3.1   About project B6

3.1.1   Title: Underspecification in voice systems and the syntax-morphology interface

3.1.2   Research areas: 104-01 (Allgemeine und Angewandte Sprachwissenschaft), syntax-morphology-semantics interface

3.1.3   Principal investigator(s)

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3.1.4   Legal issues

This project includes

1.	research on human subjects or human material.	yes*
	If applicable: A copy of the required approval of the responsible ethics committee is included with the proposal.	yes
2.	clinical studies.	no
3.	experiments involving vertebrates.	no
4.	experiments involving recombinant DNA.	no
5.	research involving human embryonic stem cells.	no
6.	research concerning the Convention on Biological Diversity.	no

3.2   Summary

B6 aims to develop a model of verbal meaning composition that can capture the intricate relationship between Argument Structure alternations and Voice morphology. In phase 2, we have investigated cases of ambiguity related to Voice syncretism across languages. We have shown that the following two strategies can underlie Voice syncretisms: (i) the grammar produces one semantically underspecified morphosyntax whose interpretation is resolved at the conceptual component; or (ii) it produces different morphosyntaxes and the element that realizes them is underspecified, i.e. it is sensitive to one (or a limited number of) feature(s) that are shared by their morphosyntaxes. In phase 3, we will apply our model to the domain of psych verbs, a verb class that behaves non-uniformly with respect to event structure, argument structure, transitivity/unaccusativity and Voice morphology within as well as across languages. Our starting point will be the behavior of accusative object experiencer predicates (ObE$_{acc}$ e.g. *annoy*) in Germanic, Romance and Greek. ObE$_{acc}$ verbs, being ambiguous between agentive vs. non-agentive, and stative vs. eventive readings, represent a complex case of interaction between the different building blocks of verbal meaning. Moreover, in many languages and in earlier stages of English, ObE$_{acc}$ verbs have subject experiencer (SubjE) variants, which bear the same morphology that shows up in the Voice alternations we have studied so far. We also find that over time ObE turn into SubjE-only predicates or that physical and change of state verbs gain ObE$_{acc}$ interpretations, suggesting that psych properties cannot be stored with specific lexical items once and for all. All these facts raise non-trivial questions for the syntax-morphology-semantics interface and the relationship between ObE$_{acc}$ verbs and the two other classes of psych verbs (SubjE verbs, e.g. *fear*, and ObE$_{dat}$, e.g. *appeal to*). Our guiding hypothesis is that the observed variation in the domain of psych verbs is predictable. We aim to identify the morpho-syntactic building blocks of psych verbs and to specify the division of labor between templatic (=morpho-syntactic) structure and conceptual information in the domain of psych verbs and provide a model of how this division of labor (a) gives rise to the observed intra- and cross-linguistic variation in the expression of psychological predication, and (b) resolves the ubiquitous ambiguities that arise in this domain.

3.3   Project progress to date

3.3.1   Report and state of understanding

Background and general aims: Project B6, which started in 2010, aims to develop a model of verbal meaning composition by investigating, on the one hand, the manner in which Argument Structure (AS) alternations (and syntactic configurations more generally) relate to Voice morphology, and on the other hand, the atoms (morpho-syntactic blocks) that are included in building verbal interpretation, how these relate to external and internal arguments, and how they interact with conceptual knowledge.

Project report: ***A. Typology of Voice***. As is well-known, different operations on a verb's argument structure often surface with the same morphological marking, i.e. Voice systems show massive syncretisms. In phase 2, B6 has developed a model of the interaction between the morphological realization of Voice and AS alternations. We have examined canonical transitivity alternations in English, German, Greek and Romance (active-passive, causative-anticausative, dispositional middle, reflexive), and non-canonical alternations, e.g. the English *get*-passive, the Germanic *bekommen*-passive, adjectival passives across languages, the German *sich-lassen* middle, and Greek deponents. We have demonstrated that Voice syncretisms can result from two different grammatical strategies, specified as (i) and (ii) in the summary, and have developed tools to tease them apart. AS alternations and thus Voice syncretisms are dependent on functional syntactic Voice heads. Our system includes Active Voice, and three distinct non-active Voice heads, Passive (PV), Middle (MV), and Expletive Voice (EV).

i) Passive vs. Middle. Based on both intra- and crosslinguistic investigations and building on previous literature, we identified MV, a Voice head similar to but distinct from PV, for which we offered a concrete syntactic and semantic characterization. Languages differ with respect to whether they employ PV, MV, or both to derive canonical AS alternations. Germanic languages, e.g., only employ PV, Greek employs only Middle (Alexiadou & Schäfer 2013; Alexiadou to appear; Spathas et al. submitted), whereas Hebrew employs both (Alexiadou & Doron 2012). Both MV and PV introduce an existentially bound implicit argument. Two properties set them apart: a) whereas passives are dependent on the existence of corresponding Active Voice structures, MV shows no such restrictions; b) PV and MV structures differ in that only Passive ones give rise to a Disjoint Reference Effect between the implicit argument and overt DPs. This difference leads to **semantic underspecification** in the case of MV; MV can be used to describe a wider range of situations than PV: only MV is, in principle, compatible with reflexive situations. As hearers typically arrive at unambiguous meanings for MV structures, we have uncovered how lexical, grammatical and contextual information interact to reach these. The key property that affects the interpretation of MV is whether verbal roots belong to the class of Naturally Reflexive Verbs (NRVs) or not (Kemmer 1993). Thus in Active/Middle languages, since passive and reflexive interpretations are both built with MV, their syncretism results from syntactic uniformity. In fact, all reflexivization strategies in Greek that employ non-active (NAct) morphology build on MV. Verbs that are not NRVs (e.g. 'katastrefo' *destroy*) are only interpreted reflexively with NAct morphology if the prefix *afto-* 'auto-', an anti-assistive intensifier, is present. We have shown how its combination with MV results in a reflexive interpretation in the absence of a designated reflexivization operation.

