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Backward binding as a psych effect: A binding illusion?

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Abstract: Bound anaphors inside subjects challenge the c-command requirement for binding. At least in some languages, experiencer-object verbs such as *worry* or *please* are reported to license this type of backward dependence. In many cases, the underlying facts are based on unstable intuitions potentially influenced by intervening factors, such as accidental coreference and binding illusions. This article reports the results of an experiment on backward binding with accusative and dative experiencer-object verbs in German; in this experiment, crucial sources of variation are controlled. The results show that verb class (experiencer-object vs. agentive) has a significant effect on variable binding, both for dative and for accusative verbs. This result cannot be accounted for through accidental coreference and is not reducible to effects of sentence aspect, the latter being correlated with the distinction between experiencer-object and agentive verbs. These findings are evidence for backward binding as a genuine psych effect in German.

Keywords: psych verbs, backward binding, acceptability, pronominal binding, agentivity, genericity

1 Introduction

Backward binding (henceforth BB) is argued to belong to the special properties of experiencer-object (EO) verbs in several languages. Anaphors inside non-derived subjects are banned by Principle A of Binding Theory, which states that proper binding requires c-command (Reinhart 1976; Reinhardt 1983; Chomsky 1980; Chomsky 1981). However, EO verbs seem to license such structures in unlike the canonical transitive action verbs; compare (1a) and (1b).

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(1) a. *His*$_i$ *health worries every patient*$_i$.
b. **His*$_i$ *doctor visited every patient*$_i$.
(Reinhart 2002: 256)

BB as a psych effect has been widely discussed in theoretical literature, such as Postal (1971), Giorgi (1984), Pesetsky (1987, 1995), Belletti and Rizzi (1988), Broccias (1997), Cançado and Franchi (1999), Reinhart (2001), Sato and Kishida (2009), Platzack (2009) and Landau (2010), among many others. Most researchers derive BB effects under preservation of Binding Principle A, assuming that the exceptional binding reflects the special lexical-semantic and syntactic properties of EO verbs. Section 2 shortly reviews the analyses of psych effects in general, and BB in particular.

BB may arise through configurations that allow for coindexing without c-command requirements. BB data across the literature involves anaphors that are analyzed as exempt from Binding Theory (BT). Furthermore, even in regular cases, such as in variable binding configurations, the effect may stem from a binding illusion induced by implicit operators. These phenomena are discussed in Section 3, which establishes the empirical requirements in order to test the possibility of genuine instances of BB in German.

The phenomena at issue involve sources of variation that is partly reflected in controversial judgments reported in the literature. Hence, in order to clarify the evidential basis of the relevant facts, we need empirical designs that control the sources of variation. Some psych effects have been confirmed by means of experimental studies and corpus evidence, e.g., for psych effects on word order see the corpus studies of Bader and Häussler (2010a) and Verhoeven (2015) and the production studies in Lamers (2012), Lamers and de Hoop (2014), and Verhoeven (2014); for cross-linguistic evidence based on acceptability judgments see Temme and Verhoeven (2016). Although there are some experimental findings based on preference and acceptability of binding and coreference data in general (Hirschberg and Ward 1991; Gordon and Hendrick 1997; Asudeh and Keller 2001; Carminati et al. 2002; Goldwater and Runner 2006), to the best of our knowledge, there is no experimental research of BB as a psych effect. Filling this lacuna, we present two separate experiments on BB in German; one with accusative, and one with dative experiencer verbs. Section 4 presents the experimental material and method. In Sections 5 and 6, the experimental results are presented and discussed, followed by concluding remarks in Section 7.

2 Backward Binding as a psych effect

It has been claimed that verbs selecting nominative stimuli and accusative experiencers ('X_{STIM} *annoys* Y_{EXP}', 'X_{STIM} *pleases* Y_{EXP}'; see examples in [2]) or dative experiencers ('X_{STIM} *appeals to* Y_{EXP}', 'X_{STIM} *matters to* Y_{EXP}'; see examples in [3]) license bound reflexives and reciprocals embedded inside the stimulus subject. Although the structures in (2)–(3) do not warrant a c-command relation between the coindexed antecedent and anaphor, they are reported to be grammatical.

(2) a. *Pictures of each other$_i$ annoy the politicians$_i$.*
b. *Stories about herself$_i$ generally please Mary$_i$.*
(Pesetsky 1987: 127)

(3) a. *Each other$_i$'s remarks appealed to* [*John and Mary*]$_i$.
b. *Each other$_i$'s welfare mattered to the students$_i$.*
(Pesetsky 1995: 53)[1]

The BB effect shown in (2)–(3) is taken as evidence for a special status of experiencer objects in contrast to patient or theme objects (cf. 'X_{AG} visits Y_{PAT}', 'X_{AG} hugs Y_{PAT}' or 'X_{EXP} loves Y_{TH}'). Since, as a rule, subjects are canonical binders, experiencer objects have been analyzed as either underlying or covert subjects in order to account for this behavior. According to Belletti and Rizzi (1988) and Pesetsky (1995), the status of surface experiencer objects as deep structural subjects enables them to c-command and bind their anaphors at a pre-derivational level. Campbell and Martin (1989), Endo (2007), and Sato and Kishida (2009) assume a covert movement of the object experiencer to a designated position from which it c-commands the relevant bindee. However, several sources of variation challenge the generalizability of psych properties. Dative experiencers generally show stronger psych effects than accusative experiencers. For languages such as German and Dutch, this intuition has been supported by empirical findings on experiencer-first effects in Kempen and Harbusch (2003), Haupt et al. (2008), Bader and Häussler (2010a), Lamers and de Hoop (2014), Lamers and de Schepper (2010), and Verhoeven (2015).

Another type of variation is accusative EO verbs, which appear in different aspectual structures. Arad (1998a) shows that EO verbs may have agentive (4a), eventive (4b), and stative (4c) interpretations, depending on the lexical aspect

1 Not all native speakers of English share these judgments. An anonymous reviewer, for example, rejects the acceptability of examples such as (3).

of the verb, as well as on properties of the arguments (only animate stimuli may be involved in an agentive reading). This observation is relevant since only non-agentive EO structures exhibit psych effects (cf. Arad 1998a; Landau 2010; Verhoeven 2010).

(4) a. *Nina frightened Laura deliberately/to make her go away*.
b. *Nina frightened Laura unintentionally/accidentally.*
c. *John's behaviour/nuclear war frightened Nina*.
(Arad 1998a: 3–4)

Furthermore, within the class of non-agentive structures, the type of subject is critical to the emergence of psych effects (see Reinhart 2001). To be more precise, only EO structures containing subject matter subjects are claimed to license BB, whereas causer subjects block this option, as shown by the contrast in (5). In (5a) the worries are *about* the health, whereas in (5b) the letter *causes* the worries (which then are *about* something else). Consequently, only a subset of nominative arguments of non-agentive EO verbs, namely subject matter subjects, originates as internal arguments.

