„What is a Verb?":

An International Conference on the Cross-linguistic Comparison of Indo-Germanic and Semitic Languages

July 26th – July 28th 2017 in Konstanz, Germany

Organizers: Eva Smolka & Dorit Ravid

Sponsors: Exzellenzinitiative Universität Konstanz
             Volkswagen Stiftung

Time	Wednesday, 26th of July	Thursday, 27th of July	Friday, 28th of July
		Session 1 **Particle and prefix verbs**	**Session 1** **Noun-Verb Relation**
09:00 - 09:40		Talk 1 Springorum	Talk 1 Augustin
09:40 - 10:20		Talk 2 Günther	Talk 2 Rabanus
10:20 - 11:00		Talk 3 Frassinelli	Talk 3 Laks
11:00 - 11:30		**Coffee and Discussion**	**Coffee and Discussion**
		Keynote	**Keynote**
11:30 - 12:30		Thim	Keuleers
12:30 - 14:00		**Lunch**	**Lunch**
	Session 1 **Input CDS - Output CS**	**Session 2** **Particle and Prefix Verbs**	**Session 2**
14:00 - 14:40	Talk 1 Ashkenazi, Ravid & Gillis	Talk 1 Bradley	Talk 1 Gutman
14:40 - 15:20	Talk 2 Johnson	Talk 2 Mattes	Talk 2 Kanaan
15:20 - 16:00	Talk 3 Ravid, Ashkenazi et al.	Talk 3 Voeikova	
16:00 - 16:30	**Coffee and Discussion**	**Coffee and Discussion**	**Trip to Meersburg**
	Session 2 **Verb Binyanim**	**Session 3** **Verb Transitivity**	meeting point 16:00 at the bus stop "Bahnhof/train station", Bus Nr.1 leaves at 16:16 to Staad/Fähre from where we cross the lake with the ferry to Meersburg (return ticket 5,50€); we can visit the castle (entrance 12,50€) and stroll through the historic old town of Meersburg
16:30 - 17:10	Talk 1 Ravid, Balazs & Calmy	Talk 1 Salzberg	
17:10 - 17:50	Talk 2 Ashkenazi, Shisman & Levie	Talk 2 Schröder	
	Welcome Reception	**Sunset Cruise**	**Meersburg**
Evening Programme	**18:30 reception** at the University	**19:00 boarding of cruise by "Schifffahrt Giess"** from Constance harbor close to the statue 'Imperia'; 20€/person (incl. Snacks)	**18:30: restaurant of the "state winery Meersburg"**: a table on the terrace overlooking the lake is waiting for us

Input-output relations in the morpho-lexical acquisition of Hebrew verbs

Orit Ashkenazi[1], Dorit Ravid[1] & Steven Gillis[2]
[1] Tel Aviv University, [2]Antwerp University

Grounded in empiricist usage-based approaches to language learning (Tomasello, 2009), which attribute importance to lexical and morpho-syntactic distributions in the ambient language as major contributors to children's linguistic development (Behrens, 2006), the present study examines Hebrew verbs in CDS [Child Directed Speech]-CS [Child Speech] relations. It focuses on the interface of verb morphology and semantics in Hebrew, where the morphological and lexical features of the verb are interrelated and many grammatical and lexical notions are encoded in verb-internal structures (Berman, 1981; Ravid, 1995).

Verbs were analyzed in a new corpus of three weekly 45-60 minute recordings of a boy dyad and a girl dyad, between the ages 1;8-2;2 in natural interactions. Recordings were transcribed in CHAT format and coded by the Hebrew MOR. The CDS corpus consisted of 299,461 word tokens which included 54,849 verb tokens and 700 verb lemmas. The CS corpus consisted of 72,086 word tokens which included 7711 verb tokens and 256 verb lemmas.

