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3

## 4 Verb class, case, and order.

5 A cross-linguistic experiment on non-nominative experiencers

6

### 7 **Abstract**

8 It has been shown for several languages that non-nominative experiencers tend to ap-  
9 pear early on in the utterance, frequently triggering deviations from the preferred  
10 word order. These observations are based on linearization preferences, which in most  
11 cases involve gradient levels that cannot be determined precisely through singular  
12 intuitions. This article presents a cross-linguistic experimental study on languages  
13 with different word order properties (German, Greek, Hungarian, and Korean) in or-  
14 der to offer precise estimates for the effects of experiencer objects on linearization.  
15 The findings reveal a large effect of case in the sense that dative experiencers more  
16 frequently appear first in an utterance than accusative experiencers. Based on the spe-  
17 cific properties of the investigated languages, we revise previous hypotheses about the  
18 source of the dative/accusative asymmetry and conclude that the asymmetry relates to  
19 phrase-structural differences. Accusative experiencers are fronted more frequently  
20 than patients of canonical transitive verbs. We argue that this phenomenon relates to a  
21 preference for selecting experiencers as aboutness topics, which explains the fact that  
22 *experiencer-first* appears in syntactic constructions that may be triggered by

1 aboutness. The results show that the experiencer-first principle interacts with proper-  
2 ties of syntactic structure, thus resulting in differences between languages that can be  
3 traced back to the basic properties of syntactic typology.

4 **Keywords**

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

## 1 **1. Introduction**

2 A central issue in the research on argument structure is the status of particular classes  
3 of verbs whose thematic properties deviate from the default transitive configuration  
4 involving an agent subject and a patient object. Psychological verbs, as for instance *x*  
5 *concerns y*, *x annoys y*, play a prominent role in this field of research since they show  
6 structural properties that deviate from the patterns established for canonical verbs  
7 (Arad 1998; Belletti and Rizzi 1988; Pesetsky 1987; Postal 1971). These predicates  
8 license two theta roles: an experiencer, which refers to an animate individual affected  
9 by an internal (psychological) event, and a stimulus, which refers to an (animate or  
10 inanimate) individual which triggers this event or is this event's subject matter. Of  
11 particular interest among the psych-verbs are those which encode the experiencer in a  
12 typical objective case (generally dative or accusative), henceforth called experiencer-  
13 object (EO) verbs. Researchers have shown for many languages that experiencer ob-  
14 jects display properties that are unexpected for canonical objects (also termed 'psych  
15 properties'), relating to their behavior in several syntactic phenomena, e.g. nominali-  
16 zation, reflexivization, passivization, extraction, binding, and argument linearization  
17 (Belletti and Rizzi 1988; Pesetsky 1995; Bayer 2004; Fanselow 2000; Grewendorf  
18 1989; Haspelmath 2001; Klein and Kutscher 2002; Landau 2010). These properties  
19 are sometimes recognized as evidence for the subject status of the experiencer. Putting  
20 the controversy about the subject/non-subject issue aside, the crucial question is  
21 whether these phenomena reflect a constituent structure in which the non-nominative  
22 constituent (experiencer) takes a higher argument position than the nominative con-  
23 stituent (stimulus) (see further discussion in Section 2).

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

14 Generalizations about the word order of EO verbs are mainly based on intuitions  
15 about the well-formedness of alternative linearizations. Since these phenomena are  
16 influenced by several factors (e.g., animacy, contextual licensors, etc.) and involve  
17 gradience (see, e.g., the observations of the difference between dative and accusative  
18 experiencers), singular intuitions are not sufficiently precise in order to estimate the  
19 exact properties of the phenomenon at issue. At the same time, the origin of judg-  
20 ments of the type ‘the  $xy$  order is more/less acceptable than the  $yx$  order’ is unclear:  
21 are such statements based on the number of contexts that a given order occurs in, i.e.  
22 does a wider range of suitable contexts increase acceptability, or is it the absolute fre-  
23 quency of a licensing context in discourse for a given order that determines its accept-  
24 ability? Furthermore, the available data across languages are not reliable for cross-

1 linguistic comparisons since the extent to which the differences between languages  
2 are influenced by the bias of different observers cannot be assessed. For this reason,  
3 we carried out a cross-linguistic experimental study in order to examine the effects of  
4 experiencer-fronting phenomena across languages. Using the data, we compare two  
5 OV (German, Korean) and two VO languages (Greek, Hungarian) that display several  
6 differences in word order properties as well as in the properties of experiencer-object  
7 constructions. With a parallel experimental design, we examine the basic dimensions  
8 of the linearization properties of EO verbs: (a) we compare experiencer arguments to  
9 other constituents that are syntactically similar in order to identify the particular prop-  
10 erties of EO verbs; (b) we compare the role of accusative and dative experiencers; (c)  
11 we compare the effects of experiencer objects with the effects of context on lineariza-  
12 tion (see details in Section 5). Our aim is to identify cross-linguistic differences and  
13 draw conclusions about their relation to grammatical properties that exist inde-  
14 pendently of experiencer objects, e.g., the word order properties of the languages at  
15 issue.

16 The results of this study show that the preference for experiencer-first linearization  
17 is not identical across languages (Section 6). Our claim is that the essential properties  
18 of the cross-linguistic variation can be understood if we examine the structural proper-  
19 ties of word order for the individual languages (Section 7).

## 20 **2. Experiencers and linearization**

1 **2.1. Phenomena and accounts**

2 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  
3 clause without a contextual trigger. This exceptional behavior appears in particular  
4 with a subset of EO verbs, namely non-agentive EO verbs such as *concern* or *fascinate*  
5 in which the subject does not exercise control over the event (Arad 1998; Klein  
6 and Kutscher 2002; Reinhart 2002; Landau 2010; Scheepers 1997). The particular  
7 role of experiencers in linearization was first reported on the basis of intuition data  
8 (Lenerz 1977 for German; Belletti and Rizzi 1988 for Italian; Anagnostopoulou 1999  
9 for Greek). Furthermore, production studies both with naturalistic and with experi-  
10 mental data, confirm a linearization asymmetry that depends on the theta-role of the  
11 object (Ferreira 1994 for English; Ichihashi-Nakayama 1994 for Nepali; Author 2014  
12 for German). Linearization preferences are also reflected in speech comprehension  
13 (Scheepers 1997; Scheepers et al. 2000; Haupt et al. 2008 for German). The phenom-  
14 enon at issue is summarized in (1).

16

17 (1) EXPERIENCERFIRST

18 An experiencer object is more likely than a patient object to occur early in the  
19 linearization.

20

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

1       Syntax-based accounts assume that the linearization properties of experiencers re-  
2       flect their properties in a hierarchical syntactic structure. Different theta-roles are  
3       hosted by different structural projections, as schematically presented in (2). Following  
4       current assumptions, the patient is an internal argument of the VP, while the agent is  
5       hosted by a higher verbal projection, presumably the vP in (2a). The constituent struc-  
6       ture of (at least) a subset of EO verbs involves a non-agentive stimulus as verbal com-  
7       plement and an experiencer in a higher position. The stimulus is hosted by the same  
8       projection as a patient. The bracketing in (2b) is common to older and recent accounts  
9       (e.g., Belletti and Rizzi 1988, Landau 2010), whereas otherwise these accounts differ  
10       with respect to the labeling of the experiencer projection. The conflict between (2a)  
11       and (2b) arises in case marking, since the higher argument is a nominative argument  
12       in (2a) and a non-nominative argument in (2b). This difference arises from the as-  
13       sumption that the experiencer bears an inherent case, i.e., a case that is not determined  
14       by the structural configuration (Landau 2010).

15

- 16       (2)   a.   [<sub>VP</sub> agent [<sub>VP</sub> patient V ] ]  
17            b.   [<sub>VP</sub> experiencer [<sub>V'</sub> stimulus V ] ]

18

19       The crucial issue for our considerations is the bracketing (and not the labeling) in  
20       (2b), i.e., the statement that the experiencer is hosted by a higher position than the  
21       stimulus. The evidence for this statement is provided by phenomena relating to the  
22       hierarchical structure, most importantly from binding facts. Experiencers of non-  
23       agentive EO verbs have been argued to bind stimuli, a property that is taken as evi-  
24       dence for a c-command relation between the binder and the bindee (Postal 1971; Bel-  
25       letti and Rizzi 1988; Pesetsky 1987, 1995; Reinhart 2002). Furthermore, non-agentive

1 EO verbs do not allow for canonical passivization (Belletti and Rizzi 1988; Grimshaw  
2 1990; Landau 2010). Experiencer objects are argued to be extraction islands in con-  
3 trast to canonical direct objects (Belletti and Rizzi 1988). All these properties (so  
4 called ‘psych properties’) create a contrast between the experiential domain and the  
5 non-experiential domain (cf. Landau 2010).

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

13 The notion of ‘topic’ that applies to these cases is the notion of aboutness topic: the  
14 intuition is that experiential predicates may be used as statements about the experienc-  
15 ing individual without contextual requirements (i.e., in all-new contexts), whereas  
16 such utterances are less likely to occur for patients of canonical verbs. This idea moti-  
17 vates the prediction in (3) that opens an interesting empirical question for typological  
18 research.

19

20 (3) Experiencers and aboutness

21 If experiencer-fronting is triggered by aboutness, then it is expected to occur in  
22 constructions that are used for aboutness topics.