ii) Expletive Voice. As is well-known, (certain) anticausatives and dispositional middles are marked with NAct morphology (in e.g., Greek), or with a SE-reflexive (in German(ic) and Romance). Building on Schäfer (2008), Alexiadou et al. (to appeara) show that, although such structures involve a syntactic Voice layer, they do not instantiate MV structures in Greek, which also explains why these have purely inchoative semantics (instead of reflexive semantics, contra Chierchia 2004 and others). The Voice layer in these structures acts as what we call EV, as it does not introduce an external argument variable. Therefore, dispositional middles and anticausatives do not license any kind of external argument. We show that the reflexive in these structures acts as an expletive filler of the Spec,EVP. In this way, we derive a transitive syntax (two DPs) with inchoative semantics. Crucially then, SE-reflexives are **syntactically underspecified** in that they do not have to act as anaphors, and, therefore, can appear in positions lacking a c-commanding antecedent in Spec,EVP. In languages lacking SE-anaphors, such as Greek, EV does not project a specifier and is realized with NAct morphology. The syncretism between EV and MV in Greek is then the result of **morphological underspecification**. NAct-morphology spells out Voice heads that lack a specifier, but it is underspecified for thematic differences between such Voice heads, in particular whether they introduce an existentially bound agent or not (Embick 2004). Finally, the difference between dispositional middles and anticausatives concerning agentivity evolves at the conceptual level on the basis of root semantics and other contextual triggers (Condoravdi 1989, Schäfer 2008).

iii) Reflexives in Germanic. In a series of publications and presentations, we have been concerned

with strategies of reflexivization and the representation of NRVs in Germanic (Alexiadou & Schäfer 2013; Schäfer 2012c; Schäfer 2013, to appear; Alexiadou et al. 2013). Unlike in Greek, in English, NRVs are unergative, appear with Act morphology, and, crucially, involve object drop. Thus the internal argument variable remains unsaturated and the vP denotes a predicate. The reflexive interpretation is the result of combining the vP with Active Voice via the rule of Predicate Conjunction. In German (but also in Romance), NRVs are transitive predicates involving object anaphors. In all cases, however, conceptual/encyclopedic concepts stored with lexical items and contextual information interact in a similar fashion with the different syntactic structures available in individual languages to provide reflexive interpretations. The non-uniform behavior of NRVs crosslinguistically is then explained through differences in Voice systems and inventory of anaphors. In the work reported here, we have expanded the focus-related diagnostics developed in Spathas (2010). These not only informed our analyses of different Voice construals and reflexivization strategies, but also inform Focus Theory itself, Spathas (2012, 2013).

B. Non-canonical AS alternations. a) _Passives of Reflexives_. Schäfer (2012c) provides a further context where a reflexive construal is triggered by conceptual knowledge, namely passives of reflexive verbs (PoRs), available in German and Icelandic, e.g. _Anschließend wurde sich gewaschen_. Schäfer's work shows that we must distinguish whether a SE-reflexive is only syntactically licensed (e.g. by default agreement) or also semantically bound. This leads to an updated view on Binding Principle A, which must now be divided into a syntactic part (valuation of phi-features on a SE-anaphor) and a semantic part (the SE-anaphor is valued by a c-commanding DP which translates into a semantic binder). The computational system only forces SE-anaphors to be licensed syntactically. When no semantic binder is present, as in PoRs, their (reflexive) interpretation must depend on conceptual information. Different experimental investigations show that PoRs are restricted to inherently reflexive verbs and NRVs (see also Schäfer, Zarriess, & Schulte im Walde 2013), similarly to the case of Middle Voice in Greek. b) _Let middles_. Pitteroff & Alexiadou (2012) and Pitteroff (submitted) discuss a particular type of dispositional middle in German, _let_-middles. The syntactic-semantic properties of these middles further support the view that middle is a notional, rather than a grammatical category. Thus, middles are parasitic on the Voice heads a language makes available, in particular EV, which in German projects an expletive specifier filled with _sich_ (cf. Lekakou 2005, Schäfer 2008). c) _Other types of passives_. With respect to _get_-passives, Alexiadou (2012), building on Alexiadou & Doron (2012), shows that the _get_-passive can receive a variety of readings along the lines suggested above for Greek MV. Thus MV is employed in English, too, but to derive a non-canonical passive. In Gehrke, Alexiadou, & Schäfer (submitted), we provide morphological and semantic evidence that adjectival passives in German can involve more verbal functional structure than previously assumed: next to a verbal eventive layer, some also involve Voice; see Alexiadou, Anagnostopoulou, & Schäfer (to appeara) for extensive discussion on cross-linguistic differences in this domain. With respect to _bekommen_-passives, Alexiadou, Anagnostopoulou, & Sevdali (to appearb) propose that these involve a dative-nominative alternation. While dative arguments are analyzed as PPs, in the case of _bekommen_-passives, P incorporates into the Voice-v complex lifting the phase-hood of the PP and thus the DP argument can move to T. Auxiliaries like '_bekommen_' lexicalize this Voice-v-P complex. d) _Deponent verbs_. Zombolou & Alexiadou (2013) investigate Greek deponents. Such verbs surface with NAct, some in the absence of a transitive variant, others in spite of being transitive themselves. The corpus of deponents we have compiled revealed that most of them are actually psych predicates, _afto_-reflexives, anticausatives and passives, i.e. they show alternations of the type in (A). According to Alexiadou (2013), in transitive deponents, the presence of NAct correlates with the experiencer/benefactor status of their subject; as this is generated in an applicative phrase below EV, Voice receives the same spell-out as MV.