The following Hebrew specific verb component were examined in CDS and CS: roots and root categories*, binyan* patterns, verb lemmas and root- *binyan* families. Derived values of MSP (mean size of paradigm – a measure of inflectional diversity) and lexical age (the number of new verb lemmas) were also calculated for every day of recording.

Findings point at the centrality of CDS as the child's main source of information regarding the verb's lexical and morphological features and their unique interrelations in Hebrew, and at various CDS-CS relations. CDS MSP rose with children's age. Verbs in CDS and consequently in CS appeared mostly as singletons, that is one verb per root, highlighting the lexical nature of early Hebrew verb acquisition. However, lexical and inflectional morphological development were interrelated. CS verb inflection as measured by MSP rose in tandem with CDS lexical age and interesting relations were revealed between root types in CS and CDS MSP.

References

Behrens, H. (2006). The input output relationship in first language acquisition. *Language and Cognitive Processes*, 21, 2-24.

Berman, R.A. (1981). Language development and language knowledge: Evidence from acquisition of Hebrew morphophonology. *Journal of Child Language,* 8, 609-26.

Ravid, D. (1995). *Language change in child and adult Hebrew.* New York: Oxford University Press.

Tomasello, M. (2009). The usage based theory of language acquisition. In E. L. Bevin (Ed), *The Cambridge handbook of child language*. Cambridge: Cambridge University Press, 69-88.

Morphological causatives in Hebrew verbs: Input-output relations in early childhood

Orit Ashkenazi, Maayan Shisman Dagan & Ronit Levie
Tel Aviv University

Causation is defined as "causing an event or change of state [by an agent] in another participant" (Croft, 2012: 188; Dowty, 1991). The current study investigated the sources of knowledge available to Hebrew-speaking toddlers regarding high-transitivity events morphologically encoded in verbs. While causativity can of course be expressed non-morphologically through a verb's basic lexical semantics (e.g., *shavar 'break'* or *harag '*kill' in *Qal*), the fact that Hebrew associates high-transitivity and causation with two particular *binyan* patterns highlights their importance in child language acquisition (e.g., *Hif'il hixnis* 'introduce' and *Pi'el kines* 'gather,Tr'). We hypothesized that *Hif'il* would reveal a higher degree of causativity than *Pi'el*, as it takes more accusative arguments and di-transitive constructions, and as contrasting with basic *Qal* and middle-voice *Nif'al*. *Pi'el*, in contrast, serves as the basic form in its sub-system, as well as being key in denominal derivations, in addition to its causative role in contrast to *Hitpa'el*.

To this end, all *Hif'il* verb tokens (8040 in CDS, 822 in child speech respectively) and types (120 in CDS, 47 in child speech), and *Pi'el* verb tokens (4782 in CDS, 359 in child speech) and types (145 in CDS, 43 in child speech) were extracted from the corpus. Each token was ranked on a scale of 0-3, from intransitive (e.g., *hexlik* 'slide') to causative (*he'exil* 'feed') by six raters. Results showed that the majority (60%) of *Hif'il* and *Pi'el* types and tokens were either highly causative (rank 3) or slightly less causative (rank 2). Only 18% of types and tokens were not causative at all. Rank distributions in the two *binyan* patterns were very similar, so that our hypothesis was not confirmed: both CDS and CS are highly transitive. While parents used verbs from all ranks throughout in the frequency order of 3>2>1>0, children did not use all ranks. A developmental trend indicated that the variety of types and ranks increased with age. Thus, as indicated in other developmental input-output studies, parents' input is more variegated and more even throughout, while children's output starts to approximate parental variation at the end of the recording period.

References

Berman, R.A. 1993. Marking of verb transitivity by Hebrew-speaking children. *Journal of Child Language,* 20, 641-669.

Ashkenazi, O., D. Ravid & S. Gillis. 2016. Breaking into the Hebrew verb system: a learning problem. *First Language,* 36, 505 –524.

Berman, R.A. & Nir-Sagiv, B. 2004. Linguistic indicators of inter-genre differentiation in later language development. *Journal of Child Language,* 31, 339-380.