1 **2.2. Word order in the languages under investigation**

2 All examined languages have flexible word order that is sensitive to information  
3 structure. Greek and Hungarian are VO languages (both analyzed as basic VSO; see  
4 É. Kiss 1998 for Hungarian; Philippaki-Warbuton 1982 and Alexiadou and Anagnos-  
5 topoulou 2001 for Greek). Both languages have a left-peripheral topic position that  
6 can be morphologically distinguished from the focus position (see É. Kiss 1998 for  
7 Hungarian; Alexiadou and Anagnostopoulou 2000 for Greek). In both languages, sub-  
8 jects of transitive verbs are very likely to appear in this position – even when lacking  
9 a contextual trigger, which results in the SVO order being the most frequent order in  
10 discourse (see Lascaratou 1989 for Greek and Behrens 1982 for Hungarian). The fre-  
11 quency of preverbal subjects in these languages does not imply an argument position  
12 in the left periphery. It results from a preference for filling the preverbal domain in  
13 general, except if the utterance comes with an event-focus realization. É. Kiss (2003:  
14 40) observes for Hungarian that the topic position must be filled with an aboutness  
15 topic in stative sentences without a preverbal focus or quantifier. Accounts on Greek  
16 word order assume the existence of structural rules that force the preposing of subjects  
17 out of the V-initial structure (Alexiadou and Anagnostopoulou 2001; Spyropoulos and  
18 Revithiadou 2007).

19 Although the preference for preverbal subjects may be similar in both languages, it  
20 is not accidental that analyses based on Hungarian data refer to ‘aboutness topics’ and  
21 corresponding analyses for Greek refer to ‘topical subjects’. The topic position in  
22 Hungarian can host any argument that is specific and referential (É. Kiss 2003: 36-  
23 40). In Greek, topical non-nominative arguments are topicalized in a particular con-  
24 struction, namely clitic left dislocation (henceforth CLLD), which involves a corefer-

1 ential clitic replicating the topic (Tsimplici 1995; Alexiadou and Anagnostopoulou  
2 2000). Clitic left dislocation is used for contrastive topics or topics serving as links to  
3 the Common Ground (Alexopoulou and Kolliakou 2002; Skopeteas and Fanselow  
4 2009) or hanging topics (see Anagnostopoulou 1997; Grohmann 2003), but not for  
5 aboutness topics. This creates a subject/object asymmetry with respect to the possible  
6 triggers of topic fronting in Greek that does not apply for Hungarian.

7 German and Korean are basic OV languages. Both languages allow for scrambling  
8 objects over the subjects (for German see Fanselow 2003; Müller 2004; Frey 2004,  
9 2005; for Korean see Frank et al. 1996; see also corpus findings in Bader and  
10 Häussler 2010 for German). Scrambling can be triggered by interaction of several  
11 factors, including definiteness, animacy, focus, etc. (Müller 2004). A particular prop-  
12 erty of Korean syntax is a set of constraints blocking deviations from the basic word  
13 order known as ‘freezing effects’. Loss of word order freedom is observed in struc-  
14 tures in which the morphological case is not visible or where a disharmonic mapping  
15 between animacy and thematic role hierarchy hinders the parsing of argument struc-  
16 ture (Lee, H. 2001; Lee, E. 2007). German main declarative clauses have an obligato-  
17 ry rule for fronting finite verbs to a higher clausal position (Thiersch 1978; Den  
18 Besten 1989). The prefield of verb-second clauses is obligatorily filled, which induces  
19 formal movement of the first eligible element in the middlefield (see Frey 2006). Re-  
20 turning to the relevant issue for our considerations, the potential for OS order in  
21 scrambling languages like German and Korean is not reserved to a particular type of  
22 topics and may thus also apply to aboutness topics.

23 Concluding, the word order facts presented in this section indicate that there are  
24 two types of languages with respect to the discourse conditions that may trigger front-  
25 ing of a lower argument. In scrambling languages (German and Korean) as well as in

1 Hungarian, aboutness can trigger object fronting in the clause structure. Greek differs  
2 from these languages in that fronting an object to the topic position is an instance of  
3 clitic left dislocation that requires a stronger contextual trigger than aboutness (e.g.,  
4 contrastive topicalization). This typological difference is relevant for the question of  
5 the origin of EXPERIENCERFIRST effects. If EXPERIENCERFIRST purely refers to the  
6 hierarchical clause structure, then we would not expect to find fronting of experi-  
7 encers to positions designated for information structure, e.g., fronting to topic posi-  
8 tions in Greek and Hungarian. If EXPERIENCERFIRST relates to the aboutness of expe-  
9 riencer arguments, then its effects would be expected to appear in German/Korean  
10 scrambling and Hungarian topicalization, but not in Greek clitic left dislocation.

### 11 **2.3. Experiencers in the languages under investigation**

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

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

1

2 (4) Hungarian

3 *János-t zavarja a zaj.*

4 John-ACC disturbs the noise

5 ‘John is disturbed by the noise.’ (É. Kiss 2005: 149)

6

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

16

17 (5) Greek

18 *ton daskalo ton endiaferi*

19 the.ACC.SG.M teacher:ACC.SG.M 3.SG.ACC.M interest:3.SG

20 *o mathitis.*

21 the.NOM.SG.M pupil:NOM.SG.M

22 ‘The teacher is interested in the pupil.’

23

24 The exceptional properties of experiencers occur with non-agentive stative EO  
25 verbs, but not with agentive (readings of the respective) EO verbs. Given that agentiv-

1 ity is a property of the verbal lexicon and as such subject to cross-linguistic variation,  
 2 the contrast between agentive and non-agentive EO verbs does not necessarily appear  
 3 in the verbal lexicon of all languages. For German, Greek, and Hungarian, two sub-  
 4 classes of transitive EO verbs depending on agentivity have been identified (e.g.,  
 5 Scheepers 1997; Verhoeven 2010 for German; Anagnostopoulou 1999; Kordoni 1999;  
 6 Author 2010 for Greek; Rákosi 2006 for Hungarian). Some accusative EO verbs in  
 7 these languages only allow a non-agentive reading, e.g., German *interessieren* ‘inter-  
 8 est’, *wundern* ‘wonder’; Greek *endiaféri* ‘interest’, *provlimatízo* ‘puzzle’; Hungarian  
 9 *érdekel* ‘interest’, *aggaszt* ‘worry, concern’. Other accusative EO verbs are ambiguous  
 10 between an agentive and a non-agentive reading. Whether these readings are possible  
 11 depends on the animacy of the stimulus: agentive readings are only possible if the  
 12 stimulus is an animate conscious entity that can exercise control over the event. This  
 13 is exemplified for German in (6a) vs. (6b): The sentence in (6a) is ambiguous between  
 14 a non-agentive reading (e.g., ‘something about the pupil bothers the teacher’) and an  
 15 agentive reading (e.g., ‘the pupil [intentionally] bothers the teacher’), whereas the  
 16 same structure with an inanimate stimulus only allows for a non-agentive reading.

17

18 (6) German

19 a. *Der Schüler ärgert*  
 20 the.NOM.SG.F pupil:NOM.SG.F bother:3.SG  
 21 *den Lehrer.*

22 the.ACC.SG.M teacher:ACC.SG.M  
 23 ‘The pupil is bothering the teacher.’

24 b. *Die Möbel ärgern*  
 25 the.NOM.PL.N furniture:NOM.PL.N bother:3.PL

1           *den*           *Lehrer.*  
2           the.ACC.SG.M teacher:ACC.SG.M  
3           ‘The furniture bothers the teacher.’

4  
5       Korean is peculiar in that it does not possess a subclass of non-agentive accusative  
6       EO verbs. Korean accusative EO verbs are causatives derived from intransitive verbs.  
7       Their animate stimuli may be interpreted as volitionally acting agents, see (7a), while  
8       their inanimate stimuli are conceived of as causer, see (7b).

9

10 (7) Korean<sup>2</sup>

11       a.   *Suni-ka/-nun*   *hayngin-ul*   *yekkyep-key*   *hayss-ta.*

12           Suni-NOM/-TOP pedestrian-ACC disgust-ADV do:PST-DECL

13           ‘Suni nauseated the pedestrian.’

14       b.   *Kimchi(namsay)-ka/nun*   *hayngin-ul*   *yekkyep-key*   *hayss-ta.*

15           Kimchi(smell)-NOM/TOP pedestrian-ACC disgust-ADV do:PST-DECL

16           ‘The (smell of) Kimchi nauseated the pedestrian.’

17

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

### 1 3. Experiencers and case-marking

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

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

16

17 (8) German

18 *Dem Schüler gefällt der Lehrer.*

19 the.DAT.SG.F pupil:DAT.SG.M please:3.SG the.NOM.SG.M teacher:NOM.SG.M

20 ‘The pupil likes the teacher.’

21

22 In Modern Greek, oblique experiencers are either marked in genitive case (9a) or  
23 expressed by a prepositional phrase (9b) (an alternation that also appears with indirect  
24 objects in Modern Greek). Genitive/prepositional experiencers in Greek share all the

1 properties of datives in other languages and are therefore seen as the morphological  
2 spell-out of a dative case. There are no observations concerning differences between  
3 dative and accusative EO verbs in Greek; both types of experiencers are analyzed with  
4 as quirky subjects in the literature on this language.