C. Voice and event decomposition. Alexiadou & Schäfer (2011), Schäfer (2012a), Alexiadou (2014), Martin & Schäfer (2012, 2013), Martin & Schäfer (to appear), Pitteroff & Campanini (to appear), Alexiadou, Anagnostopoulou, & Schäfer (to appeara) further developed the event decomposition and the syntax-semantic mapping of causative and anticausative verbs put forth in Alexiadou et al. (2006) and Schäfer (2008). Both causative and anticausative predicates include the same event decompostion, namely an unbounded event head which merges with a result phrase. The C-I interface interprets this combination as involving a causative relation between the event and the result in both cases (cf. Ramchand 2008, Wunderlich 2012 and others). We have also provided a theory of external arguments, by investigating in depth the contrast between agents and causers, partly in collaboration with B1 and B5.

Output: Most of the results reported here were presented at a number of peer-reviewed international conferences (e.g. NELS, WCCFL, GLOW, CGSW, _Going Romance_, SALT, _Sinn und Bedeutung_) and specialized thematic workshops. Alexiadou & Schäfer organized the DGfS Workshop on _Non-canonical passives_ (Göttingen, February 2011). A selection of the contributions was published in 2013 with John

Benjamins (Alexiadou & Schäfer 2013). In collaboration with Ljudmila Geist from Project C2 and Peter de Swart from the Radbout University of Nijmegen, Spathas organized the DGfS workshop on *Perspectives on Argument Alternations* (Potsdam, March 2013). In March 2013, B6 hosted an MIT-Tromsø-Stuttgart roundtable on verbal morphosyntax. Alexiadou & Schäfer are involved in two book projects with Oxford University Press: *External arguments in transitivity alternations* co-authored with Prof. Anagnostopoulou (University of Crete), presents the results of our work on event decomposition, Voice, and transitivity alternations. *The syntax of roots and the roots of syntax*, co-edited with Prof. Borer (Queen Mary, London), discusses the role of roots as the minimal elements of word meaning. The relationship between roots and functional structure is further explored in Alexiadou's joint work with Prof. Anagnostopoulou, and Prof. Lohndal (Norwegian University of Science and Technology), presented at international conferences. Alexiadou was invited to teach a graduate course on argument alternations at the LOT 2012 summer school in Utrecht, and at the Abralin summer school in Brazil (Natal, January 2013). Schäfer was a keynote speaker at the *little v* conference (Leiden, October 2013). In 2013, Alexiadou was invited twice to Japan to present the results of B6's research. These visits form the basis for a collaboration between B6 and Prof. Matsumoto's project on *Middle and beyond: towards an integrative theory of Voice* (Osaka).

Dissertations:
1. Pitteroff, M. Non-canonical (*sich lassen*) middles. (expected completion: spring 2014)
2. Sundaresan, M., 2013. *Context and coreference in the syntax and its interfaces*. PhD thesis, University of Stuttgart

Staff: The project applied for 1,5 positions, originally held by Dr. Florian Schäfer (100%) and Cinzia Campanini (50%). In late 2011, Ms. Campanini decided to move to a job outside of academia, and her position was advertised on Linguist List. As the applications we got from prospective Ph.D. students were not convincing, we employed Dr. Spathas (in March 2012), who is currently funded 50% by the SFB and 50% by IFLA. Hiring Dr. Spathas enabled B6 to develop an integrated theory of Voice that takes morphological, syntactic as well as semantic aspects and intonation-related arguments into consideration.

3.3.2   Own project-related publications

(a) **Peer-reviewed publications**
   1. Alexiadou, A., to appear. Roots in transitivity alternations: afto/auto reflexives. In Alexiadou, A., H. Borer, & F. Schäfer, (eds.), *The syntax of roots and the roots of syntax*. Oxford: Oxford University Press
   2. Alexiadou, A., 2014. The problem with internally caused change-of-state verbs. To appear in Linguistics 52
   3. Alexiadou, A., 2012. Non-canonical passives revisited: parameters of non-active Voice. *Linguistics*, 50:1079–1110
   4. Alexiadou, A. & E. Doron, 2012. The syntactic construction of two non-active Voices: passive and middle. *Journal of Linguistics*, 48:1–34
   5. Schäfer, F., 2012a. Two types of external argument licensing – the case of causers. *Studia Linguistica*, 66(2):128–180
   6. Schäfer, F., 2012c. The passive of reflexive verbs and its implications for theories of binding and case. *Journal of Comparative Germanic Linguistics*, 15(3):213–268