Comrie, B. 1976. *Aspect: An introduction to the study of verbal aspect and related problems.* Cambridge: Cambridge University Press.

Croft, W. 2012. *Verbs: Aspect and causal structure*. Oxford: Oxford University Press.

Dowty, D. 1991. Thematic proto-roles and argument selection. *Language*, 67, 547–619.

Kibrik, A. 2012. Toward a typology of verbal lexical systems: A case study in Northern Athabaskan. *Linguistics*, 50, 495–532.

Koptjevskaja-Tamm, M. 2012. New directions in lexical typology. *Linguistics*, 50, 373–394.

Ravid, D., O. Ashkenazi, R. Levie, G. Ben Zadok, T. Grunwald, R. Bratslavsky & S. Gillis. 2016. Foundations of the root category: analyses of linguistic input to Hebrew-speaking children. In R. Berman (ed.) *Acquisition and development of Hebrew: From infancy to adolescence* (pp. 95-134). Amsterdam: John Benjamins.

Talmy, L. 2007. Lexical typologies. In T. Shopen (Ed.) *Language typology and syntactic description. Vol III, Grammatical categories and the lexicon* (pp. 66-168). Cambridge: Cambridge University Press.

Vendler, Z. 1957. Verbs and times. *The Philosophical Review*, 66, 143-160.

Effects of semantic opacity and irregularity in German verbs: masked priming at variable SOAs

Luke Bradley
University of Freiburg

The German lexicon is characterized by a great deal of productivity and reuse of sublexical material. This is true not only of compounding, which is typologically unremarkable, but also of inflected and derived verbs. The latter are of particular relevance to morphological processing, and specifically to the question of holistic versus decompositional lexical access. The prolific reuse of roots and affixes in verbal inflection and derivation found in German contrasts with isolating languages in the extreme case, but also with well-studied and phylogenetically closer languages such as English and French. The relationship of morphologically complex words to the recurrent sublexical forms they contain may differ along several dimensions. The dimensions of regularity in inflection and semantic transparency in word-formation have recently received attention in the literature on German morphological processing (Clahsen 1999; Smolka et al 2007, 2009, 2014). The question is whether the modulation in processing ease and/or mechanism which results from the manipulation of these variables in other Indo-European languages is also operative in German. The alternative is that German lexical access involves mandatory decomposition and stem retrieval, even in the case of irregularly inflected verbs, or semantically opaque derived verbs.

I will present two sets of behavioural results aimed at addressing the unresolved question of mandatory decomposition in German lexical processing, both using a masked-primed lexical decision task. The setup tested for a) regularity effects in past participles used to prime their corresponding infinitives (gemeint-MEINEN; genannt-NENNEN [thought-THINK, regular; named-NAME, irregular]), and b) semantic transparency effects in derived verbs used to prime their corresponding 'root' verbs (anhören-HÖREN; aufhören-HÖREN [listen-HEAR, transparent; stop-HEAR, opaque]). An important feature of the design was the employment of systematically varying prime durations (33, 50, 67 msec). This was motivated by the finding that semantic transparency effects are observable early in the time-course of processing in English, and may differ significantly in magnitude even over very small increments in prime duration (Feldman et al 2015). Our results show significant effects of regularity with 67 msec primes only, in contrast to previous behavioural results obtained with longer-lag priming, but no apparent effect of semantic transparency at any prime duration, in contrast to what was found for English. In interpreting these results, I shall additionally highlight the need for sensitivity to gradience in both regularity (Albright & Hayes 2003; Marantz) and semantic transparency (Günther, Dudschig & Kaup 2016), including the potentially differing aspects of transparency captured by participant ratings and corpus-based distributional methods (Gagné, Spalding and Nisbet 2016).

References:

Albright, A. & Hayes, B. (2003). Rules vs. analogy in English past tenses: A computational/experimental study. Cognition, 90(2), 119–161.