5

6 (9) Greek

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

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

11 ‘The wine pleases Peter.’ (Anagnostopoulou 1999:78/79)

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

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

16 ‘The wine pleases Peter.’ (Anagnostopoulou 1999:69)

17

18 Korean dative EO verbs exhibit an alternation in case patterns: (a) dative experi-  
19 encer - nominative stimulus, see (10a), and (b) double nominative pattern, see (10b)  
20 (which is a marked construction used for contrastive topics). The topic suffix replaces  
21 the nominative marker in Korean, which gives rise to the pattern in (10c). Dative ex-  
22 periencers generally allow for free reordering, whereas the word order of double nom-  
23 inative constructions remains ‘experiencer-before-stimulus’. Word order freezing also  
24 applies when the dative experiencer is honorified (Lee, H. 2001: 42). It is crucial that  
25 the frozen order in this case is ‘dative-nominative’, whereas the frozen order with EO



1 accusative verbs is ‘nominative-accusative’. This is evident from examples with pre-  
 2 posed topic-marked objects such as in (11), in contrast to (7b), which are clearly dis-  
 3 preferred or even judged as ungrammatical by native speakers (Shin and Verhoeven  
 4 2009).<sup>3</sup> These phenomena imply that the basic order of accusative and dative experi-  
 5 encers is different.

6

7 (10) Korean

8 a. *Chelswu-eykey Mia-ka mwusewess-ta.*

9 Chelswu-DAT Mia-NOM be.frightening:PST-DECL

10 ‘Mia was frightening to Chelswu’

11 b. *Chelswu-ka Mia-ka mwusewess-ta.*

12 Chelswu-NOM Mia-NOM be.frightening:PST-DECL

13 ‘It was Chelswu (not Swuni) to whom Mia was frightening’

14 c. *Chelswu-nun Mia-ka mwusewess-ta.*

15 Chelswu-TOP Mia-NOM be.frightening:PST-DECL

16 ‘Mia was frightening to Chelswu’ (Rudnitskaya 2005:138)

17 (11) Korean

18 *\*/?hayngin-nun kimchi(namsay)-ka yekkyep-key hayss-ta.*

19 pedestrian-TOP Kimchi(smell)-NOM disgust-ADV do:PST-DECL

20 Intended: ‘The pedestrian, the (smell of) Kimchi nauseated him.’

21

22 In Hungarian, there is no evidence that either accusative or dative experiencers are  
 23 superior to the nominative argument.<sup>4</sup> Moreover, dative experiencers are not quirky  
 24 subjects in this language (Rákosi 2006; for an opposing view, see Dalmi 2005). Da-  
 25 tive-first orders with EO<sub>DAT</sub> verbs (see (12)) are judged to be equally as felicitous in

1 neutral contexts, as are accusative-first orders with EO<sub>ACC</sub> verbs (Rákosi 2006). How-  
2 ever, it has to be taken into account that placement in the topic position is only possi-  
3 ble with specific datives/accusatives in Hungarian. The fact that experiencers are able  
4 to occur in the topic position in all-new contexts reflects a discourse preference to  
5 make statements about individuals involved in experiential events (Rákosi 2006; É.  
6 Kiss 2005).

7

8 (12) Hungarian

9 *Péter-nek tetsz-ik Kati.*

10 Peter-DAT appeal.to-3.SG Kati

11 ‘Kate appeals to Peter.’ (Rákosi 2006:176)

12

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

19

20 (13) DATIVEFIRST

21 A dative argument is more likely than an accusative argument to occur before  
22 the nominative argument in the linearization.

23

24 The crucial question is where the difference between dative and the accusative  
25 comes from and why this difference occurs in some languages and not in others. The

1 first possibility is to assume that the observed asymmetry directly reflects a syntactic  
2 difference such that only with dative verbs the non-nominative occupies a higher posi-  
3 tion than the nominative. Indeed, some previous studies have pointed out that the em-  
4 pirical evidence for the higher status of experiencers is straightforward for dative  
5 verbs, whereas the empirical situation is not clear for the majority of accusative EO  
6 verbs (Fanselow 2000, 2003; Wegener 1998).

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

12 In many languages, morphological case is not always a valid cue for recognizing  
13 thematic roles. In German, for instance, nominative/accusative DPs are ambiguous in  
14 case for many inflectional paradigms, but nominative and dative are consistently dis-  
15 tinguished by the determiners and/or the inflectional form of the noun. The ambiguity  
16 risk with accusative arguments may have a blocking effect on deviations from canon-  
17 ical word order. The distinctness of morphological cases in the examined languages is  
18 gradient, following the scale in (14). In Hungarian and Korean, accusatives are distin-  
19 guished from nominatives with agglutinative suffixes, establishing a clear and trans-  
20 parent contrast between case forms. In Greek, there is a clear nominative/accusative  
21 contrast for masculine and feminine DPs for both numbers (expressed by the deter-  
22 miner and the inflectional form of the noun) while neuter DPs are ambiguous for  
23 nominative/accusative (but not so for dative). If the dative/accusative asymmetry is  
24 caused (at least in part) by case detectability, we expect the size of the asymmetry to  
25 correlate negatively with the scale in (14).

1

2 (14) Case distinctness

3 Hungarian/Korean > Greek > German

4

5 A further line of argument relates to the availability of alternative constructions  
6 that may be selected for an alternative linearization of the theta roles. For instance, in  
7 German and Dutch, EO accusative verbs have non-active counterparts that may be  
8 selected for an experiencer-first linearization. This option is not available for dative  
9 EO verbs, which may account for the higher frequencies of dative-first constructions  
10 in speech production (Lamers & de Hoop *forthc*; Lamers & de Schepper 2010). Thus,  
11 the accusative/dative contrast may simply be the compensatory effect of the presence  
12 of alternative constructions for accusative arguments. The accusative EO verbs of all  
13 languages in our sample have anticausative/deagentive counterparts with an ‘experi-  
14 encer < stimulus’ linearization in the canonical order, while this option is not availa-  
15 ble for dative EO verbs. In German, experiencer-oriented verbs are anticausatives  
16 (15a) or stative passives (15b). In Greek, many accusative EO verbs have mediopas-  
17 sive counterparts with an experiencer subject; see (15c). In Hungarian, the verbal al-  
18 ternates are formed with different suffixes; see (15d). In Korean, the causative verb is  
19 a derived form and the basis is a non-agentive intransitive verb; see (15e). Thus, if the  
20 dative/accusative asymmetry results from the compensatory effects of alternative con-  
21 structions, it is expected to apply to all languages in our sample.

22

23 (15) a. German anticausative

24 *x interessiert y* ‘x interests y’

- 1            *y interessiert sich für x* ‘y is interested in x’
- 2            b.    German stative passive
- 3            *x widert y an* ‘x disgusts y’
- 4            *y ist angewidert von x* ‘y is disgusted by x’
- 5            c.    Greek mediopassive
- 6            *x endiaféri y* ‘x interests y’
- 7            *y endiaférete ja x* ‘y is interested in x’
- 8            d.    Hungarian suffixation
- 9            *x érdekel y* ‘x interests y’
- 10           *y érdeklődik x iránt* ‘y is interested in x’
- 11           e.    Korean causativization
- 12           *x y pwukkulepkey hata* ‘x shames y’
- 13           *y x pwukkulepta* ‘y is ashamed of x’

#### 14    **4. Research aims**

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

22

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

12

13 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.

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

2

### 3 **5. Method**

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

#### 7 **5.1. Experimental factors**

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

11

12 (17) a. dependent variable

13 WORD ORDER (2 levels): OS vs. SO

14 b. fixed factors

15 CONTEXT (2 levels): object-topicalization licensing vs. neutral

16 VERB CLASS (2 levels): experiencer verb vs. non-experiencer verb

17

1       The target sentences were constructed in two versions, namely SO and OS; see  
2 German example (18). Illustrative sentences of the other languages as well as a dis-  
3 cussion of the necessary adaptations are given in the subsections on the individual  
4 languages in Section 6. The factor CONTEXT provides evidence for the possibility to  
5 use the constructions at issue under conditions that license topic-fronting. We com-  
6 pare the effect of a context licensing object topicalization with an all-new context es-  
7 tablishing the baseline. The neutral context was induced with the generic question  
8 ‘What’s new?’ preceding the target sentence. The context licensing object topicaliza-  
9 tion was established by a set-member relationship between the discourse topic (sub-  
10 ject of the context sentence) and the non-nominative argument of the target sentence.  
11 This relationship is known to induce topicalization (see ‘partial topics’ in Büring  
12 1999); an experimental setting with a similar manipulation is reported in Weskott et  
13 al. (2011), which has shown that part-whole relationships have a strong effect on li-  
14 censing object-fronting in German.

15

16 (18)   Context:

17       *Die meisten Sportler hatten keine Lust auf das Training.*

18       ‘Most athletes were not in the mood for training.’

19       Targets:

20       SO: *Die Übung hat dem Turner gefallen.*

21       OS: *Dem Turner hat die Übung gefallen.*

22       ‘(SO/OS) The gymnast was pleased by the routine.’

23

24       Since definiteness, animacy and agentivity are known to influence the lineariza-  
25 tion, they have to be controlled for in experiments on word order. Notably, animacy



1 and agentivity effects may interfere with possible experiencer effects on word order.  
2 In the present experiments, animacy-first effects are controlled for by having all rele-  
3 vant structures contain an inanimate nominative DP and an animate non-nominative  
4 DP. Since the animacy configuration is kept constant, effects of animacy do not inter-  
5 fere with the experimental conditions at issue. Additionally, agentive readings of the  
6 experiential and causative verbs are also eliminated by the use of inanimate nomina-  
7 tives that cannot exercise conscious control over the event. In order to control for def-  
8 initeness, we only included structures containing two definite DPs.