(5) a. *His*$_i$ *health worried every patient*$_i$.
b. ??*His*$_i$ *doctor's letter worried every patient*$_i$.
(Reinhart 2002: 271)

The insights into the sources of variation suggest that BB is an option only for a subset of the occurrences of EO verbs, restricted by the verbal aspect and the subject role. These restrictions raise the question of whether the exceptional effects are a really genuine property of EO verbs, or whether they mirror the aspectual and/or thematic properties that frequently accompany these verbs. In this vein, some accounts cast doubt on the relevance of BB to the structural analysis of EO verbs (Bouchard 1995; Arad 1998b; Cançado and Franchi 1999; Landau 2010). This view is supported from the observation that BB is also licensed in structures that do not contain psych verbs, such as the periphrastic causative structures in (6) or the examples in (7). The unaccusative analysis, i.e., an analysis in which the anaphor-containing phrase originates in an internal argument, is rather unlikely with these examples (see Campbell and Martin 1989; Bouchard 1995; Pesetsky 1995). For instance, the binding relations in (6b) and (7b) cannot be reconstructed, even under a derived subject analysis. Rather, the reflexive in these structures must be licensed by independent factors (see Section 3.2).

(6) a. *News items about herself$_i$ generally make Sue$_i$ laugh.*
(Campbell and Martin 1989: 45)
b. *The picture of herself$_i$ on the front page of the Times made Mary$_i$'s claim seem somewhat ridiculous.*
(Pollard and Sag 1992: 20)

(7) a. ?*These stories about himself$_i$ don't describe John$_i$ very well.*
(Bouchard 1995: 296)
b. *These nasty stories about himself$_i$ broke John$_i$'s resistance.*
(Bouchard 1995: 296; Landau 2010: 73)

Next to the variation in BB emerging with different verb classes and EO structure types, some authors have pointed to cross-linguistic differences. Whereas EO-related BB has been argued to exist in English, Italian (Belletti and Rizzi 1988), Hungarian (È. Kiss 2002; Rákosi 2006; Rákosi 2015), and Chinese (Cheung and Larson 2015), V2 languages such as German, Icelandic, Swedish and Norwegian are claimed to be restricted with respect to exceptional binding in the psych-domain (Ottósson 1991; Broccias 1997; Platzack 2009; Kiss 2012). Following Ottósson (1991) and Platzack (2009), the basic syntactic configuration (VP- vs. CP-syntax) prevents BB in these languages. However, these are strong claims about the relevance of language-specific characteristics that require stronger certainty about the BB data in general.[2] As far as we know, with the exception of Kiss (2012), there is no in-depth discussion of BB as a psych effect in German and there is no experimental testing; and with the current state, there would be no reason to expect any blocking effects, as German shares all the relevant structural properties that should allow for BB.

In sum, BB is predicted to occur with a subclass of EO verbs, namely those verbs that are stative and take subject matter stimuli (Reinhart 2002). The question is whether the possibility of BB is a property of this class of verbs (under particular thematic/aspectual restrictions) or an artifact of more general pragmatic principles that apply with this verb class, due to preferences in their aspectual interpretation (Bouchard 1995; Arad 1998b). Since the reported judgments of the phenomenon vary considerably both between different constructions and between languages (sometimes even between speakers, see comment on example [3]), we need replicable data that control the crucial sources of variation in order to adequately evaluate the possibility of BB with EO verbs.

2 Note that the assumed ungrammaticality of at least some of the BB examples discussed in Platzack (2009) has received an alternative explanation by the fact that the reflexives are not exempt from BT in the respective languages, as e.g. argued in Kiss (2012) for German (see also Section 3.2).

3 Backward binding as a binding illusion

In the previous section, we discussed cases in which the coreference of an anaphor and its antecedent under a backward relation seems to be licensed independently from the special structural properties of EO verbs. Such binding illusions[3] find valid explanations outside the established c-command relation. The sources of illusionary binding are diverse. After setting up the empirical requirements for proper binding in Section 3.1, we will focus on two relevant sources of illusionary binding: First, logophoric interpretations of anaphors within picture NPs may give rise to binding illusions (Section 3.2); second, generic readings induced by structure-specific implicit event quantification potentially interfere with underlying pronominal binding configurations (Section 3.3). These issues are crucial for the design of the experiment presented in the subsequent sections.

3.1 Proper binding vs. coreference

Regular binding involves two NPs in an anaphoric relationship at sentence-level. Principles A and B of Binding Theory (BT) indicate that the bound and coreferential status of a pronoun depends on the pronoun type itself, i.e., anaphor vs. pronominal, but also on the type of the binder. In the following, we discuss the two basic configurations that qualify for proper binding, i.e., reflexive binding and variable binding.

True anaphors are fully dependent elements, such as reflexives ('himself') and reciprocals ('each other'). According to Binding Principle A of BT, they must be bound to an antecedent-NP within their binding domain in order to receive an interpretation; see (8) and (9) for reflexive and reciprocal anaphors, respectively. BT's Principle B addresses pronouns, which, by contrast, may not be bound inside the relevant domain; see (10).

(8) a. *Peter*$_{\text{i}}$ *saw himself*$_{\text{i}}$ *in the mirror*.
b. **Mary*$_{\text{i}}$ *saw himself*$_{\text{j}}$ *in the mirror*.

(9) a. [*Peter and John*]$_{\text{i}}$ *saw each other*$_{i}$ *in the mirror*.
b. **Peter*$_{\text{i}}$ *saw each other*$_{\text{j}}$ *in the mirror*.

3 We use the notion of binding illusion for situations where an anaphoric relation between a reflexive/pronominal variable and its antecedent is established without the syntactic and/or semantic conditions of binding being fulfilled.

(10) *Peter*$_{i}$ *saw him*$_{*i/j}$ *in the mirror*.

Many pronouns occupy an intermediate position between the pronominal and the reflexive use: possessive pronouns can be interpreted as both coindexed and coreferential with some antecedent-NP outside its binding domain, or coindexed with an antecedent inside the clause; see (11).

(11) *Peter*$_{i}$ *saw his*$_{i/j}$ *friend in the mirror*.

However, in order to obtain pronominal binding with requirements parallel to anaphoric binding of reflexives, the pronoun must be coindexed with a quantifier phrase (QP). Quantifiers semantically bind coindexed variables that are located within their scope. A key characteristic of coreferentiality is that the coindexed pronoun in (12a) can simply be replaced by *John*. This does not hold true for the pronoun in (12b). In this bound-variable configuration, the interpretation of the coindexed pronoun fully depends on the interpretation of the quantifier.

(12) a. *John*$_{i}$ said that *he*$_{i}$ was okay.
b. *No woman*$_{i}$ doubts that *she*$_{i}$ is okay.
(Büring 2005: 81)

In sum, the two configurations summarized in (13) are the only reliable binding relations between two NPs. Also, bindees such as in (13a) seem to be the only non-ambiguous option to evaluate structures under bound readings, as the pronominals in (13b) always allow for coreference outside their clause.

