A Quantitative Approach towards German Experiencer-Object Verbs

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Abstract

Despite being studied for several decades, the properties of experiencer-object (EO) verbs remain under discussion. This holds especially for the question whether they display distinctive properties that distinguish them from "regular" transitive verbs. We performed a large-scale annotation study of German EO verb syntactic distribution patterns which shows that EO verbs differ largely in how frequently they occur in the eponymous pattern, that verbs taken to belong to the same subclass can differ largely in their pattern distribution, and that the negative correlation between the number of occurrences on the reflexive pattern and the passive patterns is smaller than previously assumed. This means that a number of verbs considered "typical" for this verbal class appear to have stronger associations with syntactic patterns other than the prototypical one, which is of special importance for experimental work.

1 Introduction

Experiencer-object (EO) verbs are usually defined as psychological predicates whose experiencer is (normally) realised as the object. In most publications, the term psych verb is referring to verbs where one argument expresses the experiencer of some psychological state, cf. e.g. (Landau, 2010). The idea of a further classification in the domain of psych verbs dates back at least to Belletti and Rizzi (1988), whose division leads to the following three classes:[1]

(1) Belletti and Rizzi (1988)'s classes:
   I. *nominative experiencer, accusative stimulus*
   Mary fears John/the noise.
   II. *nominative stimulus, accusative experiencer*
   John/The noise frightens Mary.
   III. *nominative stimulus, dative experiencer*
   John/The book appeals to Mary.

The ability of the verbs belonging to class II or III to realise the experiencer in the object position ignited vivid discussions among researchers about its peculiar position in the verbal domain. While the above classification has been very influential, it resulted in a presumably premature focus on classes that may be too internally heterogeneous to allow a productive analysis of their members' properties. Particularly, these verbs are known for their variation in argument realisation patterns that call for a more fine-grained classification than currently presented. This requires an overview on the general distribution of syntactic occurrence profiles besides the prototypical experiencer-object pattern. These unresolved issues appear particularly problematic since many of these verbs are used in experimental syntax research without

[1] We depart from their terminology here. One may note that Belletti and Rizzi propose this distinction only for Italian and explicitly state that they do not take into account derivational processes.

further reflection on the classes that are presupposed or with a focus only on selected differences (cf. (Haupt et al., 2008; Verhoeven, 2015; Ellsiepen and Bader, 2018; Scheepers et al., 2000), among many others). It is also subject to debate if the larger category of psych verbs does in fact have distinctive properties compared to other verbs or if the psych-based constructions do not fundamentally differ from other transitive constructions (for the latter view, cf. e.g. (Grafmiller, 2013; Żychliński, 2016)). Psych verbs in general and EO psych verbs in particular have usually been approached with a specific syntactic pattern of realisation in mind. In the case of EO psych verbs, this pattern would be a subtype of a transitive construction where the role of the stimulus (STM) is assigned to the subject, and the role of the experiencer (EXP) is assigned to the object. But even superficial scrutiny soon reveals that *forms* of the respective verbs occur in other syntactic patterns. The semantics assigned to these patterns is sometimes transparently linked to the semantics of the "prototypical" pattern. In other cases, a link is much harder to detect, and in some cases, it appears quite opaque, even to the effect that a description of the verb as EO verb seems hard to defend. A large corpus-based resource on EO verb distribution patterns and their general frequency and distribution contributes to a quantitative perspective towards the phenomenon.

1.1 Why We Need a Large-Scaled Approach

While the possibility of the verbs' appearance in certain syntactic environments has played a prominent role in the literature on experiencer-object verbs for several decades (particularly their ability to passivise, cf. Belletti and Rizzi (1988), Pesetsky (1995), Landau (2010) among many others) and alternations between some realisation patterns have gained some prominence in the literature recently (cf. i.a. (Alexiadou and Iordăchioaia, 2014; Pijpops and Speelman, 2017; Hirsch, 2018; Rott et al., 2020)), we are not aware of a large-scaled corpus study investigating the syntactic distributional patterns of the posited class of experiencer-object psych verbs in German: Engelberg (2018) and Cosma and Engelberg (2014) look at 11 (German) verbs only, Becker and Guzmán Naranjo (2020) annotate 30 sentences for 12 "psych concepts" (in 7 languages), and Verhoeven (2015) performs annotations for 30 EO verbs, but she is interested in word order differences and does not aim to capture the whole syntactic distribution.
Given the large amount of candidate verbs in German, the need for a comprehensive data-driven approach and the fruitfulness of its ultimate results for theoretical work is evident, but it may also be used to improve experimental work (which was the original motivation for the annotation effort at hand): The observed large differences between verbs within broad classes like "accusative EO" suggest that one should not assume all its members to behave alike and that insights gained from testing a small number of verbs might not generalise to the whole assumed class. If one is interested in a specific pattern, a Reliance analysis (cf. Section 2.1) will help to find verbs that typically occur in it. Also, the annotations enable the search for sentences fulfilling specific criteria, which can – in a modified form – be used in experiments in turn, cf. the methodology of *modified stimulus composition* as described in (Börner et al., 2019).