9 The implemented set-member relationship for contextual licensing of object front-  
10 ing concerns the animate non-nominative argument that is part of a group which is  
11 denoted by a salient antecedent (this manipulation differs from the material used in  
12 Weskott et al. 2011, which contained part-whole relations with inanimates). Further-  
13 more, as is evident from (18), we induced a contrast reading between the statement in  
14 the target sentence and the expectations implemented in the context sentence. A con-  
15 text inducing a non-contrastive reading of (18) would be: *Most athletes were in the*  
16 *mood for training*. The adversative relation between the context and the target sen-  
17 tence enhances the licensing effect. In a pilot forced-choice study in German we  
18 found that adversativity facilitates object-fronting: OS order was chosen in 78% of the  
19 cases with the adversative material ( $n = 128$ ; 8 speakers), while it was chosen in only  
20 63% of the cases with the non-adversative material ( $n = 128$ ; 8 speakers). Hence, ad-  
21 versativity strengthens the effect of contextual licensing. However, it is not a neces-  
22 sary condition for object-topicalization (Weskott et al. 2011 obtained object-fronting  
23 in German without similar manipulations).

24 The factor VERB CLASS has to disentangle the fronting effect of EO verbs from a  
25 baseline established by comparable constructions. In the accusative experiment, we

1 established the baseline with causative transitive verbs governing a patient object. For  
2 each language, we selected sixteen EO<sub>ACC</sub> verbs and sixteen causative transitive verbs  
3 by relying on the available literature about the respective verb classes and through  
4 elicitations with native speakers; see verbs in Appendix A. Hence, the items are nest-  
5 ed in the factor VERB CLASS in this experimental design. The selection of the verbs  
6 was made on the basis of qualitative elicitation with native speakers in order to  
7 achieve a list of items (with the intended animacy configuration) that is maximally  
8 natural in the respective language. As far as possible, these lists are translational  
9 equivalents of the German material that was created first, but adaptations of individual  
10 items were necessary in compliance with the verb inventory of each language as well  
11 as idiosyncratic preferences with respect to the naturalness of the target sentences.

12 In the dative experiment, EO<sub>DAT</sub> verbs were compared to unaccusative change of  
13 state verbs that can be construed with an unintentional causer/affectedness dative; see  
14 German example in (19a). Similar to the accusative experiment, we collected for each  
15 language sixteen EO<sub>DAT</sub> verbs and sixteen unaccusative verbs which combine with a  
16 causer/affectedness dative. Unintentional causers are external arguments hosted by the  
17 specifier position of an applicative phrase (AppIP) located above the VP (Schäfer  
18 2007, 2009), i.e. these datives are expected to precede the nominative argument of  
19 unaccusative verbs in the linearization. Assuming that the dative experiencer is also a  
20 higher argument than the nominative stimulus, the question is whether experiencer  
21 datives differ from unintentional causers in linearization. Semantically, these con-  
22 structions vary between readings implying that the higher argument involuntarily  
23 causes an event and readings in which the higher argument is affected (Ganenkov et  
24 al. 2008: 177). The same construction was used in Greek with a genitive-marked  
25 oblique causer (Rivero 2004: 238). In Hungarian, this construction does not occur

1 directly, although the Hungarian dative is a so-called ‘affectedness dative’, also ap-  
 2 pearing in external possession (see Lambert 2010; Haspelmath 1999). The closest  
 3 correspondence to the unintentional causer construction which we used in the Hungar-  
 4 ian dative experiment is illustrated in (19b). Following Rákosi (2014), the default  
 5 reading of this construction is the following reading: ‘the participant finally (as a re-  
 6 sult of efforts) succeeds in doing something, although it is not quite expected’  
 7 (Ganenkov et al. 2008: 177). In contrast to the (grammaticalized) unintentional causer  
 8 construction, the Hungarian construction is unrestricted as to the transitivity and  
 9 telicity of the predicate occurring in it. The acceptability of this construction increases  
 10 with the use of an adverb that makes the intentional contribution of the dative-marked  
 11 participant explicit (e.g., *könnyen* ‘easily’). Given the causative/agentive semantics  
 12 and the compatibility with any predicate, the structural position of the Hungarian da-  
 13 tive causer should be equally superior to that of the VP.

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

22

23 (19) a. German (dative exp., non-experiencer verb, OS)

24	<i>Dem</i>	<i>Hilfskoch</i>	<i>ist</i>
25	the:DAT.SG.M	assistant.cook:DAT.SG.M	be:3.SG

1           *der*           *Nachtisch*           *angebrannt.*  
2           the.NOM.SG.M   dessert:NOM.SG.M   burn:PTCP.PERF.PASS

3           ‘The cook’s assistant unintentionally burnt the dessert.’

4       b.   Hungarian (dative exp., non-experiencer verb, SO)

5           *A*       *tészta*       *gyorsan*       *megfőtt*   *a*   *szakács-nak.*  
6           the       noodles       quickly       cook:PST   the   cook-DAT

7           ‘The cook (finally) succeeded in cooking the noodles quickly.’

8       c.   Korean (dative exp., non-experiencer verb, OS)

9           *silsupsayng-eykey*   *kilum-i*    *thwiess-ta.*  
10          assistant.cook-DAT   oil-NOM    splatter:PST-DECL

11          ‘The oil splattered on the assistant cook.’

## 12   **5.2. Material and procedure**

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

17   Based on a latin-square design, we created 16 pseudo-randomized lists, each con-  
18   taining 16 items (8 items of each VERB CLASS). Each item represented one of the lev-  
19   els of CONTEXT, so that each list contained four repetitions of each experimental con-  
20   dition. The targets were mixed with filler items that also present a decision between  
21   an SO and an OS order (32 fillers in the accusative experiment, 40 fillers in the dative  
22   experiment). Each item was presented as two context-target pairs (context C with tar-  
23   get alternative A and context C with target alternative B). For any particular context,  
24   test subjects were instructed to choose the best among two options where both repre-

1 sent the same content (an SO and an OS version). The experiments were run as web-  
 2 based studies (implemented in OnExp<sup>5</sup>). Each experimental session took approximate-  
 3 ly 15 minutes and was unpaid. 32 monolingual native speakers took part in each ex-  
 4 periment, as outlined in Table 2. The links to the website of the experiments were  
 5 distributed by associate researchers in the countries in which the relevant languages  
 6 are spoken. All participants took part in only one of the two experiments per lan-  
 7 guage.

8

9 *Table 2. Participants of the experimental studies*

		<i>n</i>	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

### 10 **5.3. Data analysis**

11 The obtained data consists of frequencies for two complementary options, SO and OS,  
 12 for four experimental conditions. In order to draw statistic inferences, we fitted gener-  
 13 alized linear mixed-effects models on the data. In all following analyses, the fixed  
 14 factors are VERB CLASS (non-experiencer; experiencer) and CONTEXT (object-  
 15 topicalization licensing; neutral). Contrasts between factor-levels were modeled such  
 16 that the level of interest (VERB CLASS: experiencer; CONTEXT: object-topicalization

1 licensing) is compared to its complement (VERB CLASS: non-experiencer; CONTEXT:  
2 neutral) as a baseline. The estimates in the following result tables represent the effect  
3 of the level of interest whereby the baseline is assumed to be zero.

4 Participating SUBJECTS and ITEMS were modeled as random factors. The model  
5 contained the intercepts, the slopes of both random factors with CONTEXT, and the  
6 slope of the factor SUBJECTS with ITEMS (ITEMS were nested within VERB CLASS). The  
7 random-effects structure was kept constant in all experiments without factor-reduction  
8 procedures following proposals in Barr et al. (2013), which warrants the comparabil-  
9 ity of the cross-linguistic findings. The significance of the fixed effects was estimated  
10 with a log-likelihood test on model comparison. For the significance of the interaction  
11 effects, we compared a model containing both fixed factors and their interaction with  
12 a model in which the interaction was removed. For estimating the significance of the  
13 main effects, we compared a model with two main effects with a model in which the  
14 effect of interest was removed. All log-likelihood tests are minimal pairs with the  
15 same random-effect structure, only differing in the presence/absence of the effect of  
16 interest; hence, the chi-square values constantly have  $df=1$ . All analyses reported in  
17 this article were performed in *R* (R Core Team 2013, Version 3.0.2).

18 **6. Results**

19 **6.1. German**

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

1

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

3 a. *Der Umsatz hat*  
4 the:NOM.SG.M sales:ACC.SG.M have:3.SG  
5 *den Fleischer erfreut.*  
6 the:ACC.SG.M butcher:ACC.SG.M please:AOR:3.SG

7 ‘The sales made the butcher happy.’

8 b. *Den Fleischer hat der Umsatz erfreut.*

9

10 The obtained choices per condition are summarized in Table 3 and visualized in Fig-  
11 ure 1. There are no missing values in our dataset, i.e. the OS and SO data sum up to  
12 128 for every condition in both experiments. The results of the accusative experiment  
13 suggest that both factors at issue have independent effects that are cumulated in the  
14 individual conditions. Starting with the accusative objects, the proportions of OS or-  
15 ders in the non-licensing context reveal a difference: 20% OS order for non-  
16 experiencers vs. 41% for experiencers. The object-topicalization context has an addi-  
17 tive effect, raising the proportions of OS to 57% for non-experiencers and 70% for  
18 experiencers. The proportions of OS in the dative data are generally higher. The OS  
19 orders are more frequent with non-experiencer dative constructions and the context  
20 does not exercise a substantial influence.