Clahsen, H. (1999). Lexical entries and rules of language: A multidisciplinary study of German inflection. Behavioral and Brain Sciences, 22(6), 991–1013.

Feldman, L. B., Milin, P., Cho, K. W., Moscoso del Prado Martín, F., & O'Connor, P. A. (2015). Must analysis of meaning follow analysis of form? A time course analysis. Frontiers in Human Neuroscience, 9.

Fruchter, J., Stockall, L., & Marantz, A. (2013). MEG masked priming evidence for form-based decomposition of irregular verbs. Frontiers in Human Neuroscience, 7.

Gagné, C. L., Spalding, T. L., & Nisbet, K. A. (2016). Processing English compounds: Investigating semantic transparency. SKASE Journal of Theoretical Linguistics, 13(2).

Günther, F., Dudschig, C., & Kaup, B. (2016). Predicting lexical priming effects from distributional semantic similarities: A replication with extension. Frontiers in Psychology, 7.

Smolka, E., Komlosi, S., & Rösler, F. (2009). When semantics means less than morphology: The processing of German prefixed verbs. Language and Cognitive Processes, 24(3), 337–375.

Smolka, E., Preller, K. H., & Eulitz, C. (2014). 'Verstehen'('understand') primes 'stehen'('stand'): Morphological structure overrides semantic compositionality in the lexical representation of German complex verbs. Journal of Memory and Language, 72, 16–36.

Smolka, E., Zwitserlood, P., & Rösler, F. (2007). Stem access in regular and irregular inflection: Evidence from German participles. Journal of Memory and Language, 57(3), 325–347.

Meaning (Mis-)Match in the Directionality of German Particle Verbs

Diego Frassinelli, Alla Abrosimova, Sylvia Springorum & Sabine Schulte im Walde
University of Stuttgart

German particle verbs (PVs; e.g., *an-schieben* 'push sth. forward') are highly productive and ambiguous complex structures that combine a particle such as *an* with a base verb (BV; *schieben* 'push'). They often trigger meaning shifts of the BVs [1-2]. For example, while *an-schieben* emphasizes the horizontal direction of the pushing event *schieben*, the PV *auf-schieben* expresses a non-literal meaning ('postpone'). Our work investigates the directionality of the particles *an* and *auf*. We hypothesize that the particle *an* is primarily associated with a horizontal directionality, and *auf* with a vertical directionality. Consequently, combining the particle *an* with BVs that incorporate a horizontal direction (such as *schieben*), we expect a match between the particle and BV meanings (resulting in a literal PV). On the other hand, combining *an* with a vertical BV should result in a mismatch between particle and BV meanings (resulting in a meaning-shifted PV). Vice-versa for *auf*. Verbs in the match condition should be processed faster (facilitation) than verbs in the mismatch condition (inhibition).

To test our hypothesis, we performed a go/no-go lexical decision experiment. The primes were the particles (e.g., *an*) and the targets were the base verbs (e.g., *schieben*). A question about the type of particle used as prime was asked after each experimental trial.

On average, subjects were slower in processing a verb in the mismatch condition (768±8ms) thanin the match condition (729±10ms). We performed a LMER analysis using log-transformed RTs as the dependent variable of the model, match/mismatch as the main factor and frequency and semantic similarity as covariates, and random slope and intercept under Item and Subject. The model shows a significant difference between the two conditions ($\beta_{mismatch}$(= 0.05, p<.05).

We performed a series of qualitative analyses by item. We assume that a transition from literal to meaning-shifted readings is reflected in an increase in abstraction [3]: 13/22 verbs show this pattern. The remaining are cases where the PV in the mismatch condition is polysemous, in most cases including a shifted sense next to a synonym of the matching PV (e.g., *aufdrehen*$_{meaning\text{-}shifted}$ 'exhilarate' vs. *aufdrehen*$_{literal}$ ~ *andrehen* 'turn up').