Our findings based on a large-scaled corpus-based analysis strengthen the hypothesis that the often (implicitly) assumed homogeneity of a category like "accusative/dative EO verb" is not reflected in actual empirical behaviour. While some existing works argue to provide a subclassification of the psych verb domain (e.g. (Hirsch, 2018)), these works did not include strong corpus-linguistic aspects. Other corpus-based works (e.g. (Möller, 2015) on the past participle of German psych verbs) focused on a small number of syntactic phenomena and did not pursue a broader perspective.

1.2 Resource and Annotation Process

The basis of our annotation study are randomly extracted sentences from a corpus of the NZZ (*Neue Zürcher Zeitung*, volumes 1993-1999, cf. (Keßelmeier et al., 2009; NZZ, 1995 to 1999)). We chose 64 German EO verbs based on previous experimental and corpus studies (among others: (Rääts, 2011; Temme and Verhoeven, 2017; Hirsch, 2018; Engelberg, 2018)). To be included, the verb should be grammatically possible within a transitive EO-construction. We operationalised that by including verbs that are cited frequently as EO verbs in relevant publications or are clearly possible in such a construction by the intuition of all three (German native speaker) annotators. Semantically, the verb should display psych-predicate properties by clearly denoting an emotional or mental state or event. Both aspects are

commonly referred to as distinctive features of psych EO verbs in the literature (cf. (Landau, 2010) among many others). Further constraints on the data set were imposed by balancing on overall frequency, case preference, morphological variety, and perfect tense auxiliary selection preference. For each of the candidate verbs, up to 200 samples were randomly extracted from the NZZ corpus. Roughly one third of these 64 verbs did not yield complete samples of 200 sentences due to their low corpus frequencies (for all sample sizes, cf. Appendix A). The samples were divided among and annotated by three native speakers of German with respect to a variety of syntactic patterns, the animacy of the stimulus (if present), an eventual stimulus-indicating PP or other kind of stimulus adjunct, syntactic aspects like control and a number of other potentially relevant factors.

The annotated syntactic patterns include: prototypical EO-transitive (X-STM_V_Y-EXP), intransitive (X-STM_V) without a syntactically realised EXP, and Acc/Dat-EXP_V without a phoric subject, but with a dative or accusative EXP. We further annotated both the stative (sein_V-PII) and the eventive/verbal (werden_V-PII) passive, and reflexive variants, where the experiencer is the subject (X_V_refl). Other patterns include constructions based on the past/perfect participle[2] like refl_V-PII_zeigen ("to show oneself/feel V-ed"), wirken/scheinen_V-PII ("seem V-ed"), NoAux_V-PII (without an auxiliary), where the status as a verb is rather doubtful (the same applies to the stative passive), a kind of causative pattern (X-CAUS_V_Y-EXP_PP), the reflexive pattern + an additional genitive NP (X-EXP_V_refl_Gen-STM)[3], *let*-constructions with a reflexive (X_lassen_refl_V), and a pattern that looks similar to the reflexive one but uses ablaut instead of reflexivisation (Nom-EXP_V), as well as modal infinitives and embedding into the *tough*-construction.

After the first annotation stage was completed, each of the samples was revised by at least one further annotator in a subsequent adjudication step to decide on problematic cases. We did not consider a classic inter-annotator agreement calculation as fruitful in this case, but verified every annotation by at least a simple majority decision among the annotators. This resulted in a data set with a total of 10,290 annotated examples. All analyses and visualisations were performed in R (R Core Team, 2020) using the *tidyverse* (Wickham et al., 2019). The data and accompanying material is publicly available via `https://github.com/Linguistic-Data-Science-Lab/German_EO_verbs`. A comprehensive table containing the frequency data for all verbs and patterns can be found in Appendix A.