21

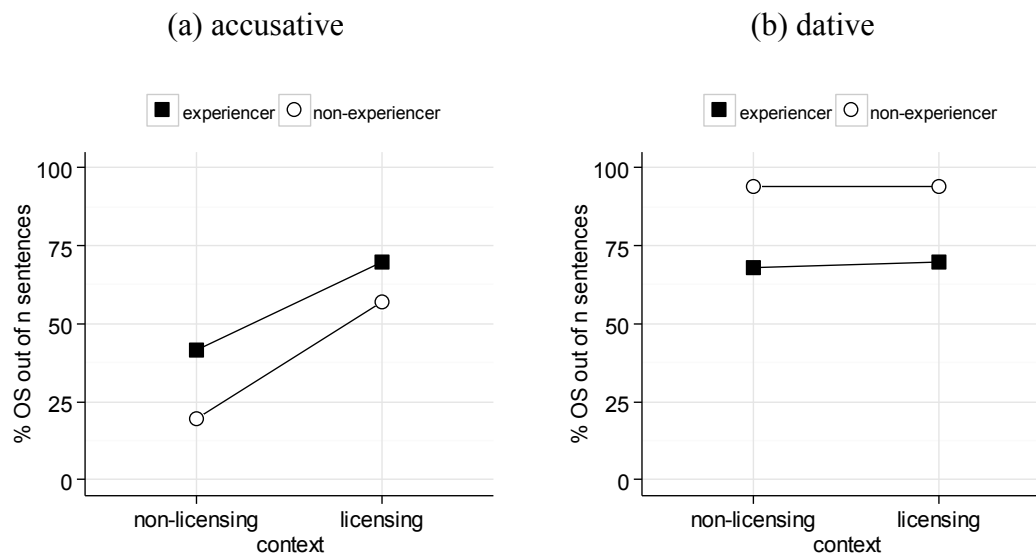
1

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

		experiencer verbs				non-experiencer verbs				total	
		non-licensing		licensing		non-licensing		licensing			
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
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

2

3

Figure 1: *Proportions of OS in German*

4

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

11



1

Table 4. *Model parameters: German experiments*

	fixed factor	estimate	$\chi^2(1)$	<i>p</i>
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

2 **6.2. Greek**

3 In Greek, the OS sentences contain a clitic pronoun that is coreferent with the pre-  
4 posed argument (this is the CLLD construction; see Section 2.2 for discussion); see  
5 (21a). The clitic had to occur in both SO and OS orders in the oblique experiment,  
6 because native speakers judged the versions without clitic doubling as only possible  
7 under restricted contextual conditions that do not apply in our setting (namely, narrow  
8 focus on the preverbal argument); see (21b).

9

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

11 *Ton*                    *ayróti*                    *ton*                    *charopíse*  
12 the:ACC.SG.M    farmer:ACC.SG.M    3.SG.ACC.M    please:AOR:3.SG  
13 *i*                            *vroχí.*  
14 the:NOM.SG.F    rain:NOM.SG.F

15 ‘The farmer, the rain made him happy.’

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

1            *I*                    *patríða*                    *tu*                    *élipe*  
2            the:NOM.SG.F homeland:NOM.SG.F 3.SG.GEN.M lack:AOR:3.SG  
3            *tu*                    *oðiyú.*  
4            the:GEN.SG.M driver:GEN.SG.M  
5            ‘The driver missed his home(land).’

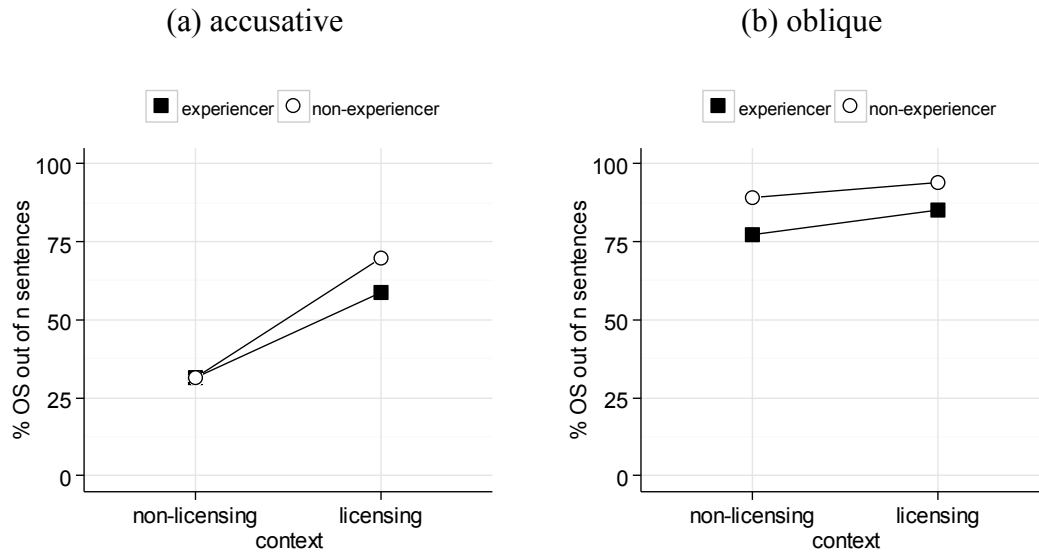
6  
7            The obtained frequencies are summarized in Table 5 (see OS proportions in Figure  
8            2). The frequencies of OS with accusative verbs are identical for both verb classes in  
9            the non-licensing contexts (31%). The probability of choosing OS increases in con-  
10           texts licensing object topicalization, whereby a slight advantage for non-experiencer  
11           verbs is observed. In the dative data, OS orders are generally more frequent. Similar  
12           to German, the OS order appears more frequently with non-experiential obliques  
13           (89% vs. 77% in neutral context). Moreover, Figure 2b suggests an effect of CONTEXT  
14           with Greek obliques, which is, however, not as strong as the corresponding effect of  
15           CONTEXT in the accusative data (compare Figure 2a with Figure 2b).

16  
17            Table 5. *Frequencies of OS/SO in Greek*

		experiencer verbs				non-experiencer verbs				total	
		non-licensing		licensing		non-licensing		licensing			
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
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

18  
19

1

Figure 2: *Proportions of OS in Greek*

2

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

7

8

Table 6. *Model parameters: Greek experiments*

	fixed factor	estimate	$\chi^2(1)$	<i>p</i>
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

9

1 The results obtained for Greek are similar to the findings in German. The crucial dif-  
2 ference is the lack of an effect for experiencer verbs in the accusative data. The over-  
3 all frequency of OS order is slightly higher in Greek (686 out of 1024 tokens, i.e.  
4 67%) than in German (656 out of 1024, i.e. 64%).

### 5 **6.3. Hungarian**

6 The first argument of the Hungarian experimental target structures appeared in the  
7 topic position for both SO and OS. The particle of the items with particle verbs was  
8 placed in front of the verb, which guarantees that the preverbal argument is a topic  
9 (since preverbal focus attracts the finite verb, stranding the particle in the postverbal  
10 domain (É. Kiss 1998); see (22a). For the dative experiment, we used preverbal ad-  
11 verbs with both experiencer and non-experiencer verbs, since these adverbs were  
12 judged necessary for the interpretation of the intended reading of the unintentional  
13 causer construction; see (22b), compare with (19b) (see discussion in Section 5.1).

14

15 (22) a. Hungarian (accusative exp., experiencer verb, OS)

16 *A rablót meg-félemlítette a fegyver.*

17 the robber-ACC PTCL-frighten:PST the weapon

18 ‘The robber, the weapon frightened him.’

19 b. Hungarian (dative exp., experiencer verb, SO)

20 *Az áru nagyon ízlett a hentes-nek.*

21 the goods very taste:PST the butcher-DAT

22 ‘The goods were very tasteful for the butcher.’