(13) a. Reflexive binding: An NP c-commanding a coindexed reflexive/reciprocal anaphor
b. Variable binding: A QP c-commanding a coindexed pronominal/variable

3.2 Picture NP anaphors

Accounts that reject BB as a psych effect assume that it can be subsumed under well-known phenomena involving BT-exemption. Recall the examples in (6) and (7), which cannot be explained with a derived subject analysis. These examples contain reflexive/reciprocal anaphors embedded in so-called *picture NPs*. Picture NPs are headed by a nominal referring to a representation of an individual, e.g., *picture of sb.*, *story about sb.* or *remark about sb.* Picture-NP

anaphors may relate to a referent salient in discourse (e.g., the point of view), in which case they behave like logophoric pronouns. That is the coreference is not established by the structural dependencies in the clause. Moreover, in languages such as English coreference under logophoric dependencies is also possible across clausal boundaries. This *long-distance binding* violates the domain requirements of binding relations (Pollard and Sag 1992). Examples containing these anaphors are exempt from Binding Theory and do not represent the required anaphoric type for proper binding (Reinhart and Reuland 1993; see also further examples in Pollard and Sag 1992). Following these considerations, picture-NP anaphors and logophoric reflexives are in general not suitable to test BB as a psych effect due to their potential exemptness from binding requirements (Bouchard 1995; Cançado and Franchi 1999; Landau 2010).

In contrast to English, German dismisses exempt reflexives; see Kiss (2012). As a consequence, picture-NP reflexives are argued to be ungrammatical inside subjects of EO psych verbs, leading to the conclusion that BB is unavailable with EO psych-verbs in German (Kiss 2012); see the anaphor-initial (14a) and antecedent-initial (14b) versions of German dative EO structures, as judged in Kiss (2012).

(14) a. **Die Bilder von sich$_i$ gefielen den Kindern$_i$.*
the pictures of themselves pleased the children

b. **Den Kindern$_i$ gefielen die Bilder von sich$_i$.*
the children pleased the pictures of themselves
(Kiss 2012: 161)

German picture-NP reflexives are informative for BB, as they exclude an antecedent outside the clause. However, acceptability of these structures is not uncontroversial. For example, the judgment of (14b) has been disputed by other authors (see Fischer 2015). A further problem (that may be crucial for an experimental manipulation) is the influence of a potential possessive vs. representational reading of these structures. In German, picture-NP reflexives are not suitable for encoding possessive relations whenever a possessive pronoun can be used instead (e.g., ??*die Möbel von sich* 'furniture of himself'). This may account for the ungrammaticality of (14b). These properties associated with picture-NP reflexives might overwrite a potential psych-related BB.

3.3 Event quantification

BB appears with EO verbs under particular aspectual conditions. It is worth examining the possibility that the aspectual properties interfere with some gen-

eral properties of event quantification known to affect binding. A source of binding illusions is the influence of event genericity on the interpretation of pronouns (Fox and Sauerland 1996).[4] As illustrated in (15a), a violation of the c-command requirement in bound-variable configurations leads to a Weak Crossover (WCO) effect: the grammaticality is compromised when the quantificational antecedent crosses the anaphoric pronoun at LF. This violation is absent in (15b), even though it would be predicted that quantifier raising leads to the same effect.

(15) a. ??*Last year, her*$_i$ *thesis year was the hardest for every student*$_i$.
b. *Her*$_i$ *thesis year is the hardest for every student*$_i$.
(Fox and Sauerland 1996: ex. 32)

According to Fox and Sauerland (1996), the well-formedness of (15b) is triggered by an implicit genericity operator that portions the world into relevant singular situations, such that the pronoun relates to one individual in each of these situations. In this view, the possessive pronoun has the properties of an E-type pronoun, i.e., a definite expression, whose interpretation in this type of structure depends on the generic operator, and not on the coindexed quantifier. Thus, the relation between the two nominals is not based on true binding between a universal quantifier ('every student') and possessive pronoun ('her (thesis year)'). The conditions of the universal quantifier *every* are trivially fulfilled, by assuming that there is exactly one individual in each situation under the genericity operator. In (15a) on the other hand, the sentence-initial adverb 'last year' supports the particular interpretation. Thus, this structure does not contain an operator that creates conditions for the occurrence of binding illusions. Instead, binding is excluded as the c-command requirement for true binding is not fulfilled, just as BT predicts.

Assuming quantifier raising at LF for episodic cases, WCO effects are theoretically predicted for quantified-object antecedents binding possessive pronouns inside the subject. Let us recall the data from Reinhart (2002) in (16a) and (17a), which indicate that, unlike agentive verbs, EO verbs license backward variable binding. As already mentioned in Section 2, this is attributed to the underlying syntactic or thematic characterization of experiencer objects as subject-like arguments that consequently serve as a proper binder, in contrast to canonical patient objects. (16b) and (17b) represent the corresponding LF

4 Note that there are also earlier observations regarding these sentence-level semantic effects on bound anaphora. See for example Reinhart's (1983) comments on "Semantic problems with quantified NP anaphora" (Reinhart 1983: Appendix).

structures. The EO structure in (16) is analyzed by treating theme subjects as derived subjects and having c-command requirements that can already be met at deep structure. This prevents the occurrence of any WCO effects triggered by Quantifier Raising. For the agentive structure in (17), on the other hand, the c-command relation is established at LF by movement across a coindexed variable, violating crossover restrictions.

(16) a. *His*$_{i}$ *health worries*$_{psych}$ *every patient*$_{i}$.
b. [*every patient*$_{i}$]$_{j}$ [[*his*$_{i}$ *health*]$_{k}$ [*worries* t$_{j}$ t$_{k}$]]

(17) a. **His*$_{i}$ *doctor visited*$_{agentive}$ *every patient*$_{i}$.
b. [*every patient*$_{i}$]$_{j}$ [[*his*$_{i}$ *doctor*] *visited* t$_{j}$]

However, examples of this kind are not controlled with respect to a possible implication of genericity operators. Possible interaction of the quantified nominals with implicit or explicit event quantification is relevant for the BB data. As discussed above, a generic version of (16)/(17), paraphrased in (18), would not represent true pronominal binding.

(18) a. *From time to time, his*$_{i}$ *health worried every patient*$_{i}$.
b. *From time to time, his*$_{i}$ *doctor visited every patient*$_{i}$.

As has been shown before, the WCO effect disappears under the generic reading of a structure, and the bound variable interpretation of the pronoun becomes available; see (18). Thus, it is possible that the diagnosis of BB structures, as they are reported in the literature, is based on illusory binding configurations induced by interactions with sentence-level quantification, especially if the compatibility with genericity operators varies within and between different verb classes. If we take into account assumptions on the interaction of stativity and genericity (Chierchia 1995; Glasbey 2006), it is plausible to assume that the preference for a generic interpretation is stronger with EO verbs in their stative reading than with agentive verbs (see also Arad 1998a, Arad 1998b). Hence, judgments of BB structures made without explicitly-introduced sentence aspect may be based on this kind of preference, instead of an argument structural difference between verb types.

4 Method

A general issue that emerges from the previous discussion is the considerable variation that is associated with BB. This includes issues of lexical aspect of

the verbs, properties of the involved NPs, and event quantification, as well as controversial judgments of similar data by different authors (see also the discussion in Grafmiller 2013). The research question of the present study is whether EO verbs have an effect on the acceptability of BB, an effect that is not reducible to the properties of event quantification. The experimental design is outlined in Section 4.1, the material is presented in Section 4.2, followed by the experimental procedure in Section 4.3.

4.1 Experimental design

We conducted two acceptability studies testing BB structures that consider two factors crucial for BB, namely Verb Class (experiencer/agentive) and Sentence Aspect (particular/generic). Further factors relevant for this syntactic possibility, in particular subject type and the type of anaphor, were kept constant across the relevant structures. The same factorial design is applied to accusative and dative EO structures. Our hypotheses are summarized in (19); the expected distribution of the BB effect is presented in Table 1.