2 Results and Implications

As our data shows, the vast majority of the given verbs display a large variety of syntactic patterns. This syntactically promiscuous behaviour has been considered typical for psych verbs (cf. e.g. (Hirsch, 2018)). The present corpus-annotation proved the domain of these verbs even more syntactically heterogeneous than expected. We are aware that our approach is, by all means, a frequentist one, which entails that we have to face the well-known issues that come along with frequentist methods, e.g. that non-occurrence in a corpus does not prove ungrammaticality *per se*, and the actual distribution might be to some extent corpus-dependent. However, we assume that higher frequencies of a specific verb in a specific syntactic configuration do reflect some characteristics of a verb. Additionally, it *is* possible to find occurrences of specific verbs in specific patterns that they were hitherto thought to disallow (cf. Section 2.3).

2.1 The Prototypical EO-transitive Pattern

As the corpus study on the syntactic pattern distribution of EO verbs has shown, their behaviour is notably heterogeneous (cf. Section 2.2). If a number of verbs that are frequently cited as examples for a particular verb class defined with a certain argument pattern in mind and researched (using introspective or experimental methods) as exemplars of that class turn out to occur in this pattern only comparatively rarely, then this can be crucial for experimental work as well as theoretical reflections. This may happen regardless of the general grammaticality in the respective pattern, which is, in our case, the transitive EO

[2]PII in the pattern names (after its traditional German name *Partizip II* "participle II").

[3]Most of these constructions appear limited to a small number of the candidate verbs, constructions like EXP_V_refl_Gen-STM are arguably no longer productive in Modern Standard German, cf. (Hirsch, 2018).

pattern.

To quantify the relation between the verbal lemma and the target construction mostly associated with the psych-EO class, we calculated the overall Reliance measure (introduced by Schmid (2000), defined in equation 1) for each verb (excluding examples where the lemma clearly does not appear in its psych reading[4]) for the transitive EO pattern (with an overt object experiencer, as in (2)) as well as the "object drop" intransitive construction, where the experiencer argument is not represented syntactically but is semantically present (a kind of arbitrary experiencer), as in (3).

(2) (NZZ_1995_11_28_a97_seg3_s1)

Die Aura der Stararchitekten bezaubert neuerdings die Welt.
the.NOM aura.NOM the.GEN star.architects.GEN charms recently the.ACC world.ACC

The aura of star architects recently charms the whole world.

(3) (NZZ_1994_08_24_a85_seg3_s10)

Die musikalischen Leistungen imponierten fast durchweg.
the.NOM musical.NOM achievements.NOM impressed almost the.entire.time

The musical achievements impressed almost consistently.

The association measure Reliance mirrors to what extent a certain lexeme (dis-)prefers a certain syntactic slot, calculated by the number of occurrences in a given construction (l_c) divided by the number of all occurrences of the lexeme, i.e. the sum of l_c and the number of observed occurrences in other constructions, $l_{\neg c}$.

$$R = \frac{l_c}{l_c + l_{\neg c}} \tag{1}$$

Figure 1 displays the Reliance for all verbs on the transitive (in black) and the intransitive (in grey) pattern, higher scores entailing a higher preference for the given construction. It strikes us as surprising that – while some verbs display a strong preference for the transitive EO pattern – particularly a number of verbs frequently used and analysed in works about the syntactic characteristics of EO verbs (e.g. (Verhoeven, 2014; Temme, 2018)) display a relatively low (or mediocre) Reliance score regarding the transitive pattern (with an overt experiencer object). This particularly holds for *verwundern* "to astonish", *verängstigen* "to frighten", *deprimieren* "to depress", *begeistern* "to thrill, enthuse", and *ausreichen* "to suffice", as well as for a number of other verbs, namely *interessieren* "to interest", *freuen* "to be glad", *empören* "to outrage", *amüsieren* "to amuse", *ekeln* "to disgust", *erfreuen* "to enjoy, delight", *langweilen* "to bore", where we find a pattern alternation with the reflexive construction (cf. Figure 2).

