entgehen* ‘fail to notice’	*zerbrechen* ‘break’
16	*enttäuschen* ‘disappoint’	*blamieren* ‘disgrace’	*fehlen* ‘miss’	*abbrennen* ‘burn away’

B. Greek

	Accusative		dative	
	experiencer	non-experiencer	experiencer	non-experiencer
1	εκνευρίζω *eknevrízo* ‘upset’	προειδοποιώ *proidopio* ‘warn’	χεφεύγω *ksefévγo* ‘slip the mind’	υπερχειλίζω *iperχilízo* ‘overflow’
2	ενδιαφέρω *enđiaféro* ‘interest’	βοηθάω *voiθáo* ‘helfen’	βρομάω *vromáo* ‘have a unpleasant smell’	πέφτω *péfto* ‘fall down’
3	χαροποιώ *χaropió* ‘delight’	καταστρέφω *katastréfo* ‘destroy’	μου φαίνεται εύκολο *mu fénete évkolo* ‘be easy’	κόβω *kóvo* ‘clod’
4	καταρρακώνω *katarakóno* ‘discourage’	δηλητηριάζω *dilitiriázo* ‘poison’	διαφεύγω *diafévγo* ‘fail to notice’	χύνομαι *χínome* ‘tip over’
5	στενοχωρώ *stenoχoró* ‘sadden’	ξυπνάω *ksipnáo* ‘wake up’	μου πέφτει βαρύς *mu péfti varís* ‘be difficult’	πλημμυρίζω *plimirízo* ‘swamp’
6	προβληματίζω *provlimtízo* ‘worry’	εμποδίζω *embodízo* ‘hinder’	μου φαίνεται ικανοποιητικό *mu fénete ikanopiitikó* ‘satisfy’	μπλοκάρω *blokáro* ‘block’
7	ενθουσιάζω *enθusiázo* ‘inspire’	καθυστερώ *kaθisteró* ‘delay’	κολλάω *koláo* ‘stuck in mind’	χαλάω *χaláo* ‘break’
8	ενοχλώ *enoχló* ‘annoy, bother’	τυφλώνω *tiflóno* ‘bedazzle’	μου φαίνεται άνοστο *mu fénete ánosto* ‘have a bland taste’	καταστρέφω *katastréfo* ‘get broken’
9	ταράζω *tarázo* ‘stir up, upset’	προστατεύω *prostatevo* ‘protect’	λείπω *lípo* ‘miss’	μουχλιάζω *muχliázo* ‘get moldy’
10	κουράζω *kurázo* ‘bore’	βελτιώνω *veltióno* ‘improve’	μου φαίνεται αηδιαστικό *mu fénete aiđiastikó* ‘disgust’	τελειώνω *telióno* ‘run out’
11	σοκάρω *sokáro* ‘shock’	τρυπάω *tripáo* ‘pierce’	στοιχίζω *stiχízo* ‘cost emotionally’	καίγομαι *kégome* ‘burn’

12	απογοητεύω *apogoitevo* 'disappoint'	παραλαμβάνω *paralamváno* 'pick up'	μου κακοφαίνεται *mu kakofénete* 'dissatisfy'	σκίζομαι *skízome* 'tear'
13	αηδιάζω *aiðiázo* 'disgust'	αποκοιμίζω *apokimízo* 'drowse'	μου φαίνεται βαρύς *mu fénete barís* 'be too heavy'	λιώνω *lióno* 'melt'
14	τρομάζω *tromázo* 'frighten'	σώζω *sózo* 'rescue'	μου αρέσει *mu arési* 'appeal'	στραβώνω *stravóno* 'bend'
15	ενθουσιάζω *enθusiázo* 'enthuse'	εξαντλώ eksantló 'exhaust'	κόβομαι *kóvome* 'be put off'	κολλάω *koláo* 'get stuck (key)'
16	ενθουσιάζω *enθusiázo* 'ravish'	καταστρέφω *katastréfo* 'ruin'	μου φαίνεται συγκινητικός *mu fénete siginitikós* 'affect'	σπάω spáo 'break'