(19) a. Verb Class
Experiencer structures containing subject matter subjects license BB; structures containing canonical transitive verbs with agentive subjects do not.
b. Sentence Aspect
BB with particular sentence aspect violates Binding Principles and triggers WCO effects; generic sentence aspect licenses illusory BB not determined by Binding Principles.

The consequences of these predictions for the research question are straightforward: If proper BB with experiencer verbs exists, we expect a main effect of Verb Class. If Sentence Aspect has a main effect too, this factorial design will lead to an interaction of Verb Class and Sentence Aspect with respect to the acceptability of BB. If the BB effects with psych verbs are just artifacts of event quantification, the results are only expected to involve a main effect of Sentence Aspect.

The predictions in Table 1 refer to the possibility of BB under particular conditions of Verb Class and Sentence Aspect. The type of data that we collected in this study involves gradience, which arises through the examination of a sample of speakers and a sample of lexicalizations of the syntactic structures at issue. That is, the experimental data will not directly (dis)confirm the *possibility* of BB under the conditions at issue, but they will inform us about

Table 1: Expected BB effects across the factors of interest.

		Sentence Aspect	
		particular	generic
Verb Class	experiencer	proper BB	illusory BB
	agentive	no BB	illusory BB

the *influence* of the conditions at issue. It is possible that the effect of Verb Class is not identical to the effect of Sentence Aspect, since BB arises through different mechanisms in these phenomena (syntactic dependency vs. fulfillment of the coindexation through the genericity operator). Furthermore, gradience may result from the processing complexity of the examined configurations.

In order to offer an estimation of the obtained effects' levels, the filler items included three control structures from the same grammatical domain (see examples in [23]). The first, a Principle-C violation, was expected to receive a choice of lowest grammaticality. Forward binding examples and examples involving backward coreference were expected to show the acceptability level of generally acceptable configurations.

4.2 Material

In Section 3 we discussed several aspects that need to be controlled for, in order to achieve a proper binding configuration. Since structures with inherently reflexive ('himself')/reciprocal ('each other') anaphors should not be used uncritically, we examine the reflexive use of possessives ('his', 'her' etc.). Furthermore, as argued in Section 3.3, generic readings are strongly accessible for an unbound interpretation of pronoun and quantifier. Thus, we control for Sentence Aspect by using explicit adverbial markers and the preferred tense marking of the verb, respectively; see (21).

As for the factor Verb Class in the accusative experiment, we make use of Reinhart's (2001) observation that the crucial type of EO structure licensing BB is the one with subject matter (SM) subjects. In many cases, the distinction between SM and the alternative causer subject is quite vague. Usually, the interpretation strongly depends on contextual information, which can either be provided by sentence-internal lexical material or external information. For example, this information could be the expression of an alternative causer, leading to a SM interpretation (Reinhart 2002). In order to direct the primary subject

interpretation towards a SM role, we chose verbs according to their preferences of preposition selection for the stimulus argument when built as experiencer subject (ES) structures. The SM role is expressed by an *about*-phrase in English (see Pesetsky 1995). In German, the complements of the ES alternates of EO verbs are either headed by *von* 'by' or *über* 'about'. The preposition that indicates a SM role and excludes a causer interpretation is *über*. According to preposition selection of the ES-alternates at least three different groups of corresponding EO verbs may be identified; see (20). There is a class that primarily licenses *von*-paraphrases (20a), another licenses *über*-complements (20b), while a third contains verbs that frequently co-occur with either preposition (20c).[5]

(20) a. primarily licensing preposition *von*
angewidert 'disgusted', *ermüdet* 'tire out', *begeistert* 'sparked', *provoziert* 'provoked', *fasziniert* 'fascinated', *verunsichert* 'anxious, *genervt* 'annoyed', *beeindruckt* 'impressed', *motiviert* 'motivated', *gelangweilt* 'bored' etc.
b. primarily licensing preposition *über*
erfreut 'delighted', *bestürzt* 'distraughted', *verärgert* 'upset', *amüsiert* 'amused', *verwundert* 'astonished', *erstaunt* 'stunned, *empört* 'outraged', *deprimiert* 'depressed', *beunruhigt* 'concerned', *entsetzt* 'appalled', *betrübt* 'saddened' etc.
c. both licensing prepositions *von* and *über*
enttäuscht 'disappointed', *überrascht* 'surprised', *erschrocken* 'frightened', *begeistert* 'thrilled', *verblüfft* 'bewildered', *schockiert* 'shocked' etc.

We assume that EO-verbs which do not (or only marginally) allow *über*-complements with their ES-alternates do not license SM subjects at all. Thus, for the test material, we restricted the class of EO verbs to those verbs that primarily license *über X* with their ES-alternate; see (20b). As far as possible, we also avoided verbs with an established tendency to choose *von*-paraphrases, in order to maximally reduce the likelihood for agent or causer interpretations of the subject (see verbs in Appendix A and B). For the agentive verb type, we chose canonical transitive verbs with agent subjects (see Appendix A and B). We refrained from using transitive verbs with causer subjects, as BB effects may be influenced by the causative feature (Cheung and Larson 2015).

5 The classification was verified with a corpus search in the *Digitales Wörterbuch der Deutschen Sprache*, available at http://www.dwds.de, using the core corpus and the newspaper corpora (last retrieval 11. 08. 2015). In particular, the verbs in (20b) which were used in the experiment, either do not occur at all or occur very rarely with the preposition *von*.

The selected verb types show different preferences with respect to the animacy of their subjects. Agents are predominantly animate, whereas the typical SM subject is inanimate. There are reasons to follow these preferences (although a design with only animate subjects would have technically been possible). An inanimate subject of EO structures is necessary in order to obtain the required SM interpretation, and in order to avoid agentive interpretations (which are only possible with animate subjects). Finally, parallel for both verb classes, we used complex subjects, in which the possessive variable is embedded within an animate genitive phrase.

Illustrative examples of the accusative study are given in (21) (see Appendix, Table A for a complete list of the target sentences used in accusative experiment). Note that we adjusted the generic structures in (21c–d) to the past perfect syntax of the particular structure in (21a–b) by using the modal operators *können* 'may' and *würden* 'would' as finite auxiliaries in V2, in addition to the quantificational adverbs. This was expected to support the illusory binding interpretation.

(21) a. Particular, experiential
Neulich haben die Meinungen seiner Schwester jeden
lately have the.NOM[6] opinions his.GEN sister everyone.ACC
verwundert.
astonished

b. Particular, agentive
Neulich haben die Schulkameraden seiner Schwester jeden gehänselt.
'Lately, his sister's school buddies teased everyone.'

c. Generic, experiential
Hin und wieder können die Meinungen seiner Schwester jeden verwundern.
'Every now and then, his sister's opinions may astonish everyone.'

d. Generic, agentive
Hin und wieder würden die Schulkameraden seiner Schwester jeden hänseln.
'Every now and then, his sister's school buddies would tease everyone.'