2.2 The Reflexive Pattern and its Relation to the Passive

This reflexive pattern is employed by some accusative[5] EO verbs. Here, the experiencer is realised in the subject position and the verb is reflexivised. The stimulus may be dropped entirely or be realised in a PP (the factors determining which preposition is used are still unclear although most verbs (heavily) favour one preposition). In the case of clausal stimuli, a pronominal adverb is used frequently (as in (5)).

(4) (NZZ_1995_08_15_a122_seg6_s3)

Man amüsiert sich über Tinguelys Sinn für Satire und Ironie.
one.NOM amuses REFL about Tinguely's sense.ACC for satire.ACC and irony.ACC

One is amused by Tinguely's sense of satire and irony.

[4]We have also identified a number of occurrences that can be considered "psych ambiguous" due to an ambiguity or vagueness of the verb between a mental state and a non-mental state meaning (an example is *schwerfallen* "to be/feel difficult"). For the Reliance analysis, both unambiguously psych and psych ambiguous examples were included, while unambiguously non-psych occurrences were not considered.

[5]*Gefallen* "to like" is a dative EO verb that has a reflexive variant (and is listed in Figure 2 accordingly) but its meaning in the reflexive variant is somewhat different from the one on the EO pattern and we probably have to deal with a different phenomenon here.

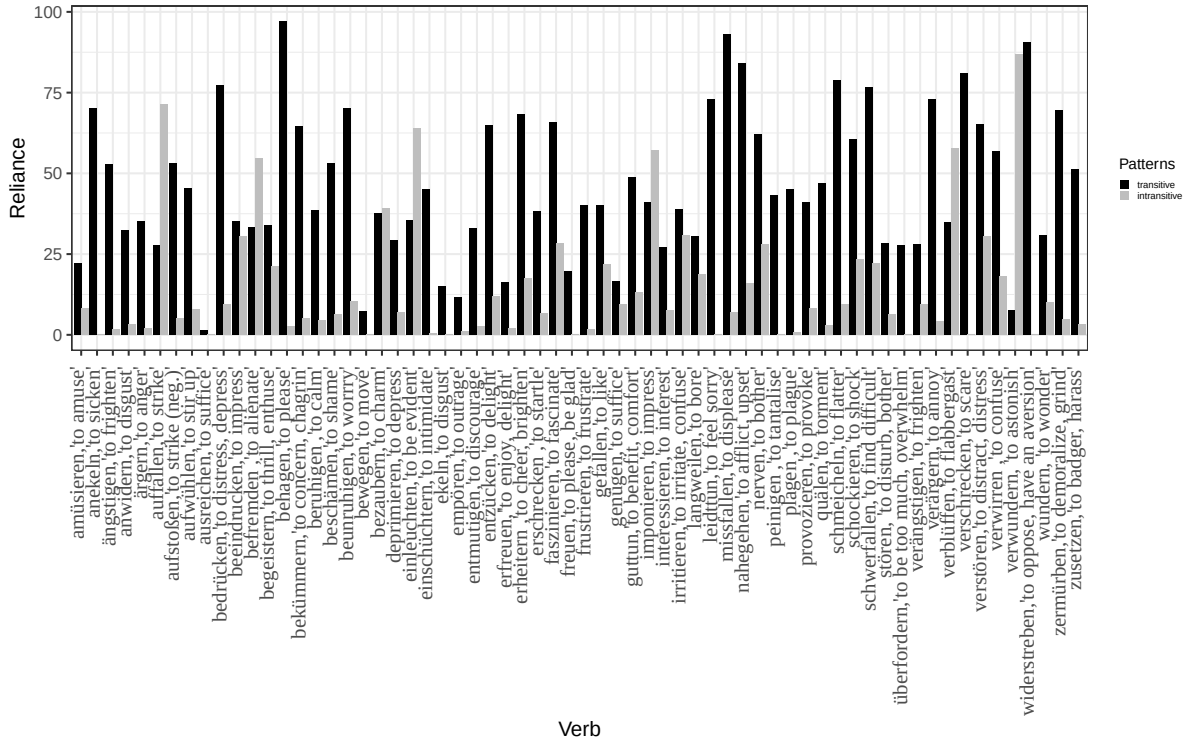

Figure 1: Reliance measure transitive and intransitive patterns

(5) (NZZ_1994_12_16_a188_seg29_s25)