Overall, this study strongly supports our hypothesis: it takes significantly longer to process a mismatching (inhibition) particle/BV pair than a matching (facilitation) pair. We conclude that the particles *an* and *auf* have a predominant horizontal/vertical directionality, respectively. Qualitative analyses showed that this effect can typically be attributed to meaning-shifted senses of (polysemous) PVs. Future work aims to incorporate the relation of meaning shifts and degree of PV polysemy into further investigations of particle directionality.

References:
[1] Lechler, A., & Roßdeutscher, A. (2009). German Particle Verbs with *auf*. Reconstructing their Composition in a DRT-based Framework. *Linguistische Berichte*, (220), 439-478.
[2] Springorum, S., Utt, J., & Schulte im Walde, S. (2013). Regular Meaning Shifts in German Particle Verbs: A Case Study. In *Proceedings of the 10th International Conference on Computational Semantics*, 228-239.
[3] Kövecses, Z. (2002). *Metaphor: A Practical Introduction*. Oxford University Press: NY.

Personal indices in the verbal system of the Jewish Neo-Aramaic dialect of Zakho

Ariel Gutman
University of Konstanz (currently Google Research Europe, Zurich)

The Jewish Neo-Aramaic Dialect of Zakho is a highly endangered dialect of North-Eastern Neo-Aramaic which was spoken by the Jews of Zakho (northern-Iraq) up to 1950s, when virtually all of them left Iraq to Israel. In Israel the language has been under great pressure from Hebrew, and in consequence the language has hardly been transmitted to the younger generation.

Nonetheless, thanks to documentation efforts which have started in the 50s in the Hebrew University of Jerusalem, and the interest of the native speakers themselves, we posses today a rich textual documentation of this dialect (Sabar 2002 ; Avineri 1988)

In the paper presented, we rely on these resources, as well as recent fieldwork of the author, in order to analyse the linguistic status of the verbal personal indices in this dialect, following the ideas presented by Bresnan & Mchombo (1987) as well as Corbett (2003). For each person marker, we try to establish whether it should be analysed as a personal affix or rather as an agreement marker. We compare the synchronic situation with the known historic situation in older strata of Aramaic, such as Classical Syriac.

We conclude that the same apparent person marker behaves differently in different environments. Moreover, we show that the traditional dichotomy between personal affixes and agreement marker may be over-simplified, as transitional cases exist.

Thus, the paper re-emphasizes the importance of less-studies languages, and in particular endangered languages, to the general field of linguistics.

References

Avinery, I. (1988). *The Aramaic Dialect of the Jews of Zākhō*. In Hebrew. Jerusalem:
    The Israel Academy of the Sciences and Humanities.
Bresnan, J. & Mchombo, S.A. (1987), *Topic, Pronoun, and Agreement in Chicheŵa,* Language 63/4 pp. 741-782.
Corbett, Greville G. (2003). "Agreement: The Range of the Phenomenon and the
    Principles of the Surrey Database of Agreement". In: *Transactions of the Philological Society* 101.2, pp. 155–
    202.
Sabar, Yona (2002). *A Jewish Neo-Aramaic dictionary: dialects of Amidya, Dihok, Nerwa
    and Zakho, northwestern Iraq*. Semitica viva. Harrassowitz Verlag.

Capturing systematic language differences through distributional semantics: How to explain cross-linguistic dissociations in priming effects for complex words

Fritz Günther[1], Eva Smolka[2] & Marco Marelli[3],
[1]University of Tübingen *(presenting author),* [2]University of Konstanz, [3]University of Milano-Bicocca