The material for the dative study was compiled according to the same principles. Twelve dative EO structures were contrasted with twelve dative agentive structures. German exhibits a restricted class of agentive verbs with inherent dative case. These verbs are all intransitives. However, the agentive structures

6 Abbreviations: ACC accusative; DAT dative; GEN genitive; NOM nominative.

are uniform in their thematic properties, i.e., $\text{AGENT}_{\text{NOM}}$ – $\text{THEME}_{\text{ACC/DAT}}$. Additionally, all verbs considered in the dative experiment uniformly select *have* as perfect auxiliary (see illustration in [22] and a full list of the target items in Appendix, Table B).

(22) a. Particular, experiential
Letztens haben die Träume seiner Kinder jedem gefallen.
'Lately, his children's dreams pleased everyone.'
b. Particular, agentive
Gestern haben die Schulfreunde seiner Kinder jedem zugehört.
'Yesterday, his children's school buddies listened to everyone.'
c. Generic, experiential
Hin und wieder können die Träume seiner Kinder jedem gefallen.
'Every now and then, his children's dreams may please everyone.'
d. Generic, agentive
Prinzipiell würden die Schulfreunde seiner Kinder jedem zuhören.
'In principle, his children's school buddies listen to everyone.

The fillers contained three control structure types that are expected to be informative for the effect level in comparison to related phenomena (see Section 4.1). Each control structure type occurred in six lexicalizations. The control structures are illustrated in (23); the NPs to be tested for coindexation are underlined. The Principle-C violation in (23a) is expected to offer a baseline for the speakers' behavior with a configuration where coindexing is categorically excluded. The other control structures allow for coindexing. (23b) is an example of backward coreference, with a proper name as antecedent. Forward binding was implemented through a passive construction, see (23c) for the accusatives and (23d) for the dative agentive verbs. Since the dative EO verbs do not license passives, forward binding with these verbs was tested by inverting the order of the arguments; see (23e).

(23) a. Principle-C violation
Jetzt wird er gleich den Kellner rufen.
'Now, he will call the waiter.'
b. Backward coreference
Heute haben die Fragen seiner Mutter Micha verärgert.
'Today, his mother's question annoyed Micha.'
c. Forward binding (accusative experiment)
Gestern wurde jeder von den Beratern seiner Bank überprüft.
'Yesterday, everybody was checked by his bank's consultants.'

d. Forward binding (agentive dative verbs)
Gestern wurde jedem von den Beratern seiner Bank gedroht.
'Yesterday, everybody was threatened by his bank's consultants.'
e. Forward binding (experiencer dative verbs)
Letztens haben jedem die Träume seiner Kinder gefallen.
'Lately, everybody was pleased by his children's dreams.'

4.3 Procedure and data evaluation

The BB reading of the target sentences competes with a second reading in which the pronoun refers to an antecedent outside the clause. The latter reading is always acceptable and probably the preferred option (Büring 2005: 42). In order to exclude this interpretation, the putative coindexed expressions were color-coded and the participants were asked to judge the acceptability of the coindexed reading. The instruction in (24) was presented with each target. During the training section, participants were presented examples with variable binding and were given paraphrases illustrating the coindexed reading of these examples.[7] Participants were instructed to make a binary choice: acceptable vs. non-acceptable. Previous studies show that scalar and binary acceptability measurements are equally informative for our purposes (Bader and Häussler 2010b; Weskott and Fanselow 2011).

(24) *Finden Sie den Satz akzeptabel unter der Bedingung, dass sich die beiden markierten Wörter auf dieselbe Person beziehen*?
'Do you find the sentence acceptable under the condition that the highlighted words relate to the same person?'

The fact that the coindexed reading of the marked material is not enforced may introduce a bias towards judging sentences as acceptable, but not with the intended reading. This potential bias is not confounded with the conditions of interest, i.e., it is expected to be constant across conditions.

The experiments were run as web-based studies. Each experimental session took approximately 15 minutes. Table 2 presents the speakers' samples. We prepared three pseudo-randomized lists randomly assigned to the participants. Each list contained 16 BB target sentences (4×4; 1 : 4 target-filler ratio). A list

7 Previous experimental studies on binding/coreference use paraphrases in order to explain the intended readings (see, e.g., Featherston and Sternefeld 2003: 32).

Table 2: Subjects and periods of testing.

Study	*N*	female	age range	age average	period
Accusative	102	73	18–49	26.5	11/14–02/15
Dative	102	72	19–38	26.2	01/15–02/15

included one target sentence per item (of the 12 items),[8] as characterized in Section 4.2 (see also Tables A and B in the Appendix). The remaining four target sentences per list were distributed over the three lists, such that some lexicalizations occurred more than once. However, we excluded multiple occurrences of a target verb in a list. The control fillers were distributed over the experimental lists in such a way that each list contained two lexicalizations per control type.

The experimental outcome is frequencies of positive ('yes') and negative ('no') decisions for all factorial conditions. In order to draw statistical inferences, we fitted generalized linear mixed-effects models. In both experiments, the fixed factors are Sentence Aspect (particular/generic) and Verb Class (experiential/agentive) as well as their interaction. Contrasts between factor-levels were modeled such that the level of interest (Verb Class: experiential; Sentence Aspect: generic) is compared with its complement (Verb Class: agentive; Sentence Aspect: particular) as a baseline. The estimates represent the effect of the level of interest, whereby the baseline is assumed to be zero and positive values indicate a shift toward positive ('yes') choices. Subjects and Items were modeled as random factors.

5 Experimental results

The obtained frequencies of positive and negative choices of a BB reading are presented in Table 3. There are no missing values, i.e., 408 observations for each condition were collected in both data sets.

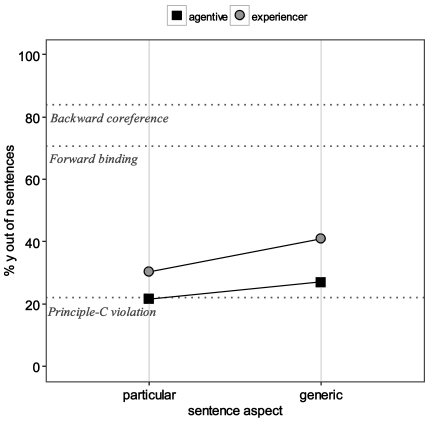
Figure 1 provides a visualization of the proportions of *yes*-choices for both data sets. Furthermore, it indicates the mean values obtained for the control structures. The filler baselines are the percentages of *yes*-choices out of 204 judgments per experiment (see Sections 4.1 and 4.2): (a) Principle-C violation: accusative 22.1 % (SE 2.9); dative 17.6 % (SE 2.7) *yes*-choices; (b) Forward bind-

8 The decision to construct 12 (instead of 16) items is due to the fact that, being subject to the methodological requirements outlined in Section 4, the dative verb inventories are limited.