23.00 Ich freue mich, dass du geboren bist.
23.00 I.NOM am.glad REFL that you.NOM born are

23.00 I'm glad you were born.

Engelberg (2018, pp. 61–65) observes that the experiencer subject variant is used far more often than the experiencer-object variant in verbs that allow for it, and asserts a negative correlation between the number of examples in the experiencer subject variant and the number of (eventive or stative) passive sentences (with a correlation coefficient of -0.64, compared to a correlation coefficient of +0.59 between passive sentences and EO sentences) (Engelberg, 2018, p. 64). He speculates that both patterns compete because they serve the same function with regard to information structure, namely allowing the experiencer to be realised in the position typically occupied by topics.[6] While we observe a correlation in our data, it is not nearly as strong as in Engelberg's. This is due to the fact that the verbs from his study (*amüsieren*, "to amuse", *ärgern* "to anger", *aufregen* "to upset" (not in our data), *freuen* "to please, be glad", *interessieren* "to interest", and *wundern* "to wonder") are among the ones employing the reflexive pattern most frequently (cf. Figure 2). This shifted perspective sheds light on the need for larger groups of test verbs.

As illustrated by Figure 2, some verbs, although allowing the pattern, occur in the reflexive pattern much less frequently than others. Furthermore, some verbs occur in the passive as well as in the reflexive pattern, and we observe differences between the eventive (*werden*) and the stative (*sein*) passive. If we consider only the patterns on psych usages of the verbs, we find a negative correlation of -0.12 between the reflexive pattern and both passive variants combined, -0.14 between reflexive and *werden* passive, and -0.06 between reflexive and *sein* passive. While it is possible that both patterns are employed to achieve certain configurations meeting the speaker's information-structural desires, we would not overestimate

[6]One should note that one would expect a third competitor due to the flexible German word order, namely simply putting the experiencer in topic position on the EO pattern. Word order with psych verbs in German is a complex topic though that we cannot delve into here.

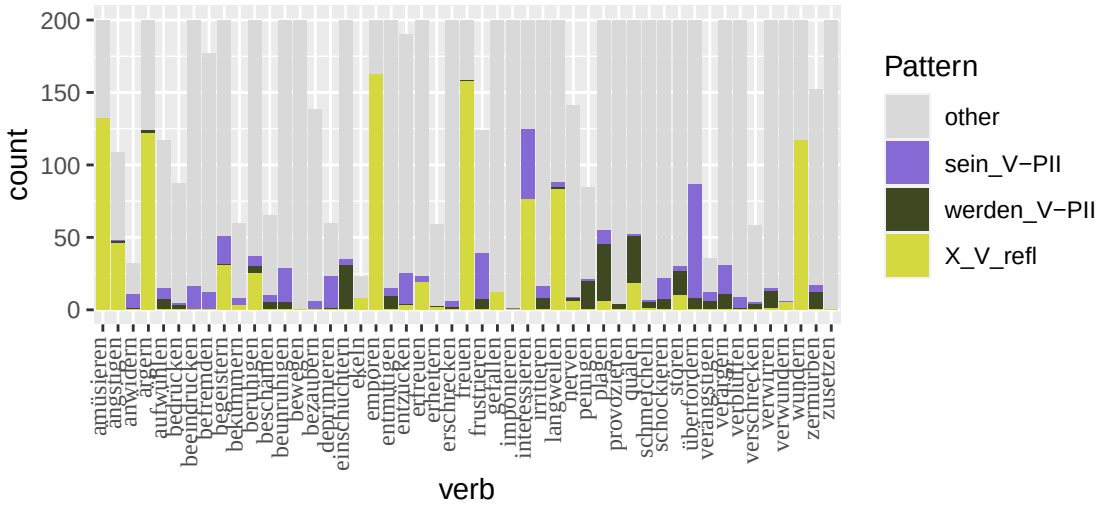

Figure 2: Co-occurrences of passive and reflexive constructions (only verbs occurring at least once in one of them)

this. Rather, we suspect that independent factors are responsible for the (un-)availability of the patterns – which is not to say that there is no (indirect) connection between them.