23

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

10  
 11

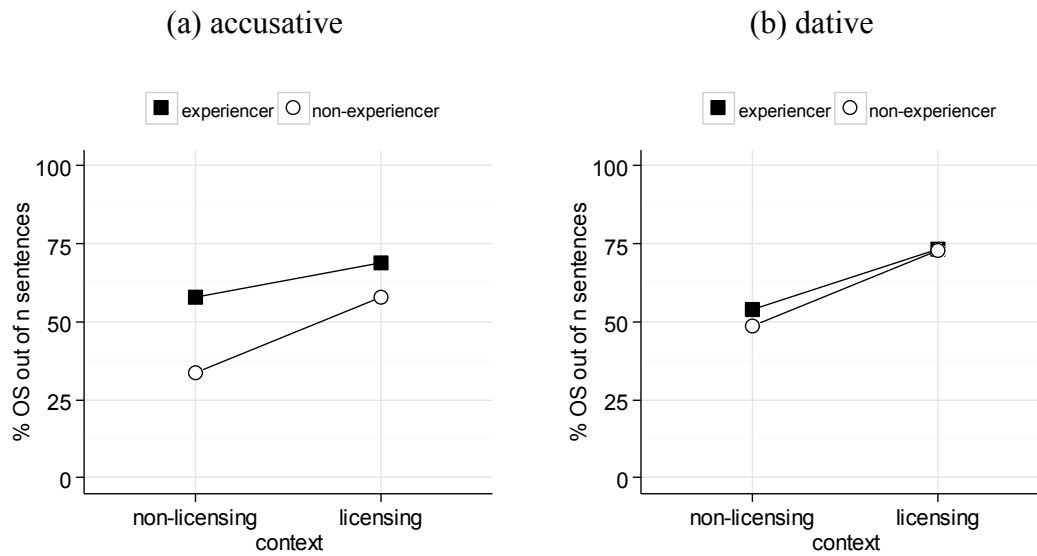
Table 7. *Frequencies of OS/SO in Hungarian*

		experiencer verbs				non-experiencer verbs				total	
		non-licensing		licensing		non-licensing		licensing			
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
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

12

1

Figure 3: *Proportions of OS in Hungarian*



2

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

8

1

Table 8. *Model parameters: Hungarian experiments*

	fixed factor	estimate	$\chi^2(1)$	<i>p</i>
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

2

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

## 9 **6.4. Korean**

10 Korean is a language with morphological topic-marking, so that a given subject and/or  
11 object could be either case-marked and/or topic-marked in the experimental target  
12 structure. The Korean sentences required the use of case-marked DPs (instead of top-  
13 ic-marking) in order to be able to observe the pure effect of word order and to avoid  
14 the freezing effects that arise when replacing case suffixes with the topic marker;<sup>6</sup> see  
15 illustrative examples in (23). Instead of an unintentional causer construction, which is  
16 not available in Korean, we used a construction with a directional dative implying

1 affectedness of the respective individual by a motion event encoded in an intransitive  
2 verb; see (19c) and discussion in Section 5.1.

3

4 (23) a. Korean (accusative exp., experiencer verb, SO)

5 *pi-ka nongpwu-lul humwusha-key hayss-ta.*

6 rain-NOM farmer-ACC happy-GER do:PST-DECL

7 ‘The rain made the farmer happy.’

8 b. Korean (dative exp., experiencer verb, SO)

9 *kohyang-i wuncenkisa-eykey kuliwess-ta.*

10 homeland-NOM driver-DAT lack:PST-DECL

11 ‘The driver missed his home(land).’

12

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



1 65%, for verbs in licensing contexts vs. 154 out of 256 tokens, i.e. 60%, for verbs in  
 2 non-licensing contexts).

3

4

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

		experiencer verbs				non-experiencer verbs				total	
		non-licensing		licensing		non-licensing		licensing			
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
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

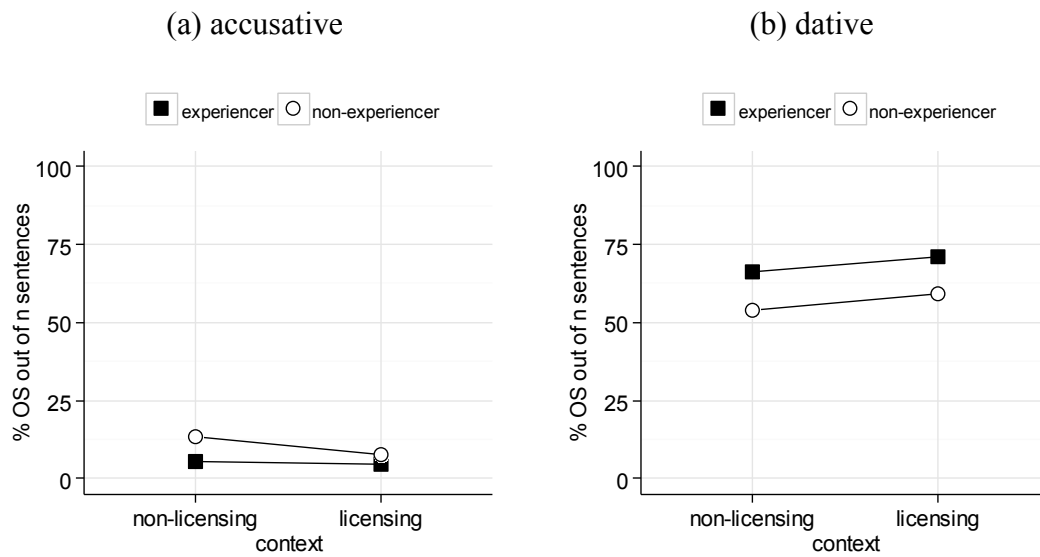
5

6

7

8

Figure 4: *Proportions of OS in Korean*



9

10 The generalized linear mixed-effects model reveals a significant effect of VERB CLASS  
 11 in the accusative experiment reflecting the difference between OS frequencies with

1 experiencer verbs ( $n = 13$ ; 2.5%) and non-experiencer verbs ( $n = 27$ ; 5.3%). However,  
 2 although the proportions in Figure 4b suggest effects of both VERB CLASS and  
 3 CONTEXT in the dative experiment, these effects do not reach statistical significance.

4

5

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

6

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

## 12 7. Discussion

13 The results presented in Section 6 reveal cross-linguistic differences in the role of case  
 14 as well as in the role of verb class. In both experimental studies, we used disharmonic  
 15 animacy configurations, i.e., the baseline in our data may involve an effect of animacy  
 16 on word order. However, the observed differences are informative for the influence of

1 VERB CLASS and CONTEXT of each case – independently of animacy effects. In the  
 2 accusative data, German and Hungarian display an effect of VERB CLASS, providing  
 3 evidence for EXPERIENCERFIRST as formulated in (1). Moreover, German, Greek, and  
 4 Hungarian show a significant main effect of CONTEXT, which reflects a TOPICFIRST  
 5 effect that applies to the same constructions. The two effects are cumulated without  
 6 significant interaction in German and Hungarian. There is no VERB CLASS effect in  
 7 the Greek data; Korean has a different data pattern with very low frequencies of OS  
 8 order and a VERB CLASS effect that challenges EXPERIENCERFIRST.

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

17

18

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	–	–

19

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

7       Starting with the accusative/dative contrast, our findings confirm the observations  
8 and intuitions that datives are more likely than accusatives to occur first in an utter-  
9 ance; previous data on such observations come primarily from studies on Germanic  
10 languages (German in Lenerz 1977; Hoberg 1981; Kempen and Harbusch 2003; Ba-  
11 der and Häussler 2010; Dutch in Lamers and de Schepper 2010). Our findings support  
12 this observation, including additional languages, which allows for conclusions about  
13 the related grammatical features that may explain this contrast. In particular, two dif-  
14 ferences between accusative and dative are visible in the presented data: (a) datives  
15 are chosen as first arguments more frequently than accusatives, whereby the differ-  
16 ences between cases reveal the following scale: Korean (dative OS – accusative OS =  
17 55%) > Greek (38%) > German (34%) > Hungarian (8%); (b) the context has an ef-  
18 fect in more languages in the accusative data (German, Greek, and Hungarian) than  
19 the dative data (only Hungarian).

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

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

9 A third account is based on the compensatory effects of alternative constructions  
10 for preposing the experiencer. Accusatives can be preposed through diathetic alterna-  
11 tions, which are not available for datives (Lamers and de Schepper 2010). Many EO  
12 verbs have anticausative counterparts with a nominative experiencer in a higher posi-  
13 tion; see (15) and discussion in Section 3. The availability of alternative constructions  
14 introduces a difference between accusatives and datives that equally holds for all ex-  
15 amined languages, i.e., this phenomenon correctly predicts the dative/accusative dif-  
16 ference in all languages, but it does not account for the observed scale between lan-  
17 guages. Assuming that the large effect of case in Korean (55%) is explained by a re-  
18 striction only applying to EO accusative verbs, the unexpected fact is the difference  
19 between the large effect in German (34%)/Greek (38%) and the small effect in Hun-  
20 garian (8%).

21 Let us now examine the potential effects of structural differences. It has been  
22 claimed that linearization preferences are not reliable indicators of phrase structure,  
23 since independent principles may lead to linearization preferences that do not directly  
24 reflect hierarchical structure (Müller 1999). In particular, assumptions about phrase  
25 structure should be primarily based on evidence for hierarchical relations, and this is

1 not the type of data provided by the experiments under discussion. In the following,  
2 we refer to linearization statements about the order of cases (in the sense of Müller  
3 1999). Though the relation between generalizations on case order and phrase structur-  
4 al accounts has been discussed, we refrain from using the findings on case order to  
5 draw conclusions about phrase structure.

6 Our data reveals a contrast between the order of accusative and dative DPs. In the  
7 absence of a contextual or thematic trigger, accusative DPs most frequently follow  
8 nominative DPs in all languages in our sample. On the other side, dative DPs prefera-  
9 bly precede nominative DPs. This generalization is summarized in (24). The case or-  
10 der in (24a) corresponds to phrase structure accounts that analyze accusative EO verbs  
11 on a par with canonical transitive verbs (Sternefeld 1985; Grewendorf 1989; Fanselow  
12 2000). Accounts assuming that accusative experiencers are located higher in the  
13 phrase structure than the nominative stimuli (e.g., Landau 2010) need additional as-  
14 sumptions in order to account for the accusative/dative contrast in the presented data,  
15 i.e., they need to assume that the linearization principles on case order are independ-  
16 ent from phrase structure. The case order in (24b) must be restricted to a particular  
17 type of dative, i.e. the dative of unaccusative predicates (which applies both to dative  
18 experiencers and unintentional causer datives). It does not apply to lexically selected  
19 datives (e.g., with verbs like *helfen* ‘to help’), nor to the dative of indirect objects. The  
20 relation of the linearization statement in (24b) to the phrase structure is straightfor-  
21 ward: datives with unaccusative verbs are higher than nominatives in the verb projec-  
22 tion (see Schäfer 2009 for unintentional causes).