Table 3: Frequencies of yes/no choices of BB with possessives inside subject.

		experiencer structures				agentive structures				total	
		particular		generic		particular		generic			
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
Accusative	yes	122	30	164	40	88	22	109	27	483	30
	no	286	70	244	60	320	78	299	73	1149	70
	total	408	100	408	100	408	100	408	100	1632	100
Dative	yes	165	40	173	42	106	26	104	25	548	34
	no	243	60	235	58	302	74	304	75	1084	66
	total	408	100	408	100	408	100	408	100	1632	100

a) Accusative



b) Dative

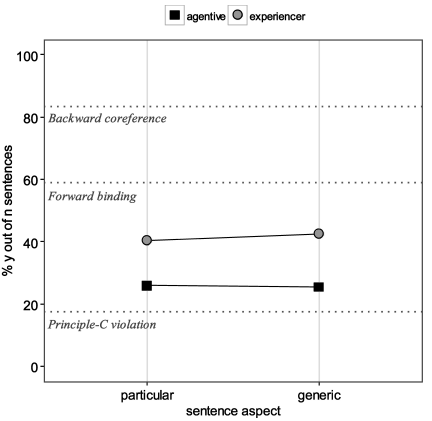


Figure 1: Proportions of *yes*-choices of BB with possessives inside subject.

ing: accusative 70.6 % (SE 3.2); dative 58.8 % (SE 3.5) *yes*-choices; (c) Backward coreference: accusative 83.8 % (SE 2.6); dative 83.3 % (SE 2.6) *yes*-choices.

At first, we point to the differences between the two experiments, i.e., the role of case. In general, BB is more frequently accepted with a dative argument (average 34 %) than with an accusative argument (average 30 %; see Table 3, total). Furthermore, in both experiments (dative and accusative), BB is more frequently accepted with experiencer structures (average 38 %) than with agentive structures (average 25 %). The effect of Sentence Aspect (particular vs. generic) depends on case; it only appears in the accusative results.

In the accusative experiment, particular agentive structures display the lowest acceptability proportion (22 %); genericity raises it to 27 %. Genericity

has a greater impact on experiencer structures where it raises the proportions from 30 % to 40 % *yes*-choices. Thus, experiencer structures, as well as generic structures, increase the positive judgments of BB for accusative items, with Verb Class having a greater influence than Sentence Aspect.

The dative data reveal that the choice of BB is only slightly higher with the generic experiencer items than with the particular ones (40 % vs. 42 %). With particular and generic agentive structures, *yes*-choices of BB show a small difference in the inverse direction (26 % particular vs. 25 % generic). Consequently, the dative results suggest that only Verb Class has a clear positive effect on the acceptability of BB, whereas the effect of Sentence Aspect is hardly visible at all.

The experimental data were fitted with generalized linear mixed-effects models, based on a backwards selection procedure starting from the maximal model (see Barr et al. 2013). In both experiments (accusative and dative), the random-effects model with the maximal fit contains a by-subjects random intercept and a by-subjects random slope with Verb Class, while the by-items random intercept could be removed without a significant loss of information (in terms of a chi-square test of the difference between deviances). This result reflects the fact that the by-subjects variance is greater than the by-items variance in both experiments (accusative experiment: $s^2_{\text{subjects}} = 7.1$; $s^2_{\text{items}} = .01$; dative experiment: $s^2_{\text{subjects}} = 3.1$; $s^2_{\text{items}} < .001$). Examining the by-subjects random slopes, we found that the converging model with the best fit contains a random slope with Verb Class in both experiments (the comparison between the single intercept models and the models including a random slope is significant: accusative, $\chi^2(2) = 57.2$; $p < .001$; dative, $\chi^2(2) = 18.3$; $p < .001$). Hence, in both experiments, we consider models with the same random-effect structure, i.e., a by-subjects random intercept and a by-subjects random slope with Verb Class.

The descriptive data in Figure 1 shows that the effect of Verb Class is larger than the effect of Sentence Aspect in both experiments. The odds (p(yes)/(1–p(yes))) of accepting BB with experiencer verbs is 1.7 times greater than the corresponding odds with agentive verbs in the accusative experiment, and 2.1 times greater in the dative experiment; the odds of accepting BB in the generic aspect is 1.4 times greater than the corresponding odds in the particular aspect in the accusative, and only 1.03 times greater in dative. The descriptive data suggest a slight interaction effect in the accusative experiment. The statistical analysis reveals that removing the interaction between Verb Class and Sentence Aspect leads to a better fit (in terms of the AIC values) without significant loss of information (in terms of the χ^2 value of the difference between deviances). The maximal fit is reached by a model including two main effects in the accusative experiment (AIC = 1293, $df = 6$; difference to the deviances of models with a single main effect: $\chi^2(1) = 20.8$, $p < .001$ for Verb Class;

Table 4: Mixed effect regression results of the accusative and the dative experiments; Random effects: accusative: $s^2_{\text{Subjects}} = 14.1$; $s^2_{\text{Subjects\^{}VerbClass}} = 4.9$; dative: $s^2_{\text{Subjects}} = 4.2$; $s^2_{\text{Subjects\^{}Verbclass}} = 1.3$.

	fixed effects	estimate	SE	*z*	*p* (>|*z*|)
accusative	intercept	−3.58	.55	−6.56	< .001
	Verb Class (experiencer)	1.83	.45	4.05	< .001
	Sentence Aspect (generic)	.84	.17	5.06	< .001
dative	intercept	−1.81	.26	−6.87	< .001
	Verb Class (experiencer)	1.22	.22	5.48	< .001

Table 5: Mixed effect regression results of the data with particular structures (random factors: Subjects, Subjects^Verb Class).

fixed factor	estimate	SE	*z*	*p* (>|*z*|)
intercept	−2.76	.36	−7.54	< .001
Case (dative)	.94	.39	2.41	< .05
Verb Class (experiencer)	1.06	.26	4.03	< .001

$\chi^2(1) = 25.4$, $p < .001$ for Sentence Aspect) and a model only including a main effect of Verb Class in the dative experiment (AIC = 1642, $df = 6$; difference to the deviance of a model without fixed effects: $\chi^2(1) = 29.4$, $p < .001$). The parameters of the fixed-effects of the models with the best fit are given in Table 4.

The data reveal a robust effect of Verb Class in both cases. The effect of Sentence Aspect depends on case; precisely, it was only obtained with accusative case. Furthermore, the data indicates a difference between accusative and dative case. The present studies were not designed to test hypotheses for the difference between accusative and dative: the two cases were examined in different experiments, i.e., with different speakers and different items. However, we observe a difference in the obtained data and it is worth testing whether this difference is a significant finding or may be due to chance. For this purpose, we fitted a generalized linear mixed-effects model on the data in the particular aspect condition, since this is the exact subset of data in which hypotheses with respect to verb type or case directly apply (the generic aspect may involve the additional effects of illusory binding). The examined dataset involves two fixed effects: Verb Class (experiencer, agentive) and Case (dative, accusative). The data comes from two different experiments, i.e., the variation Within Subjects and Within Items can be observed for Verb Class but not for Case. Consequently, the maximal random-effects model that was considered contained the random slopes of subjects/items with Verb Class (and not so with Case). After

model reduction, the maximal fit (AIC = 1562, *df* = 4) is reached by a model including a random intercept for SUBJECTS, the random slope SUBJECTS and VERB CLASS and two fixed main effects (no interaction effect): the difference between deviances of a model with two main effects and a model with a single main effect is significant for CASE ($\chi^2(1) = 5.94$, $p < .05$) and for VERB CLASS ($\chi^2(1) = 15.8$, $p < .001$). The parameters of the model that reaches the best fit are listed in Table 5. This result confirms that BB is more acceptable with dative case than with accusative case across verb classes.