(b) **Other publications**
   1. Alexiadou, A. & F. Schäfer, 2013. Towards a non-uniform analysis of naturally reflexive verbs. In *Proceedings of WCCFL 31*
   2. Spathas, G., 2013. Reflexive anaphors and association with focus. In Snider, T., (ed.), *Proceedings of SALT 23*, pp. 376–393, Cornell, 2013. CLC Publications

3.4   Research plan

3.4.1   Research questions and aims

B6's general aim is to develop a model of verbal meaning composition which can capture the intricate relationship between argument structure alternations and Voice morphology. In phase 3, B6 will apply the model of Voice and event decomposition that we put forth in phase 2 to the domain of psych verbs. Psych verbs predicate some mental state of one of their arguments, which is called **experiencer**. The literature on psych verbs, following Belletti & Rizzi (1988), recognizes that these are sub-divided into **three classes**. Class I verbs involve a nominative experiencer and an accusative stimulus, as in *John*

loves Mary (SubjE). Class II ones involve a nominative stimulus and an accusative experiencer, as in *Mary amused Bill* (ObE$_{acc}$). Class III predicates involve a nominative stimulus and a dative experiencer, as in *The idea appealed to Bill* (ObE$_{dat}$). The main **goals of B6 in phase 3** are defined as follows:

   A. To identify the **morphosyntactic building blocks** of psych predication.
   B. To specify the **division of labor between templatic (= morpho-syntactic) structure and conceptual information** in the domain of psych predication and locate it within the model of Voice developed in phase 2.
   C. To provide a model of how this division of labor (a) gives rise to the observed **intra- and cross-linguistic variation** in the expression of psych predication and (b) resolves the ubiquitous **ambiguities** that arise in this domain.

An interplay of three factors determines subsets of psych verbs. First, psych predicates exhibit unusual non-uniformity in the position in which the experiencer can be merged in syntax, giving rise to the three morphosyntactic construals observed by Belletti & Rizzi (1988). Predicting this variation has been called the *Linking Problem* and has been the main concern of the literature in this area (see e.g. Grimshaw 1990; Pesetsky 1995; Anagnostopoulou 1999; Reinhart 2001; Arad 2002; Landau 2010). Second, in addition to these three construals, certain non-agentive Class II predicates in many languages appear to enter a transitivity alternation, the intransitive variant of which surfaces with a marking identical to the one found in the causative alternation. Three forms of such SubjE variants have been identified in Greek, Romanian and Hebrew (Reinhart 2001; Doron 2011; Alexiadou & Iordachioaia submitted). **In the first type**, the SubjE variant surfaces with NAct morphology, and the stimulus argument is introduced via a PP (1a), similar to the one introducing causers in anticausative structures. **In the second type**, the SubjE variant appears with active morphology, and the stimulus argument is again introduced via a causer PP. This type of alternation is restricted to just a few verbs in English, e.g. *Lucy worries about something*, which makes use of adjectival constructions instead. However, in English the PP in such SubjE variants is interpreted as a subject matter (Pesetsky 1995). **In the third type**, the SubjE variant bears NAct morphology, but the stimulus argument is introduced by a special preposition, namely *ja* 'for' (1b), and is not a causer but a subject matter/object of emotion. The intricate relationship between Voice and psych predicates is further highlighted by the fact that certain Class I predicates are transitive deponents in Greek, Alexiadou (2013).

(1) a. O   Janis enohlithike   (me tin apofasi).   b. O   Janis endiaferthike   ja ta fita.
        the John annoyed.NACT with the desision   the John interested.NAct for the plants
        'John got annoyed at the decision.'   'John was interested in plants.'

Third, we find aspectual ambiguities (stative vs. eventive readings) in at least Class I and Class II. Certain Class II verbs are **three-way ambiguous** between a stative, an eventive-causative, and an eventive-agentive reading. We also find variation within individual classes: while some verbs of class III and II are stative, others are eventive. These ambiguities are often interconnected with the nature of the stimulus argument at least in class II (agent/causer/subject matter) (see e.g. Grimshaw 1990; Pesetsky 1995; Reinhart 2001; Härtl 2001; Ehrich 2002; Pylkkänen 2000; Primus 2003; Kutscher 2009; Verhoeven 2010).

Summarizing, there are at least two sources of **variation** in the domain of psych predication **within a language**. First, predicates with apparently similar thematic properties can appear in different morphosyntactic construals. Second, participation in one of the classes described above does not guarantee similarity of aspectual behavior. **Across languages** there are at least three sources of variation. First, alternations of the type described above are not necessarily all present in every language, e.g., they are not productive in English. Second, cognates of different psych predicates across languages do not behave uniformly and not all languages classify the same set of psych concepts as belonging to the same class. Third, it is not clear whether thematic roles appear with the same morpho-syntactic marking across languages. Previous literature has dealt with only parts of the variation in the psych domain in an isolated and usually language-specific fashion. Moreover, different tests have been used for different languages and, often, the same tests are used to detect different properties of psych predication. This has led to a number of analyses that make use of assumptions that are specific to psych predicates or specific to individual languages, making crosslinguistic comparison very difficult.