2.3 Variation among Subclasses

While a discussion of all interesting differences between the verbs would be far beyond the scope of this paper, we illustrate some pattern distribution variation in Figure 3. All of the verbs are accusative EO verbs and could thus naively be considered to fall into the same class. They all occur both within the

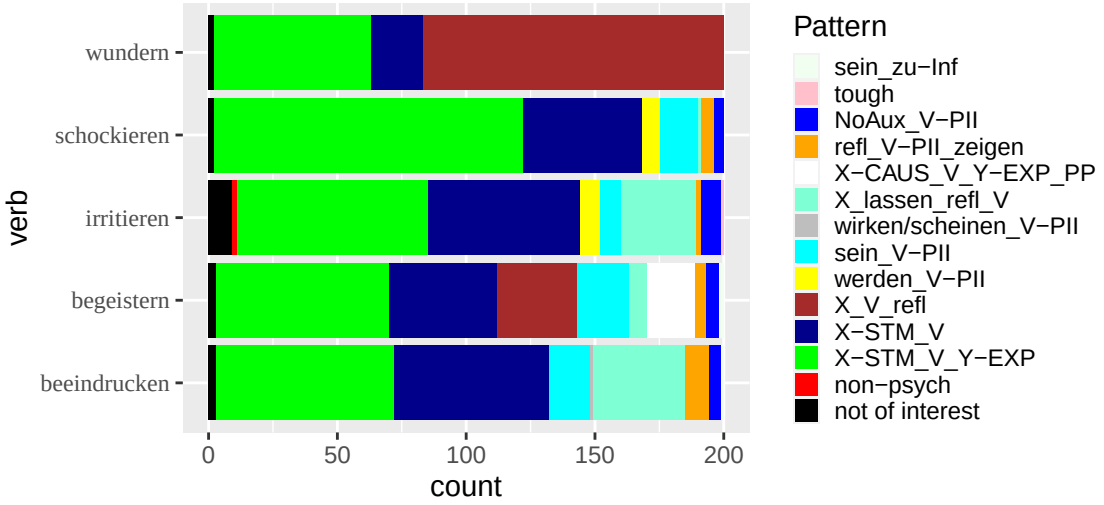

Figure 3: Pattern distribution for selected acc-verbs

transitive and the intransitive pattern. This is intriguing because it poses a challenge for all accounts of accusative EO verbs that do not take the experiencers to be "real" objects since, in German, so-called object-drop (which is what happens with our intransitive pattern) is only considered possible with "real" objects in the literature (cf. (Hirsch, 2018, pp. 163–165)).[7] While *wundern* "to wonder" only occurs in three patterns and is dominated by the reflexive pattern, the other verbs are much more flexible although

[7]Hirsch himself argues based on introspective judgements that a subclass of accusative EO verbs containing *wundern* "to wonder" does in fact not allow it.

only *begeistern* "to thrill, enthuse" also displays the reflexive pattern. It is also one of only two verbs in the data set to showcase the construction we call X-CAUSE_V_Y-EXP_PP, where semantically the subject referent causes the experiencer (realised as the object) to be in the psychological state expressed by the verb towards an object of emotion, which is realised in a PP (cf. (6)).[8]

(6) Der Professor begeisterte seine Studenten für die Linguistik.
the.NOM professor.NOM enthused his.ACC students.ACC for the.ACC linguistics.ACC
The professor made his students get excited about linguistics.

Only *schockieren* "to shock" and *irritieren* "to irritate, confuse" occur in the eventive/verbal passive (werden_V-PII).

3 Conclusion and Further Perspectives

The assumed class of EO verbs and their realisation patterns remain a complex matter. Certain assumptions about verbs considered EO do not appear to hold from a larger-scaled quantitative perspective. This also affects the subclasses proposed on the basis of case preferences. It is also notable that a number of verbs that are considered "typical" for this verbal class (despite its debated heterogeneity and unresolved classification approaches) appear to have a strong association with syntactic patterns other than the prototypical one, e.g. the reflexive construction, which might particularly affect experimental research. We consider both the quantitative perspective as well as a gold-standard annotated resource of sufficient scope as necessary for further research on the issue, particularly in the domain of experimental and theoretical linguistics.

Acknowledgements

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[8] We only subsume examples with the semantics specified above under this label. Examples with e.g. a resultative PP do not fall under it. An anonymous reviewer remarks that other verbs might allow this pattern as well and it might be due to the limited number of occurrences we looked at that we did not find them. This is, of course, true and – as (i) shows – it is possible to construct such examples for *faszinieren* "to fascinate".