C. Hungarian

	accusative		dative	
	experiencer	non-experiencer	experiencer	non-experiencer
1	*vonz* ‘attract’	*akadályoz* ‘hinder’	*jelent* ‘mean sth.’	*besárgul* ‘become yellow’
2	*bánt (lelkileg)* ‘trouble’	*elvakít* ‘bedazzle’	*szembeötlik* ‘stand out’	*kinyílik* ‘open’
3	*elcsüggeszt* ‘discourage’	*meggyógyít* ‘heal’	*ízlik* ‘taste’	*begurul vhova* ‘roll in easy (ball)’
4	*érdekel* ‘interest’	*lejárat* ‘disgrace’	*hiányzik* ‘miss’	*beindul* ‘start (car)’
5	*izgat* ‘excite’	*tönkretesz* ‘destroy’	*nehezére esik* ‘be difficult’	*kifakul* ‘bleach out’
6	*nyomaszt* ‘distress’	*figyelmeztet* ‘warn’	*derogál* ‘derogate’	*kijön* (*számolásnál*) ‘result (counting)’
7	*bosszant* ‘annoy’	*felkelt* ‘wake up’	*beválik* ‘work well’	*meggyullad* ‘ignite’
8	*meglep* ‘surprise’	*megmérgez* ‘poison’	*könnyen megy* ‘be easy’	*felolvad* ‘unfreeze’
9	*megvisel* ‘make sb. feel low’	*megvéd* ‘protect’	*túl sokáig tart* ‘take too long’	*bezáródik* ‘lock’
10	*elszomorít* ‘sadden’	*megerősít* ‘strengthen’	*jót tesz* ‘do sth. good’	*bekapcsol* ‘turn on’
11	*lelkesít* ‘enthuse’	*megfertőz* ‘infect’	*beugrik* ‘come to mind’	*sikerül* ‘succeed’
12	*untat* ‘bore’	*elhoz* ‘pick up’	*megfelel* ‘be suitable’	*megjavul* ‘get repaired’
13	*lehangol* ‘depress’	*feltart* ‘hold back’	*megtetszik* ‚appeal to’	*összeáll* ‘stand to reason’
14	*nyugtalanít* ‘worry’	*megsebesít* ‘injure’	*fájdalmat* okoz ‘hurt’	*becsukódik* ‘close’
15	*kínoz* ‘pester, torture’	*megváltoztat* ‘change’	*leesik* ‘fall down’	*megfő* ‘cook’
16	*megfélemlít* ‘frighten’	*megment* ‘save’	*feltűnik* ‘appear, attract attention’	*megkel* ‘let the dough prove’

D. Korean

	accusative		dative	
	experiencer	non-experiencer	experiencer	non-experiencer
1	귀찮게 하다 *kwichanhkey hata* ‘annoy’	방해하다 *panghayhata* ‘disrupt’	힘겹다 *himkyepta* ‘be too much’	날아오다 *nalaota* ‘come flying’
2	기쁘게 하다 *kippukey hata* ‘delight’	구원하다 *kwuwenhata* ‘rescue’	부담스럽다 *pwutamsulepta* ‘distress’	들어오다 *tuleota* ‘come in, get in’
3	맥빠지게 하다 *maykppacikey hata* ‘discourage’	부상시키다 *pwusangsikhita* ‘injure’	후회하다 *hwuhoyhata* ‘feel sorry’	떨어지다 *ttelecita* ‘fall’

4	만족스럽게 하다 *mancoksulepkey hata* 'satisfy'	살려내다 *sallyenayta* 'reanimate'	만족스럽다 *mancoksulepta* 'be satisfactory'	오다 *ota* 'come'
5	두렵게하다 *twulyepkey hata* 'frighten'	깨우다 *kkaywuta* 'wake up'	필요하다 *philyohata* 'need'	달려오다 *tallyeota* 'come up to'
6	흥미있게 하다 *hungmiisskey hata* 'interest'	실어가다 *silekata* 'pick up'	쉽다 *swipta* 'be easy'	마주오다 *macwuota* 'come up to'
7	흐뭇하게 하다 *humwushakey hata* 'please'	살려주다 *sallyecwuta* 'go easy on'	부럽다 *pwulepta* 'envy'	쏟아지다 *ssotacita* 'slop'
8	지루하게 하다 *cilwuhakey hata* 'bore'	망쳐놓다 *mangchyenohta* 'ruin'	두렵다 *twulyepta* 'be afraid'	스치다 *suchita* 'touch'
9	메스껍게 하다 *meysukkepkey hata* 'disgust, sicken'	중독시키다 *cwungtoksikhita* 'poison'	불쾌하다 *pwulkhwayhata* 'be obnoxious'	다가오다 *takaota* 'draw near'
10	싫증나게 하다 *silcungnakey hata* 'disgust'	성장시키다 *sengcangsikhita* 'let grow'	맛있다 *masissta* 'taste'	묻다 *mwutta* 'cover with dirt'
11	화나게 하다 *hwanakey hata* 'anger'	다치게 하다 *tachikey hata* 'injure'	발견되다 *palkyentoyta* 'be apparent, visible'	부딛히다 *pwutithita* 'push/hustle'
12	소름끼치게 하다 *solumkkichikey hata* 'appall'	정신차리게 하다 *cengsinchalikey hata* 'warn'	떠오르다 *tteoluta* 'come to mind'	튀다 *thwita* 'bounce, splatter'
13	당황하게 하다 *tanghoanghakey hata* 'embarrass'	눈부시게 하다 *nwunpwusikey hata* 'dazzle'	좋다 *cohta* 'be good'	지급되다 *cikuptoyta* 'be paid'
14	불안하게 하다 *pwulanhakey hata* 'unsettle'	감염시키다 *kamyemsikhita* 'infect'	떠오르다 *tteoluta* 'come to mind'	휘감기다 *hwikamkita* 'twist away'
15	격분하게 하다 *kyekpwunhakey hata* 'outrage'	지체시키다 *cicheysikhita* 'retard'	지루하다 *cilwuhata* 'be boring'	걸리다 *kellita* 'hang'
16	부끄럽게 하다 *pwukkulepkey hata* 'shame'	기죽이다 *kicwukita* 'daunt'	그립다 *kulipta* 'miss'	닥쳐오다 *takchyeota* 'come around'