6 Discussion

The effects of VERB CLASS and SENTENCE ASPECT are in line with the expectations in (19) and Table 1. Experiential VERB CLASS significantly increases the acceptability of BB structures both with accusative and dative case, while SENTENCE ASPECT has significant impact only with accusative case. The experimental results did not show an interaction between the two factors VERB CLASS and SENTENCE ASPECT. Rather, they showed cumulative main effects of the factors with accusative verbs and no significant effect of SENTENCE ASPECT with dative verbs. The relevance of this result for the research question of this article is straightforward (compare predictions in Section 4.1): the acceptability of BB is a genuine effect of (accusative/dative) experiencer-object verbs not reducible to effects of SENTENCE ASPECT. This conclusion is opposed to approaches declining that BB effects are related to psych verbs (e.g., Bouchard 1995; Arad 1998b) or restrict subject-like properties to dative arguments (e.g., Wegener 1998; Fanselow 2000; Fanselow 2003). Two main aspects of the findings must be discussed in more detail: (a) the difference between dative and accusative results, and (b) the generally low level of acceptability in the obtained data. A comparison between experiments shows that the likelihood of BB increases with the dative (see Table 5). The question here is where the effect of case comes from. Comparing the data points in Table 3 reveals that the largest difference between the two cases lies in the proportions of particular experiencer structures (30 % *yes*-choices for accusative and 40 % *yes*-choices for dative verbs). The further proportions are similar in both experiments. Accusative and dative experiencer verbs display differences in their aspectual potential (Section 2). While accusative experiencer verbs may have stative and eventive readings, dative experiencer verbs typically have only a stative interpretation. We speculate that exactly this property of the dative experiencer verbs is crucial for the result: the stativity of these verbs supports the acceptability of BB to the effect that the generic SENTENCE ASPECT does not have any additive effect.

In contrast, the accusative experiencer structures are potentially interpreted as eventive and thus, provide the potential for an additive effect of the generic Sentence Aspect, which would result in illusory binding, (see Section 3.3). This is exactly what the empirical findings show: the effect of Sentence Aspect was confirmed in the accusative experiment (see Table 4), while the dative experiment did not provide evidence for an effect of Sentence Aspect.

Another issue is the overall acceptability of BB in our data: the percentage of *yes*-choices (in all conditions) is 30 % for the accusative experiment and 34 % percent for the dative experiment. In other words, the speakers rejected BB in the majority of their reactions. In a strict empirical view, the only interpretable facts are the differences in the conditional probability of a *yes*-choice under the treatments at issue. The results of an experimental study cannot directly show whether BB is grammatical or not; they show that Verb Class has a genuine influence on the acceptability of BB that is not due to chance. Hence, this finding demands a linguistic interpretation – independently of the level of the judgments. As the thematic variation of the subject was controlled, and this effect is not reducible to variations of Sentence Aspect, it confirms the idea that EO psych verbs have exceptional binding properties.

The results of the control fillers may contribute to the interpretation of the levels of the obtained percentages. The fillers establish a clear contrast between configurations that exclude coindexing, such as the Principle-C violation (accusative 22.1 %; dative 17.6 %), and configurations that allow for coindexing, i.e., forward binding (accusative 70.6 %; dative 58.8 %) and backward coreference (accusative 83.8 %; dative 83.3 %). The acceptability levels of these phenomena are similar in both experiments. The main difference lies in the acceptability level of the forward binding, which is probably due to the difference of the examined structures: While the accusative structures featured a nominative QP as a binder (23c), the dative forward binding structures featured a (preposed) dative QP while the anaphor was part of either the passive agent PP (23d) or the nominative NP (23e). Backward coreference and forward binding are considered as fully grammatical in the literature. The observed difference between these structures can be attributed to the fact that the processing of variable binding is semantically more demanding than the processing of coreference.

Turning to the comparison with the target results, it can be observed that the judgments for agentive verbs, which are not expected to allow for BB, are at a similar level with the judgments of the Principle-C violations. The effects of Verb Class (experiencer) and Sentence Aspect (generic) are added to this level of acceptability. However, even the highest acceptability level, which is reached with the dative EO verbs in the generic reading (42 %), is considerably

below the acceptability of the forward binding controls in the same sample (58.8 %). This is an interesting contrast, but it would be empirically unjustifiable to conclude that this result reflects a difference in grammaticality. Note that also the contrast between backward coreference and forward binding does not reflect a difference in the grammaticality of these structures. The comparatively low level of acceptability with BB can plausibly be attributed to the accumulation of processing difficulties stemming from a backward dependency in addition to variable binding. Furthermore, it is clear that the preferred reading of the examined structures is not the coindexed reading, but a reading with a contextual antecedent. Although the participants were instructed to judge the possibility of the coindexed reading, we cannot assess to what extent they are influenced by their preferences during the spontaneous interpretations of the target sentences. Therefore, the fact that the significant contrast between the verb classes is located between clearly ungrammatical structures and presumed well-formed structures could be due to degradation triggered independently from our hypotheses.

In sum, the reported facts show that the acceptability of the coindexed structures involves gradience influenced by a large set of factors (see Featherston and Sternefeld [2003] for an empirical study on the sources of gradience with reflexive structures). The present experiment was designed to test whether Verb Class has an effect on BB in German and whether this effect is independent from the effect of Sentence Aspect, which may influence the interpretation of variable binding. The confirmation of the main effect of Verb Class under the controlled conditions of this study indicates that there is a significant difference in the examined verb groups. This difference cannot be traced back to further intervening factors.

7 Conclusion

The aim of this study was to provide evidence for the licensing of Backward Binding (BB) in German with special reference to EO verbs. The theoretical discussion at the beginning revealed that the established BB data should be treated with caution, mainly for two reasons. First, the depicted unclear status of BB as a psych effect emerges due to a small amount of examples potentially influenced by ambiguities that arise with accusative EO verbs. By making use of Reinhart's subject matter/causer distinction for accusative EO verbs, we controlled for this source of variation and provided a representative set of structures as a proper basis for testing BB. Second, intuitions about BB are at risk of being affected by factors that lead to illusory binding, rather than proper

binding. Judgments of variable binding may be influenced by habitual interpretations, as they demonstrably avoid WCO violations. Thus, in the experimental studies, we defined the basis for a proper binding configuration and implemented two acceptability studies with the same design, for accusative and for dative EO structures, respectively.

The core finding of the experimental studies is that both dative and accusative EO structures license proper BB to a significantly higher degree than agentive structures with dative and accusative objects, respectively. Furthermore, the experimental results suggest a stronger licensing power of BB for dative experiencers, in contrast to accusative experiencers, due to the unequivocally stative nature of the dative EO verbs. These findings substantiate the exceptional nature of EO verbs as compared to agentive verbs, which is stated in the literature. Furthermore, the validity of the designed test structures, notably the influence of the factor Sentence Aspect is supported by an independent effect of genericity within the accusative results. This shows that generic operators may trigger an illusory binding effect. However, since Verb Class has a main effect in both experiments, we conclude that BB is a genuine psych effect in German.