23

24 (24) Case order: Linearization principles

25 a. < nominative > accusative >

1           b.   < dative           > nominative > (with unaccusative verbs)

2

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

12          In the accusative data, the OS order is frequently chosen in German, Hungarian,  
13 and Greek. Furthermore, all three languages have a main effect of CONTEXT, showing  
14 that the same construction that appears with fronted experiencers can be triggered by  
15 contexts inducing topicalization. However, German and Hungarian differ from Greek  
16 in that these two languages display an additional effect of VERB CLASS (Table 11).  
17 The question is which typological feature accounts for this difference. Crucial are the  
18 properties of the syntactic operation underlying OS orders in these languages. Prepos-  
19 ing an object in German involves scrambling the object over the subject, which is re-  
20 ported to be triggered by several preferences on linearization such as case, animacy,  
21 etc.; the topic position in Hungarian is a position that must be filled with stative predi-  
22 cates if no narrow focus is available (see Section 2.2). In contrast to these languages,  
23 clitic left-dislocation in Greek is a construction hosting contrastive topics or establish-

1 ing links to the common ground and not a construction that is used to establish  
2 aboutness relations.

3 The critical issue is how speakers select linearizations in all-new contexts. We as-  
4 sume that the results reflect preferences in establishing aboutness relations with par-  
5 ticular types of arguments; see (3). The intuition that is reflected in speakers' choices  
6 is that it is more likely to make a statement about an experiencer than about the pa-  
7 tient of a canonical verb. This preference is reflected in object-fronting constructions  
8 that can host aboutness topics. This is the case for scrambled objects in German and  
9 objects in the topic position in Hungarian. Clitic left-dislocation in Greek is not such a  
10 construction; hence the fact that CLLD is not selected in order to establish an  
11 aboutness relation is not a surprising effect. The observed difference in the Greek data  
12 does not confirm the intuition that clitic left dislocation with Greek EO verbs occurs  
13 without a contextual trigger (as reported in Anagnostopoulou 1999). The external va-  
14 lidity of our finding is corroborated by observations in speech production. In a pro-  
15 duction study with Greek experiencer-verbs, speakers produced experiencer-first ex-  
16 pressions in 39% of the cases with inanimates and 23% with animates: in all experi-  
17 encer-first expressions, Greek speakers selected mediopassive verbs with an experi-  
18 encer subject and never produced an ACC-NOM order (Verhoeven 2014). The con-  
19 clusion is that clitic left-dislocation is not the type of construction that speakers use in  
20 order to express aboutness with respect to the accusative argument, even in the case of  
21 experiencers. Our account is summarized in (25).

22

23 (25) < aboutness-topic > comment >

24 applying to:



- 1           – scrambling objects over subjects;  
2           – topicalizing objects in languages in which the topic position must be filled;

3

4       Turning to the results of the dative experiment, the large difference between da-  
5 tives and accusatives directly reflects the view that dative EO verbs are unaccusatives,  
6 involving a dative experiencer in a higher position than the governed nominative; see  
7 (26a). The same holds for unintentional causers which occupy the specifier position of  
8 applicative phrases (AppIP), taking a higher position than the theme in the clause  
9 structure; see (26b).

10

11 (26) Dative-nominative

12       a. [VP experiencer<sub>DAT</sub> [V' stimulus<sub>NOM</sub> V ] ]

13       b. [AppIP causer [VP theme V ] ]

14

15       The assumptions in (26b) accounts for the contrast between accusative and dative  
16 experiencers in Korean. Since dative experiencers are higher than the nominatives, the  
17 configuration ‘animate dative (higher argument) and inanimate nominative (lower  
18 argument)’ is not an instance of disharmonic mapping of animacy with the thematic  
19 role hierarchy; hence, the freezing effects do not apply. The effect of case in Hungari-  
20 an (8% more experiencer-fronting with datives) is smaller than the corresponding ef-  
21 fects in the other languages (above 30%). The property that sets Hungarian apart from  
22 the other languages in this study is that there is no syntactic evidence that dative ar-  
23 guments crucially differ from accusative arguments in this language, in particular da-  
24 tive experiencers do not show quirky subject properties (see Section 3). This is in line  
25 with the analysis that dative experiencers are governed VP-arguments in Hungarian,

1 i.e., dative experiencer verbs are not unaccusatives.<sup>7</sup> In this view, the reported results  
2 reveal two differences between governed experiencer objects (accusative experiencers  
3 in all languages and dative experiencers in Hungarian) and experiencer datives with  
4 unaccusative verbs (dative experiencers in German, Greek, and Korean):

5

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

13

14 In our experimental study, we used a particular kind of contextual licensing that  
15 affected object-topicalization (see Section 5.1). In particular, the contexts involved a  
16 set-member relationship between an argument in the target clause and a salient ante-  
17 cedent in discourse. Our findings enrich the knowledge about the contextual condi-  
18 tions that induce object-fronting (see previous findings on whole-part relations in  
19 Weskott et al. 2011). The comparison to experiencer-fronting reveals that partial top-  
20 ics trigger the fronting of a lower argument in a superset of the syntactic constructions  
21 that allow for fronting aboutness-topics; compare with (25).

22

23 (28) < partial-topic > comment >

24 applying to:

- 1           – scrambling objects over subjects;
- 2           – topicalizing objects in languages in which the topic position must be filled;
- 3           – clitic left dislocation.

4

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

## 19 **8. Summary**

20 The aim of the present study was to collect precise estimates of EXPERIENCERFIRST  
21 effects across languages and to account for the source of cross-linguistic differences  
22 in this domain. We conducted forced-choice experiments examining the impact of  
23 verb class and context on fronting dative/accusative constituents in four languages:

1 German, Greek, Hungarian, and Korean. The obtained data revealed substantial dif-  
2 ferences across languages that demand a typological explanation.

3 We observed that there is a large difference between dative and accusative experi-  
4 encers, such that the preference for EXPERIENCERFIRST is stronger in the former than  
5 in the latter case. From the properties of the investigated languages, we concluded that  
6 the exact data pattern cannot be explained through performance principles relating to  
7 the avoidance of ambiguity risks or the compensatory effects of alternative construc-  
8 tions. The typological pattern is explained if we take into account the fact that datives  
9 are higher arguments of unaccusative verbs in some languages; exactly in these lan-  
10 guages (German, Greek, and Korean in our sample), there is a large difference be-  
11 tween datives and accusatives in the linearization preferences.

12 The constructions that were used to front experiencer arguments were also shown  
13 to be sensitive to contexts that topicalize lower arguments. This applies to accusative  
14 experiencers in Greek/German and all non-nominative experiencers in Hungarian. An  
15 additive effect of CONTEXT did not appear in configurations in which the experiencer  
16 is a higher argument. This finding is in line with the hypothesis that at least a part of  
17 the EXPERIENCERFIRST effects result from the discourse preference to topicalize expe-  
18 riencers – without any syntactic assumptions about their position in hierarchical struc-  
19 ture. This view was further supported by the typological variation in the presence of  
20 EXPERIENCERFIRST effects: we found such effects in scrambling (German) as well as  
21 in topicalization in a language in which the topic position must be filled (Hungarian),  
22 i.e., in structural configurations that may host aboutness topics in general. We did not  
23 find such effects in Clitic Left Dislocation, a construction that requires a stronger con-  
24 textual trigger than aboutness (i.e., contrastive topicalization).

1 This study contributes to the research on experiencer-object verbs with presenting  
2 replicable cross-linguistic data collected under identical conditions in the individual  
3 languages. In the four examined languages, we found essential typological differences  
4 that are not yet explored, since they cannot be easily captured through singular intui-  
5 tions. Furthermore, we were able to draw conclusions about the sources of particular  
6 phenomena by taking into account the grammatical properties of the investigated lan-  
7 guages. We close this study with the observation that cross-linguistic experiments are  
8 a promising paradigm bearing advancements in our knowledge about grammatical  
9 phenomena.

## 10 **Notes**

11 <sup>1</sup> Here and throughout the article, the labels SO and OS for the two basic word or-  
12 der alternatives are chosen based on the traditional understanding of the notion subject  
13 (S) as the nominative argument, which is not a claim about the syntactic status of non-  
14 nominative experiencers.

15 <sup>2</sup> For the transliteration of the Korean examples, we use the Yale romanization.

16 <sup>3</sup> Note that this observation is an instance of the constraints blocking deviations  
17 from the basic word order mentioned in Section 2.2.

18 <sup>4</sup> This observation is related to the assumption of a flat VP structure containing  
19 both the experiencer and the stimulus argument (É. Kiss 2003; Rákosi 2006). See É.  
20 Kiss (2008) for a discussion of arguments for a flat vs. a hierarchical VP structure.

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

1       <sup>6</sup> Topic-marking of the dative constituent introduces an ambiguity between the da-  
2 tive-nominative and the double nominative construction; see (10c). Topic-marked  
3 preposed animate objects occurring with nominative-marked inanimate subjects are  
4 judged as non-acceptable in Korean (see example (11]). Note furthermore that in Ko-  
5 rean (as in German), scrambling of case-marked objects into sentence-initial position  
6 functions as information structural reordering. Depending on prosodic properties, ei-  
7 ther a topic-comment structure or a contrastive focus reading of the preposed consti-  
8 tuent is a possible option, the former being tied to a neutral intonation (see Choi 1996).