The **guiding hypothesis** of B6 in Phase 3 is that the observed variation in the domain of psych predication is predictable and can be attributed to independently identifiable properties of the building blocks of word meaning and the way these interact with the conceptual information associated with the relevant roots. A corollary of our hypothesis, if correct, is that variation across languages cannot be attributed to language-specific properties of psych predicates, contra Grafmiller (2013), but rather to independent differences in the availability and the workings of templatic structure. Hence, large scale crosslinguis-

tic investigations that carefully explore the range and the domain of possible variation are essential to tease apart the contribution of templatic structure and conceptual information, since they can identify the properties that are common across languages and can, thus, be systematically accounted for on the basis of well-understood grammatical principles that have been described for other verb classes. The same is true for variation within individual languages. The **novelty** of our approach is that we propose to approach the domain of psych predication by shifting the focus from the *Linking Problem* to AS alternations (see Engelberg to appear), and importantly to Voice. B6 is in a particularly advantageous position to pursue such a research program. Not only have we identified a number of tests to detect morpho-syntactic building blocks and their meaning contribution, but we have developed a unified system of Voice and AS alternations that makes cross-linguistic comparison possible and informative. Our guiding hypothesis leads us to the following two concrete hypotheses with regard to AS alternations in the psych domain, the second one following Alexiadou & Iordachioaia (submitted):

- **Hypothesis 1**: There are no AS alternations specific to the domain of psych predication.
- **Hypothesis 2**: The alternation between ObE_{acc} and SubjE predicates depends on the same building blocks identified for the (anti-)causative alternation: (i) ObE_{acc} predicates include Active Voice, (ii) morphologically marked SubjE variants include EV, whereas (iii) morphologically unmarked SubjE variants involve no Voice layer.

Several things follow from Hypothesis 2. For instance, we can explain why SubjE variants will bear the same marking as canonical anticausatives. Marked SubjE variants in Greek will involve NAct morphology, as in (1), which is the exponent of EV and is syncretic as a result of **morphological underspecification**. In German(ic) and Romance, we expect marked SubjE variants to be reflexively marked (i.e. to involve EV). Syncretism in this case is the result of the **syntactic underspecification** of SE-reflexives, as described in 3.3.1. Hypothesis 2 is independent of the aspectual properties of the predicates involved. Thus, we can capture that SubjE variants of certain ObE_{acc} predicates are similar to each other (and anticausatives) in morphological marking (1a-b), but differ in aspectual properties, e.g. (1b) and its transitive variant are stative, whereas (1a) expresses a change-of-state (Alexiadou & Iordachioaia submitted). (1a) then is a real 'psych anticausative', as it expresses a change-of-state like canonical anticausatives. As observed above, like canonical anticausatives, it also licenses causer PPs that introduce the non-experiencer argument. We predict then that in German(ic) and Romance, change-of-state SubjE variants will also license the same prepositions as canonical anticausatives (e.g. German *durch* 'through'). What needs to be explained is why English lacks a productive alternation between ObE_{acc} and SubjE predicates, even though it has the causative alternation in the non-psych domain.

As ObE_{acc} predicates share properties with the two other classes of psych verbs, it is essential for the aims of this project that we identify the subclasses of predicates that belong to the different classes both within and across languages. Our empirical investigation will, thus, expand as necessary. In order to fully determine how conceptual information and templatic structure interact in the context of psych predications, we will further investigate how non-psych predicates can get a psych interpretation.

3.4.2 Methods

We work within the de-compositional morphosyntactic framework of Distributed Morphology and apply *crosslinguistic comparison* between languages in combination with in-depth analyses of individual languages: Germanic (English and German), Romance (French and Romanian) and Greek. On the interpretational side, we employ standard model-theoretic semantic mechanisms of composition, adopting neo-Davidsonian frameworks as developed, e.g., in Kratzer (1996). We will carry out our empirical investigation on the basis of *data questionnaires*, as well as *corpora*. We will work with truth-value judgments, and Likert-scale judgments (e.g. on a 7-point scale). For our synchronic investigations, we will use the Corpus of Contemporary American English, British National Corpus, COSMAS, the Greek newspaper corpus available online as well as the parsed corpora available at the ILR for French, the list of French psych verbs compiled in B5, the corpora available at the IMS, and the corpus of Greek deponents and the multi-lingual database of psych predicates compiled in B1. For our diachronic investigation, we will use the York-Toronto-Helsinki Parsed Corpus of Old English Prose, the Penn Parsed Corpus of Middle English, Corpus of Middle English Prose and Verse and the Parsed Corpus of Early English Correspondence. Our corpus search will be executed partly in collaboration with A2 and D12; the multi-level model (MLM) developed in that project and its half-context representations will be employed to investigate the behavior of psych verbs. In particular, we will determine the (half-contextual) distributional properties of these verbs with respect to the objects and subjects they take. A2 will help us establish the distributional characteristics of the subjects in the intransitive variants of psych verbs. This achieved, we will use the hierarchical agglomerative clustering over these distributions, constructed in

A2 in order to arrive at a taxonomy of psych verbs. The resulting dendrogram will help us in investigating our hypotheses concerning verb subclasses in Voice alternations. In addition, the MLM will be employed to assess the gradient grammaticality of the sentences generated in B6. D12's WP 3.2 develops and compares various ways to automatically generalize over nouns. Their model will help us characterize the nominal arguments of our psych verbs (e.g., as agentive vs. non-agentive). In addition, D12 will use the alternations of the German and English psych verbs (focusing on psych particle verbs) as test cases for their methodology. In our case, this methodology should be applicable to the meaning shifts triggered by the presence of a particle (e.g. *regen* vs. *aufregen*). To strengthen experimental methodology in B6, we will cooperate with E. Verhoeven's DFG project *Syntaktische und semantische Prominenz von Experiencern im Sprachvergleich* (Berlin); we will further inform our investigations by work by Bornkessel (2002, and subsequent work), Bott & Solstad (to appear), Grafmiller (2013), Primus (2010), Scheepers et al. (2000) among others, who have carried out neuro- and psycholinguistic experiements involving psych predicates.