(i) Der Professor faszinierte seine Studenten für die Linguistik.
the.NOM professor.NOM fascinated his.ACC students.ACC for the.ACC linguistics.ACC
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Appendix A: Pattern Distribution

Verb	translation	case EXP	X-STM_V_Y-EXP	X-STM_V	X_V_refl	werden_V-PII	sein_V-PII	wirken/scheinen_V-PII	X_lassen_refl_V	X-CAUS_V_Y-EXP_PP	refl_V-PII_zeigen	Nom-EXP_V	NoAux_V-PII	EXP_V_refl_Gen-STM	Acc/Dat-EXP_V	*tough*	sein_zu-Inf	(non-amb.) non-psych	not of interest	Sample size
amüsieren	amuse	a	43	16	132	0	0	0	0	0	0	0	4	0	0	0	0	0	5	200
anekeln	sicken	a	14	0	0	0	0	0	0	0	1	0	4	0	1	0	0	0	0	20
ängstigen	frighten	a	57	2	46	1	1	0	1	0	0	0	0	0	0	0	0	0	1	109
anwidern	disgust	a	10	1	0	1	10	0	0	0	3	0	6	0	0	0	0	0	1	32
ärgern	anger	a	69	4	122	2	0	0	0	0	0	0	0	0	0	0	0	0	3	200
auffallen	strike	d	55	142	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	200
aufstoßen	strike (neg.)	d	105	10	0	0	0	0	0	0	0	0	0	0	0	0	0	83	2	200
aufwühlen	stir up	a	48	9	0	7	8	1	0	0	2	0	9	0	0	1	0	30	2	117
ausreichen	suffice	d	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	193	5	200
bedrücken	distress, depress	a	62	8	0	3	2	1	0	0	0	0	1	0	0	0	0	7	3	87
beeindrucken	impress	a	69	60	0	0	16	1	36	0	9	0	5	0	0	0	1	0	3	200
befremden	alienate	a	58	95	0	0	12	0	0	0	4	0	5	0	0	0	0	0	3	177
begeistern	thrill, enthuse	a	67	42	31	0	20	0	7	19	4	0	5	0	0	0	2	0	3	200
behagen	please	d	193	5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	200
bekümmern	concern, chagrin	a	38	3	3	0	5	0	0	0	1	0	4	0	0	0	0	5	1	60
beruhigen	calm	a	74	9	25	5	7	0	2	0	0	0	5	0	0	0	1	71	1	200
beschämen	shame	a	33	4	0	5	5	0	1	0	1	0	13	0	0	0	0	0	3	65
beunruhigen	worrry	a	137	20	0	5	24	1	3	0	1	0	4	0	0	0	0	0	5	200
bewegen	move	a	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	125	64	200
bezaubern	charm	a	50	52	0	0	6	0	21	0	0	0	4	0	0	0	0	0	5	138
deprimieren	depress	a	17	4	0	1	22	3	2	0	1	0	7	0	0	1	0	0	2	60
einleuchten	be evident	d	70	126	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	200
einschüchtern	intimide	a	88	1	0	31	4	1	56	0	0	0	8	0	0	2	5	0	4	200
ekeln	disgust	a	3	0	8	0	0	0	0	0	0	0	0	0	4	0	0	5	3	23
empören	outrage	a	22	2	163	0	0	0	0	0	0	0	0	0	0	0	0	0	13	200
entmutigen	discourage	a	65	5	0	9	6	1	91	0	1	0	15	0	0	0	0	4	3	200
entzücken	delight	a	120	22	3	1	21	0	1	0	4	0	13	0	0	0	0	0	5	190
erfreuen	enjoy, delight	a	32	4	19	0	4	0	0	0	3	0	0	133	0	0	0	3	2	200