9       <sup>7</sup> This characterization conforms with one class of dative experiencers analyzed in  
10 Rákosi 2006 as so-called thematic adjuncts of unergative verbs, as e.g., *megfelel* ‘be  
11 suitable’; verbs from this class have been mainly used in our experiment (see Appen-  
12 dix A, Table C). A further class of experiencer arguments (with verbs as *tetszik* ‘ap-  
13 peal to’) possess an unaccusative thematic structure in this analysis, which is, howev-  
14 er, not reflected configurationally, as Rákosi assumes a flat VP. In any case, as men-  
15 tioned before, neither of these experiencer datives shows quirky subject properties.

16

## 17 **Abbreviations**

18 ACC – accusative, ADV – adverbial, AOR – aorist, DAT – dative, DECL – declara-  
19 tive, GEN – genitive, GER – gerund, LOC – locative, M – masculine, NOM – nomi-  
20 native, PASS – passive, PERF – perfect, PL – plural, PST – past, PTCL – particle,  
21 PTCP – participle, SG – singular, TOP – topic

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24

25

# 1 Appendix A. Verb lists

## 2 A. German

	accusative		dative	
	experiencer	non-experiencer	experiencer	non-experiencer
1	<i>plagen</i> ‘annoy’	<i>behindern</i> ‘hinder’	<i>schwerfallen</i> ‘be difficult’	<i>verloren gehen</i> ‘become lost’
2	<i>erstaunen</i> ‘astonish’	<i>schützen</i> ‘protect’	<i>wehtun</i> ‘hurt’	<i>auskippen</i> ‘tip’
3	<i>entmutigen</i> ‘discourage’	<i>verändern</i> ‘change’	<i>leidtun</i> ‘feel sorry’	<i>einlaufen</i> ‘shrink’
4	<i>begeistern</i> ‘enthuse’	<i>heilen</i> ‘heal’	<i>schmecken</i> ‘have a taste’	<i>anbrennen</i> ‘scorch’
5	<i>verängstigen</i> ‘frighten’	<i>wecken</i> ‘wake up’	<i>nahegehen</i> ‘affect’	<i>abbrechen</i> ‘break’
6	<i>interessieren</i> ‘interest’	<i>abholen</i> ‘pick up’	<i>leichtfallen</i> ‘be easy’	<i>volllaufen</i> ‘swamp’
7	<i>erfreuen</i> ‘delight’	<i>retten</i> ‘rescue’	<i>entfallen</i> ‘slip the mind’	<i>auslaufen</i> ‘leak/run out’
8	<i>langweilen</i> ‘bore’	<i>zerstören</i> ‘destroy’	<i>zusagen</i> ‘appeal’	<i>ausgehen</i> ‘run out’
9	<i>anwidern</i> ‘disgust’	<i>vergiften</i> ‘poison’	<i>missfallen</i> ‘dissatisfy’	<i>runterfallen</i> ‘fall down’
10	<i>entzücken</i> ‘rapture’	<i>verbessern</i> ‘improve’	<i>vergehen</i> ‘put off’	<i>kaputtgehen</i> ‘get broken’
11	<i>frustrieren</i> ‘frustrate’	<i>verletzen</i> ‘injure’	<i>auffallen</i> ‘attract attention’	<i>zerreißen</i> ‘rupture’
12	<i>wundern</i> ‘wonder’	<i>warnen</i> ‘warn’	<i>einfallen</i> ‘spring to mind’	<i>umkippen</i> ‘tip over’
13	<i>beunruhigen</i> ‘worry’	<i>blenden</i> ‘bedazzle’	<i>gefallen</i> ‘appeal’	<i>verschimmeln</i> ‘get moldy’
14	<i>erschrecken</i> ‘scare’	<i>infizieren</i> ‘infect’	<i>einleuchten</i> ‘make sense’	<i>überlaufen</i> ‘flood’
15	<i>aufregen</i> ‘upset’	<i>aufhalten</i> ‘hold back’	<i>entgehen</i> ‘fail to notice’	<i>zerbrechen</i> ‘break’
16	<i>enttäuschen</i> ‘disappoint’	<i>blamieren</i> ‘disgrace’	<i>fehlen</i> ‘miss’	<i>abbrennen</i> ‘burn away’

3

## 4 B. Greek

	Accusative		dative	
	experiencer	non-experiencer	experiencer	non-experiencer
1	εκνευρίζω <i>eknevrizo</i> ‘upset’	προειδοποιώ <i>proidopio</i> ‘warn’	χεφεύγω <i>kseféγω</i> ‘slip the mind’	υπερχειλίζω <i>iperxilizo</i> ‘overflow’



2	ενδιαφέρω <i>endiaféro</i> 'interest'	βοηθάω <i>voitháo</i> 'helpen'	βρομάω <i>vromáo</i> 'have a unpleasant smell'	πέφτω <i>péfto</i> 'fall down'
3	χαροποιώ <i>charopió</i> 'delight'	καταστρέφω <i>katastréfo</i> 'destroy'	μου φαίνεται εύκολο <i>mu fénete évkolo</i> 'be easy'	κόβω <i>kóno</i> 'clod'
4	καταρακώνω <i>katarakóno</i> 'discourage'	δηλητηριάζω <i>dilitiriázo</i> 'poison'	διαφεύγω <i>diaféngo</i> 'fail to notice'	χύνομαι <i>χίνομαι</i> 'tip over'
5	στενοχωρώ <i>stenochoró</i> 'sadden'	ξυπνάω <i>ksipnáo</i> 'wake up'	μου πέφτει βαρύς <i>mu péfti varís</i> 'be difficult'	πλημμυρίζω <i>plimírizo</i> 'swamp'
6	προβληματίζω <i>provlimtízo</i> 'worry'	εμποδίζω <i>embodízo</i> 'hinder'	μου φαίνεται ικανοποιητικό <i>mu fénete</i> <i>ikanopiitikó</i> 'satisfy'	μπλοκάρω <i>blokáro</i> 'block'
7	ενθουσιάζω <i>enthusiázo</i> 'inspire'	καθυστερώ <i>kathisteró</i> 'delay'	κολλάω <i>koláo</i> 'stuck in mind'	χαλάω <i>chaláo</i> 'break'
8	ενοχλώ <i>enochló</i> 'annoy, bother'	τυφλώνω <i>tiflóno</i> 'bedazzle'	μου φαίνεται άνοστο <i>mu fénete ánosto</i> 'have a bland taste'	καταστρέφω <i>katastréfo</i> 'get broken'
9	ταράζω <i>tarázo</i> 'stir up, upset'	προστατεύω <i>prostatevo</i> 'protect'	λείπω <i>lípo</i> 'miss'	μουχλιάζω <i>muχliázo</i> 'get moldy'
10	κουράζω <i>kurázo</i> 'bore'	βελτιώνω <i>veltióno</i> 'improve'	μου φαίνεται αηδιαστικό <i>mu fénete aidíastikó</i> 'disgust'	τελειώνω <i>telióno</i> 'run out'
11	σοκάρω <i>sokáro</i> 'shock'	τρυπάω <i>tripáo</i> 'pierce'	στοιχίζω <i>stixízo</i> 'cost emotionally'	καίγομαι <i>kégome</i> 'burn'
12	απογοητεύω <i>apogoítevo</i> 'disappoint'	παραλαμβάνω <i>paralamváno</i> 'pick up'	μου κακοφαίνεται <i>mu kakofénete</i> 'dissatisfy'	σκίζομαι <i>skízome</i> 'tear'
13	αηδιάζω <i>aidiázo</i> 'disgust'	αποκοιμίζω <i>apokimízo</i> 'drowse'	μου φαίνεται βαρύς <i>mu fénete barís</i> 'be too heavy'	λιώνω <i>lióno</i> 'melt'
14	τρομάζω <i>tromázo</i> 'frighten'	σώζω <i>sózo</i> 'rescue'	μου αρέσει <i>mu arési</i> 'appeal'	στραβώνω <i>stravóno</i> 'bend'
15	ενθουσιάζω <i>enthusiázo</i> 'enthuse'	εξαντλώ <i>eksantló</i> 'exhaust'	κόβομαι <i>kónome</i> 'be put off'	κολλάω <i>koláo</i> 'get stuck (key)'
16	ενθουσιάζω <i>enthusiázo</i> 'ravish'	καταστρέφω <i>katastréfo</i> 'ruin'	μου φαίνεται συγκινητικός <i>mu fénete siginitikós</i> 'affect'	σπάω <i>spáo</i> 'break'

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1 C. Hungarian

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

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3 D. Korean

	accusative		dative	
	experiencer	non-experiencer	experiencer	non-experiencer
1	귀찮게 하다 <i>kwichanhkey hata</i> ‘annoy’	방해하다 <i>panghayhata</i> ‘disrupt’	힘겹다 <i>himgyepta</i> ‘be too much’	날아오다 <i>nalaota</i> ‘come flying’
2	기쁘게 하다 <i>kippukey hata</i> ‘delight’	구원하다 <i>kwuwenhata</i> ‘rescue’	부담스럽다 <i>pwutamsulepta</i> ‘distress’	들어오다 <i>tuleota</i> ‘come in, get in’

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