3.4.3   Working program

WP 1: The morphosyntactic construals of psychological predicates
In this WP we plan: (i) to deliver an overview of the available morphosyntactic construals for psych predication in the languages under investigation, which will serve as the basis for our investigations for the rest of the project; (ii) to define the thematic roles involved in each construal in each language and provide an overview of how these thematic roles are realized; (iii) to identify the subclasses of psych verbs that participate in the various construals in each language. Thus, we will obtain a first categorization of psychological predicates into subclasses according to the construals they participate in, and we will arrive at a first picture of the behavior of the cognates of psych predicates across languages.

WP 2: Psychological predicates and event structure
In this WP we plan: (i) to provide an overview of the Aktionsart properties of the different morphosyntactic construals across languages; (ii) to identify which predicates form subclasses based on Aktionsart diagnostics and which are ambiguous between eventive (agentive and non-agentive) and stative readings within and across languages; (iii) to identify how the classes identified in WP 2 map onto the ones identified in WP 1; (iv) to identify the locus of the Aktionsart properties of psych predicates and specify whether these properties are specific to psych predications; (v) to provide an account of the Aktionsart properties of psych predications that predicts their interaction with thematic and templatic structure and the range of variation found.

In the case of ObE_{acc} predicates, almost all analyses argue for some grammatically relevant distinction between stative and non-stative ObE_{acc}, although there is disagreement on whether all non-agentive ObE_{acc} verbs should be taken to be stative. Grafmiller (2013), contra Landau (2010), shows that any English ObE_{acc} verb can be used to describe a dynamic event. Klein & Kutscher (2002) showed that German ObE_{acc} predicates split into various classes with respect to Aktionsart. In languages such as Romanian and Greek both agentive and non-agentive variants of certain ObE_{acc} verbs are change-of-state predicates Alexiadou & Iordachioaia (submitted), cf. Marín & McNally (2005) for Spanish, Martin (2006) for French.

We assume that the licensing of external and internal arguments is correlated with templatic information, which, in turn, determines the event structure of a predicate. We will determine the event structure properties of agentive and non-agentive ObE_{acc} predicates across languages, in comparison to the other classes of psych verbs on the basis of well-known diagnostics in collaboration with B5 (e.g., modification with *again*, result state modification). To determine to what extent the existence and the nature of this ambiguity is restricted to psych predicates, we will compare the class of ambiguous psych predicates with non-psych predicates that are subject to eventive/stative ambiguities (Rothmayr 2009). According to our guiding hypothesis, we expect the availability of eventive/stative ambiguities to be the same in both the psych and non-psych domains. This can also help us identify the locus of stativity/eventivity, i.e. whether it is a property of the root or introduced by functional structure (see Alexiadou et al. to appearc). Concerning the licensors of arguments, several analytic possibilities can be formulated. It could be argued that the experiencer argument is an argument of the root (Doron 2011). While this might be correct for ObE_{dat}, ObE_{acc} predicates and SubjE variants of ObE_{acc} verbs, it is not clear that it holds for SubjE-only predicates (*love, hate*). In principle, such predicates could involve a particular type of Voice, named holder in Kratzer (1996). Landau (2010) proposes that experiencers are oblique NPs. However, they do not seem to behave as oblique NPs across languages, see Grafmiller (2013) and Verhoeven (2008). It could also be argued that experiencers are introduced by Applicative heads (Pesetsky 1995, Pylkkänen 2002), an analysis relevant in the context of psych deponents (Alexiadou 2013). Turning to the stimulus

argument, while it is an internal argument in Class I and Class III predications, its status with Class II predicates is less clear. Agentive stimulus arguments are canonical external arguments. However, non-agentive stimulus arguments belong to two types, they are either causers or subject matters/objects of emotion, and thus they could be arguments of the root (Doron 2011), holders introduced in Voice, or causers introduced by v, Schäfer (2012b), Alexiadou (2014). A similar question arises for the PPs introducing stimuli in SubjE variants: causer PPs are introduced by v, but subject matter PPs could be root arguments, as they remain stable in the context of root derived nouns.

To determine the locus of external and internal arguments, we will use the battery of diagnostics developed in Phase 2. For example, we will investigate which passivization strategies are available in the context of psych predicates. As known, however, transitivity does not always correlate with the availability of passivization. In German, at least some unaccusatives can passivize, and this is correlated with a shift in their aspectual properties (Primus (2010)); thus it is not necessarily true that if a predicate can form a passive, it involves a canonical external argument. The behavior of psych verbs in relation to PoRs in German will be helpful in addressing this.

WP 3: Psych predicates, Voice and the (anti-)causative alternation

In this WP we aim to: (i) to compare the subclasses of bi-eventive ObE_{acc} and bi-eventive SubjE verbs within and across languages in order to identify the subclasses of alternating verbs and the subclasses of verbs that only participate in a single morphosyntactic construal; (ii) to map those subclasses on the subclasses of verbs exhibiting alternating and non-alternating non-psych bi-eventive readings; (iii) to examine the role of prepositions in SubjE variants; (iv) to identify the subclasses of SubjE verbs that surface with NAct/reflexive morphology in the languages under investigation and identify how they map onto the subclasses identified in WP 1 and WP 2; (v) to provide a formal account of Voice morphology for SubjE verbs based on the typology of Voice developed in Phase 2.