Verb	translation	case EXP	X-STM_V_Y-EXP	X-STM_V	X_V_refl	werden_V-PII	sein_V-PII	wirken/scheinen_V-PII	X_lassen_refl_V	X-CAUS_V_Y-EXP_PP	refl_V-PII_zeigen	Nom-EXP_V	NoAux_V-PII	EXP_V_refl_Gen-STM	Acc/Dat-EXP_V	*tough*	sein_zu-Inf	(non-amb.) non-psych	not of interest	Sample size
erheitern	cheer, brighten	a	39	10	2	0	0	0	3	0	0	0	2	0	0	1	0	0	2	59
erschrecken	startle	a	74	13	0	2	4	1	4	0	0	91	3	0	0	0	1	0	7	200
faszinieren	fascinate	a	125	54	0	0	0	0	11	0	0	0	0	0	0	0	0	0	10	200
freuen	please, be glad	a	39	0	158	0	0	0	0	0	0	0	0	1	0	0	0	0	2	200
frustrieren	frustrate	a	48	2	0	7	32	1	3	0	8	0	19	0	0	0	0	0	4	124
gefallen	like	d	73	40	12	0	0	0	0	0	0	0	0	0	7	0	0	50	18	200
genügen	suffice	d	23	8	0	0	0	0	0	0	0	0	0	0	0	0	0	161	8	200
guttun	benefit, comfort	d	46	17	0	0	0	0	0	0	0	0	0	0	0	0	0	111	26	200
imponieren	impress	d	79	110	0	0	1	0	3	0	0	0	0	0	0	0	0	0	7	200
interessieren	interest	a	54	15	76	0	49	0	0	1	3	0	1	0	0	0	0	0	1	200
irritieren	irritate, confuse	a	74	59	0	8	8	0	29	0	2	0	8	0	0	1	0	2	9	200
langweilen	bore	a	59	36	83	2	3	1	0	0	1	0	8	0	0	0	0	0	7	200
leidttun	feel sorry	d	139	0	0	0	0	0	0	0	0	0	0	0	52	0	0	0	9	200
missfallen	displease	d	177	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	200
nahegehen	afflict, upset	d	21	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	29
nerven	bother	a	80	36	6	2	1	0	0	0	0	0	4	0	0	0	0	0	12	141
peinigen	tantalise	a	31	0	0	20	1	0	2	0	0	0	18	0	0	0	0	0	13	85
plagen	plague	a	71	1	6	39	10	0	1	0	0	0	28	0	0	0	0	2	42	200
provozieren	provoke	a	77	16	0	4	0	0	3	0	0	0	0	0	0	0	0	97	3	200
quälen	torment	a	93	6	18	33	1	3	1	0	0	0	4	0	0	0	0	39	2	200
schmeicheln	flatter	d	155	17	1	4	2	0	1	0	6	0	2	0	0	0	0	11	1	200
schockieren	shock	a	120	46	0	7	15	0	1	0	5	0	4	0	0	0	0	0	2	200
schwerfallen	find difficult	d	67	14	0	0	0	0	0	0	0	0	0	0	0	0	0	108	11	200
stören	disturb, bother	a	49	12	10	17	3	0	4	0	2	0	0	0	0	0	0	90	13	200
überfordern	be too much, overwhelm	a	53	0	0	8	79	4	0	0	5	0	6	0	0	0	0	40	5	200
verängstigen	frighten	a	9	3	0	6	6	0	0	0	0	0	8	0	0	0	0	0	4	36
verärgern	annoy	a	140	8	0	11	20	0	0	0	3	0	10	0	0	0	0	0	8	200
verblüffen	flabbergast	a	68	113	0	1	8	0	0	0	1	0	5	0	0	0	0	0	4	200

Verb	translation	case EXP	X-STM_V_Y-EXP	X-STM_V	X_V_refl	werden_V-PII	sein_V-PII	wirken/scheinen_V-PII	X_lassen_refl_V	X-CAUS_V_Y-EXP_PP	refl_V-PII_zeigen	Nom-EXP_V	NoAux_V-PII	EXP_V_refl_Gen-STM	Acc/Dat-EXP_V	*tough*	sein_zu-Inf	(non-amb.) non-psych	not of interest	Sample size
verschrecken	scare	a	47	0	0	4	1	0	0	0	1	0	5	0	0	0	0	0	0	58
verstören	distract, distress	a	32	15	0	0	0	0	1	0	0	0	0	0	0	0	0	1	3	52
verwirren	confuse	a	105	34	1	12	2	0	8	0	0	0	4	0	0	1	0	20	13	200
verwundern	astonish	a	15	174	5	0	1	0	0	0	0	0	4	0	0	0	1	0	0	200
widerstreben	oppose, have an aversion	d	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	2	76
wundern	wonder	a	61	20	117	0	0	0	0	0	0	0	0	0	0	0	0	0	2	200
zermürben	demoralize, grind	a	100	7	0	12	5	0	4	0	0	0	17	0	0	0	0	3	4	152
zusetzen	badger, harass	d	86	3	0	1	0	0	0	0	0	0	0	0	0	0	0	101	9	200

Table 1: Pattern distribution and sample size for each verb