In studies using English item material, it has been shown that base words can be primed by semantically transparent derivations (with word pairs such as DISTRUST – TRUST), but not by semantically opaque derivations (with word pairs such as SUCCESSOR – SUCCESS) in an overt priming paradigm with long SOAs. However, recent studies employing German item material have found such purely morphological effects without a semantic relation between prime and target in the same paradigm. Hence, contrary to the English case, priming effects are observed for both transparent derivations (such as AUFSTEHEN – STEHEN, *stand up – stand*) as well opaque derivations (such as VERSTEHEN – STEHEN, *understand – stand*). It has been assumed that these results are caused by structural differences between the two languages, with German being more systematic with regards to morphology. In our study, we tested this hypothesis using distributional semantics models, where word meanings are represented as high-dimensional numerical vectors derived from the words' distributional patterns in large corpora of natural language. To this end, we employed a compositional model for affixation in distributional semantics, the FRACSS model, to obtain compositional vector representations for transparent and opaque complex words, in both English and in German. Additionally, we collected actual whole-word distributional vectors for the same complex words from large corpora of natural text. We then computed the similarities between the compositional vectors and the vectors for their base words, as well as the similarities between the whole-word vectors and the vectors for their base words. Here, the similarity between the compositional vectors and the base word vectors serves as a baseline condition indicating the degree to which similarity can be expected for the morphological systems in themselves. In both English and German, the compositional representations for opaque and transparent complex words show the same pattern with regards to the similarity to their base words. However, for the whole-word representations, another pattern emerges: relative to transparent words, German opaque words are more similar to their base words than English opaque words are. These computational simulations speak in favour of a higher systematicity in German morphology vis-a-vis English morphology, and offer a data-driven explanation to the dissociation observed in previous behavioural studies.

Acquiring the verbal morphology in Hebrew trough information in frequent frames

Tamar Johnson and Inbal Arnon
The Hebrew University in Jerusalem

Can frequent frames in Child Directed Speech (CDS) assist children in acquiring the complex structure of the verbal paradigm in Hebrew?

Hebrew, as a Semitic language, is featured with non-linear morphology. Verbs are created of radical elements inserted into one of seven binyan patterns. How do children acquire the verbal morphology in Hebrew? Under the usage-based assumption the suffice information should be present in children's input. We need to ask further, which aspects of the input assist them in acquiring this complex system? A corpus study has suggested that the input to children contains representative information about the verbal paradigm as for exemplars of different binyanim and roots[1]. But, children do not have access to the whole corpus at once. Rather, they get the input gradually and the learning process happens continually. Thus, we looked at **frequent frames in CDS** as providing the relevant information about the verbal paradigm. Frequent frames (repeated multiword patterns constructed of one to three morphemes or words) are a characteristic of CDS[2] and they were also found to facilitate processing[3]. In the current work, a corpus study was conducted; we looked at CDS in Hebrew to children aged 1 to 2:6. We identified 10 most frequent bigrams which predicts a verb to follow and found that (1) Frequent frames as a group provide representative information of the verbal paradigm: In number of different roots and their meaning, as well as exemplars of the different binyanim, resembling the entire corpus. (2) Each frame carries slightly different information (e.g. different frames are predictive to different roots) and (3) a computational model was developed imitating the way children can make use of frequent frames in the input to acquire the verbal morphology in Hebrew.

[1] Ashkenazi, O., Ravid, D., & Gillis, S. (2016). Breaking into the Hebrew verb system: A learning problem First Language 36 p. 505-524

[2] Cameron-Faulkner, T., Lieven, E., & Tomasello, M. (2003). A construction based analysis of child directed speech. *Cognitive Science*, *27*(6), 843-873.

[3]. Bannard, C., & Matthews, D. (2008). Stored word sequences in language learning the effect of familiarity on children's repetition of four-word combinations. *Psychological science*, *19*(3), 241-248.