According to Hypothesis 2, we expect the availability of the alternation with psych predicates to be determined by factors similar (though not identical) to those regulating the alternation in the non-psych domain. As is well-known, the canonical causative alternation is conceptually restricted in that by far not all change-of-state verbs participate in it and we expect such conceptual restrictions to apply in the psych domain, too. However, as mentioned above, many psych verbs that enter the alternation do not express a change of state, (1b), and we expect these aspectual differences to influence the conceptual restrictions on the psych alternation. In order to determine to what extend the restrictions found in the psych domain are identical to or differ from those in the non-psych domain, we thus need to diagnose which of the verbs entering the alternation include a causative component. One basic tool we have developed to detect such a component involves prepositions. As described above, in Greek, bi-eventive anticausatives and SubjE variants can include causer PPs introduced by *me* 'with'; others, identified as stative on the basis of Aktionsart tests, use the preposition *ja* 'for' (Alexiadou & Iordachioaia submitted). For ambiguous verbs, the use of prepositions disambiguates. In English, which seems to lack the psych causative alternation, certain SubjE variants are activities, and thus behave like unergative predicates (Marelj 2013), opening up the possibility that they can fall under our treatment of English NRVs reported in section 3.3.1. We will investigate the status of SubjE variants in German and French (together with B5) with respect to prepositions in order to see how they fit into the model developed in phase 2. Finally, as mentioned, NAct/reflexive morphology surfaces with many SubjE-only verbs (e.g. Kutscher 2009, Wegener 1999 for German), and even in transitive construals (Greek deponents). These pose a challenge to our Hypothesis 2 and thus our model should expand to accommodate them.

WP 4: The diachrony of psych predicates in English

In this WP, we aim to determine why English lacks the psych causative alternation. Given that English has bi-eventive ObE_{acc} verbs and manifests the causative alternation in the non-psych domain, this gap seems challenging for Hypothesis 2. The literature on the diachrony of English psych verbs has discussed (i) the loss of Case morphology, (ii) the loss of productive lexical-causative morphology, and (iii) the absence of labile alternations in the psych domain. Most importantly for our purposes, it has made the observation that Old English had 'reflexively' marked SubjE verbs (both alternating and non-alternating). Crucially, the pronoun also served to mark canonical reflexive verbs at that time, i.e. it seems to work like SE-reflexives in German and Romance. As is well-known, later English replaced pronouns in reflexive context with the SELF-reflexive 'himself'. From the perspective of B6, this means that the pronoun lost its use as a non-referential variable and, as a consequence, could also no longer act as an expletive in the specifier of EV. Following van Gelderen (2012), we pursue the hypothesis that the gap can be attributed to the diachronic loss of morphological marking, among others, the marking associated with 'decausativization' (i.e. EV in our terms) combined with a general tendency to avoid labile marking in the domain of the psych causative alternation. To substantiate this hypothesis, we

will investigate, in collaboration with Dr. Susanne Lohrmann, the causative psych alternation as well as marked SubjE verbs in Old English. We will examine how (and when) the changes in causativization strategies and the Voice system influenced the behavior of English ObE$_{acc}$ and SubjE predicates, and whether the reanalysis of several of these predicates correlates with a shift in the reflexive system of the language. This can only be addressed after a systematic investigation of Old English reflexive pronouns in the context of the Voice typology in B6. Here, we will profit from the work of, among others, König & Siemund (1997, 2000), Bergeton & Pancheva (2012).

WP 5: Meaning shifts and psychological predication
In this WP we aim: (i) to identify the classes of non-psych verbs that can be shifted into psych interpretations; (ii) to provide an overview of the thematic, templatic and Aktionsart properties of these predicates and identify any formal characteristics that may determine participation in this class; (iii) to identify the morphosyntactic construals used in their psychological uses and determine if/ how those are constrained by their properties in non-psych uses.
Van Voorst (1992), Wegener (1999), Primus (2003), Kutscher (2009) and others observe that several predicates are ambiguous between a physical and a psych interpretation (e.g. *John hit Bill* and *The critics hit him hard*). Such cases allow us to determine straightforwardly which of the properties discussed in the previous WPs are due to specific features of psych predicates and which are due to the interaction of more general cognitive properties. An examination of such shifts will help determine the contribution of the encyclopedic information associated with roots in psych predication. Such shifts are commonly associated with specific morphosyntactic features. In Greek, e.g., change-of-state verbs can shift into ObE$_{acc}$ interpretations, but only if the experiencer is clitic-doubled, raising questions concerning the function and syntactic status of clitic-doubling. Furthermore, several change-of-state predicates can receive a psych interpretation in combination with reflexive pronouns or NAct (e.g. Greek *spastika* 'break-NAct-1sg' 'I got annoyed'). This raises questions concerning the contribution of reflexives and NAct morphology to the building of psych interpretations, and our Hypothesis 2.