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Appendix

Table A: Experimental material, accusative experiment.

item	agentive verbs	experiencer verbs
particular aspect		
01	Gestern haben die Eltern seiner Freunde jeden begrüßt.	Gestern haben die Aussagen seiner Freunde jeden deprimiert.
02	Gestern haben die Ärzte seiner Lebensgefährtin jeden beraten.	Letztens haben die Wünsche seiner Lebensgefährtin jeden verärgert.
03	Gestern haben die Freundinnen seiner Frau jeden kritisiert.	Heute haben die Vorstellungen seiner Frau jeden entsetzt.
04	Gestern haben die Geschwister seiner Freunde jeden überprüft.	Gestern haben die Ängste seiner Freunde jeden betrübt.
05	Neulich haben die Schulkameraden seiner Schwester jeden gehänselt.	Neulich haben die Meinungen seiner Schwester jeden verwundert.
06	Damals haben die Kinder seiner Nachbarn jeden besucht.	Neulich haben die Probleme seiner Nachbarn jeden erstaunt.
07	Gestern haben die Freunde seiner Kinder jeden geschlagen.	Gestern haben die Träume seiner Kinder jeden erfreut.
08	Gestern haben die Assistenten seiner Ärztin jeden untersucht.	Gestern haben die Vermutungen seiner Ärztin jeden schockiert.
09	Heute haben die Kollegen seiner Frau jeden unterstützt.	Neulich haben die Ideen seiner Frau jeden amüsiert.
10	Gestern haben die Verwandten seiner Freundin jeden umarmt.	Heute haben die Ansichten seiner Freundin jeden bestürzt.
11	Gestern haben die Anwälte seiner Exfrau jeden angerufen.	Damals haben die Beobachtungen seiner Exfrau jeden empört.
12	Heute haben die Sekretärinnen seines Chefs jeden ausgefragt.	Heute haben die Fragen seines Chefs jeden beunruhigt.
generic aspect		
01	Im Allgemeinen würden die Eltern seiner Freunde jeden begrüßen.	Im Allgemeinen können die Aussagen seiner Freunde jeden deprimieren.
02	Normalerweise würden die Ärzte seiner Lebensgefährtin jeden beraten.	*Hin und wieder können die Wünsche seiner Lebensgefährtin jeden verärgern.*
03	*Hin und wieder würden die Freundinnen seiner Frau jeden kritisieren.*	*Üblicherweise können die Vorstellungen seiner Frau jeden entsetzen.*
04	Prinzipiell würden die Geschwister seiner Freunde jeden überprüfen.	Prinzipiell können die Ängste seiner Freunde jeden betrüben.
05	Hin und wieder würden die Schulkameraden seiner Schwester jeden hänseln.	Hin und wieder können die Meinungen seiner Schwester jeden verwundern.

06	Normalerweise würden die Kinder seiner Nachbarn jeden besuchen.	Tendenziell können die Probleme seiner Nachbarn jeden erstaunen.
07	Heutzutage würden die Freunde seiner Kinder jeden schlagen.	Hin und wieder können die Träume seiner Kinder jeden erfreuen.
08	Im Ernstfall würden die Assistenten seiner Ärztin jeden untersuchen.	Im Normalfall können die Vermutungen seiner Ärztin jeden schockieren.
09	Im Allgemeinen würden die Kollegen seiner Frau jeden unterstützen.	Im Allgemeinen können die Ideen seiner Frau jeden amüsieren.
10	Heutzutage würden die Verwandten seiner Freundin jeden umarmen.	Hin und wieder können die Ansichten seiner Freundin jeden bestürzen.
11	Hin und wieder würden die Anwälte seiner Exfrau jeden anrufen.	Hin und wieder können die Beobachtungen seiner Exfrau jeden empören.
12	Tendenziell würden die Sekretärinnen seines Chefs jeden ausfragen.	Tendenziell können die Fragen seines Chefs jeden beunruhigen.

Table B: Experimental material, dative experiment

item	agentive verbs	experiencer verbs
particular aspect		
01	Heute haben die Sekretärinnen seiner Partner jedem widersprochen.	Gestern haben die Aussagen seiner Partner jedem geschmeichelt.
02	Gestern haben die Anwälte seiner Gläubiger jedem geantwortet.	Heute haben die Versprechen seiner Gläubiger jedem genügt.
03	Neulich haben die Eltern seiner Freunde jedem applaudiert.	Heute haben die Ängste seiner Freunde jedem leidgetan.
04	Gestern haben die Schulfreunde seiner Kinder jedem zugehört.	Letztens haben die Träume seiner Kinder jedem gefallen.
05	Neulich haben die Anwälte seiner Mitarbeiter jedem gedroht.	Heute haben die Ideen seiner Mitarbeiter jedem eingeleuchtet.
06	Gestern haben die Freunde seiner Kinder jedem gehorcht.	Neulich haben die Leistungen seiner Kollegen jedem imponiert.
07	Heute haben die Pfleger seiner Großeltern jedem geholfen.	Letztens haben die Weisheiten seiner Großeltern jedem gefehlt.
08	Neulich haben die Kinder seiner Nachbarn jedem zugeschaut.	Gestern haben die Vorschläge seiner Nachbarn jedem gepasst.
09	Heute haben die Berater seines Chefs jedem gekündigt.	Gestern haben die Ansichten seiner Freunde jedem zugesagt.
10	Letztens haben die Ehefrauen seiner Chefs jedem gratuliert.	Heute haben die Aufmunterungen seiner Chefs jedem ausgereicht.
11	Letztens haben die Lehrer seiner Kinder jedem abgesagt.	Letztens haben die Sorgen seiner Kinder jedem wehgetan.
12	Letztens haben die Ärzte seiner Eltern jedem zugestimmt.	Neulich haben die Fragen seiner Eltern jedem gestunken.

Table B (continued)

item	agentive verbs	experiencer verbs
generic aspect		
01	Hin und wieder würden die Sekretärinnen seiner Partner jedem widersprechen.	Generell können die Aussagen seiner Partner jedem schmeicheln.
02	Generell würden die Anwälte seiner Gläubiger jedem antworten.	Im Allgemeinen können die Versprechen seiner Gläubiger jedem genügen.
03	Normalerweise würden die Eltern seiner Freunde jedem applaudieren.	Grundsätzlich können die Ängste seiner Freunde jedem leidtun.
04	Prinzipiell würden die Schulfreunde seiner Kinder jedem zuhören.	Hin und wieder können die Träume seiner Kinder jedem gefallen.
05	Hin und wieder würden die Anwälte seiner Mitarbeiter jedem drohen.	Tendenziell können die Ideen seiner Mitarbeiter jedem einleuchten.
06	Normalerweise würden die Freunde seiner Kinder jedem gehorchen.	Hin und wieder können die Leistungen seiner Kollegen jedem imponieren.
07	Grundsätzlich würden die Pfleger seiner Großeltern jedem helfen.	Generell können die Weisheiten seiner Großeltern jedem fehlen.
08	Grundsätzlich würden die Kinder seiner Nachbarn jedem zuschauen.	Grundsätzlich können die Vorschläge seiner Nachbarn jedem passen.
09	Hin und wieder würden die Berater seines Chefs jedem kündigen.	Prinzipiell können die Ansichten seiner Freunde jedem zusagen.
10	Prinzipiell würden die Ehefrauen seiner Chefs jedem gratulieren.	Normalerweise können die Aufmunterungen seiner Chefs jedem ausreichen.
11	Normalerweise würden die Lehrer seiner Kinder jedem absagen.	Grundsätzlich können die Sorgen seiner Kinder jedem wehtun.
12	Im Allgemeinen würden die Ärzte seiner Eltern jedem zustimmen.	Im Allgemeinen können die Fragen seiner Eltern jedem stinken.