Timeline:

2/2014	1/2015	2/2015	1/2016	2/2016	1/2017	2/2017	1/2018
	WP1, WB2, WP3						
				WP3, WP4			
						WP4, WP5	

3.5 Role within the Collaborative Research Centre

Project B6 in close collaboration with B1 examines the building blocks of verbal meaning by looking, on the one hand, at properties of local interfaces, e.g. syntax-morphology, syntax-lexicon, and syntax-semantics, and on the other, at the ways in which morphosyntactic representations are mapped to/relate to conceptual knowledge. Together with the other projects in Area B, it contributes to a better understanding of the division of labor in the overall architecture of grammar and its interaction with conceptual knowledge in the treatment of verbal ambiguity and it will further explore the two strategies of **under-specification** to deal with this ambiguity identified in phase 2. With C2 we discussed argument alternations concentrating on issues of the syntax-semantics interface. B6 has been engaged in lively collaborations with all projects in area B (regular meetings and joint publications) as well as with project D2 (Linguistic Evidence talk). These collaborations will continue and be complemented by collaboration with projects A2, D12, outlined above, the results of which will feed INF. Our interaction with B8, which investigates a complementary set of non-canonical alternations, will contribute to our integrative theory of Voice (WP2/WP3). In line with the main research goals of the SFB in phase 3, B6 focuses on data which are highly variable and irregular across languages. The addition of a diachronic perspective also fits this turn, due to the well-known limitations associated with diachronic investigations.

3.6 Delineation from other funded projects

Project B6 shares some of its theoretical concerns with project AL 554/7 *The acquisition of Voice alternations by bilingual children*. AL 554/7 aims to study the development of Voice alternations in Greek-German bilingual children. It is expected that the theoretical results of B6 will inform the formulation of hypotheses in AL 554/7, whose experimental results will feed the theoretical modeling in B6.

3.7 Project funds

3.7.1 Previous funding

The project has been funded within the Collaborative Research Centre since 07/2010.

3.7.2 Funds requested

B6 (C)	2014/2		2015		2016		2017		2018/1	
Staff	Qty.	Sum	Qty.	Sum	Qty.	Sum	Qty.	Sum	Qty.	Sum
Postdoc, 100%-Satz	1,65	51.300	1,65	102.500	1,65	102.500	1,65	102.500	1,65	51.300
Total		51.300		102.500		102.500		102.500		51.300
Total		51.300		102.500		102.500		102.500		51.300

(All figures in Euro)

3.7.3 Staff

B6 (C)	No.	Name, academic degree, position	Field of research	Dept. of university or non-university institution	Commit-ment in hrs/week	Category	Funded through:
Available							
Research staff	1	Artemis Alexiadou, Prof. Dr.	Theoretische Linguistik, Anglistik, Syntax, Morphologie	IfLA	5		GA
	2	Susanne Lohrmann, Dr. wiss. Mitarbeiterin	Theoretische Linguistik, Anglistik, Syntax, Morphologie	IfLA	5		GA
	3	Marcel Pitteroff, wiss. Mitarbeiter	Theoretische Linguistik, Syntax, Semantik	IfLA	5		GA, Hoch-schul-aus-baupro-gramm
	4	Giorgos Spathas, Dr.	Theoretische Linguistik, Semantik	IfLA	35% HRS.!		Hoch-schul-aus-baupro-gramm
	5	N.N., stud. Hiwi	Theoretische Linguistik, Anglistik, Syntax, Morphologie	IfLA	10		GA
Requested							
Research staff	6	Florian Schäfer, Dr.	Theoretische Linguistik, Syntax, Morphologie	IfLA		Postdoc	
	7	Giorgos Spathas, Dr.	Theoretische Linguistik, Semantik	IfLA		Postdoc	

Job description of staff (supported through available funds):

1 Prof. Artemis Alexiadou: Principal investigator
Co-ordination of research. Work on the diachrony of English, and on the interaction of roots with templatic information; work on psych predicates in Greek.
2 Dr. Susanne Lohrmann: work on the diachrony of English; corpus search
Advise project on the diachrony of English and English corpora searches.
3 Marcel Pitteroff: psych predicates in German (passivizability, embedding under *lassen*)
Advise project on German psych predicates
4 Dr. Giorgos Spathas: Post-Doc, 35%
Semantic modelling of psych predications
5 NN (stud. HK)
Responsible for corpora searches and questionnaires

Job description of staff (requested):
6 Dr. Florian Schäfer: Post-Doc, 100%
Work on syntax-morphology interface tests for event decomposition of psych predication. Work on German psych predications in comparison to English, Greek and Romance; passivization of unaccusative predicates
7 Dr. Giorgos Spathas. Post-Doc, 65%
Work on Greek psych predications in comparison to German, English, and Romance; semantic tests for event decomposition, work on reflexives in the diachrony of English.
Dr. Schäfer and Dr. Spathas together with the project co-ordinator will expand the model of Voice developed in B6 to capture the properties of psych predications.

3.7.4   Direct costs

B6 (C)	2014/2	2015	2016	2017	2018/1
Funds available	500	1.000	1.000	1.000	500
Funds requested	-	-	-	-	-

(All figures in Euro)

Travels (money will be applied for centrally): we apply for 3.800 EUR/year (1.900 EUR in 2014/2 and 2018/1) to enable our project staff to travel to national and international conferences (e.g. NELS, WC-CFL, GLOW, SuB, SALT) and present the results of the work carried out in the project to the international scientific community.

Guests/workshops: The project will contribute to the planned workshops and will invite guests for the guest lecture series – money for these activities will be applied for centrally.

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