Mental verbs in Palestinian Arabic narratives across school age

Fadi Kanaan and Dorit Ravid
Tel Aviv University

This study was designed primarily to examine the use of mental verbs in the narrative writing of Arabic speaking school-age children and adolescents. Mental verbs refer to internal, cognitive and emotional states and actions. It has been shown that it is hard for children to learn these verbs and therefore they are acquired relatively late despite occurring rather frequently in adult speech. Mental words are important for the development of perception because of the internal processes they represent (Hughes & Dunn, 1998; Shatz et al, 1983). The current study addressed narrative writing because today's public school students often are required to generate stories in the classroom, and they are evaluated on their ability to use precise vocabulary and grammatically appropriate sentences in this genre. Acquiring mental verbs may foster self-knowledge and meta-cognitive judgment and can prepare children for school: It is known that during the years between late childhood and late adolescence, significant growth occurs in the domains of cognitive, social, and linguistic development, and that substantial gains occur in the use of literate words and complex syntax in spoken and written communication (Nippold, 2007). Research has shown that as children and adolescents mature, they focus more attention on subtle aspects of human behavior such as the thoughts, emotions, motivations and inner reaction of the characters in their stories, which might prompt them to employ more mental verbs in the production of narrative texts. No study to date has examined mental verbs in Arabic, a language displaying diglossia – that is, two variants of the same language, one formal and written, one spoken (Ferguson, 1959).

To this end, two groups of typically developing students aged 9 and 17 years respectively (n=40 per group) were asked to write a personal-experience story about a situation where they (or a person they know) encountered shyness. Following Ravid & Egoz-Libstein (2012) on Hebrew, each student's narrative was examined for the occurrence of mental verbs, which were consequently analysed semantically (into cognitive, modal and emotive verbs) and morphologically, by *binyan.* Initial results will be presented and discussed.

References
Ferguson, C. (1959). Diglossia. *Word*, 15, 325–340
Hughes, C. & Dunn, J. (1998). Understanding mind and emotion: longitudinal associations with mental-state talk between young friends. *Developmental Psychology*, 34(5), 1026-1037.
Nippold, M.A. (2007). *Later language development: school-age children, adolescents, and young adults*. 3rd ed. Austin, Texas: Pro-Ed.
Ravid, D. & Egoz-Libstein, T. 2012. Mental verbs in the Hebrew lexicon. *Chelkat Lashon*, 45, 224-241.
Shatz, M., Wellman, H.M. & Silber, S. (1983). The acquisition of mental verbs: A systematic investigation of the first reference to mental state. *Cognition*, 14, 301-321.

Why we need to start thinking about language as a transaction record

Emmanuel Keuleers
University of Tilburg

I will combine recent evidence from psycholinguistics with a historical perspective on the evolution of linguistics within cognitive science to make the case that psycholinguistic investigation is suffering from a design problem that originates in how language and language users are defined. One result of this design problem is that investigative questions in psycholinguistics inevitably concern how linguistic notions such as grammar, lexicon, or morphology, are implemented in humans. Another result is that language is considered to be a target to be aquired and that language experience is broadly equal for all language users, resulting in the notion that corpora adequately represent language users' environment. I will argue that language sciences should adopt a new central design principle, namely that language is a transaction record, with different fields of investigation corresponding to different aspects of the transaction record. I will introduce evidence from psycholinguistic investigation into vocabulary knowledge to show that the vocabulary that people know cannot be accurately predicted by corpora, and that this is adequately explained by assuming a transaction record.

Instrument noun formation in Hebrew and its relation to the verbal system

Lior Laks
Bar Ilan University

This talk examines doublet formation of instrument nouns (INs) and their relations to the verbal system formation in Hebrew. Derived nominal in Hebrew are formed is several typical patterns (Berman 1978, Ravid & Avidor 1998, Ravid 1999, 2006 and references therein). In some cases the same derived nominal is formed in two patterns with no difference in the meaning as demonstrated below:

Morphological variation of INs
a. masnen mesanen 'filter'
b. maghec megahec 'iron'
c. **magresa(t)**-kerax **gores**-kerax 'ice-crusher'

In the examples above, both INs in each pair share the same stem consonants and are formed in different templates. *masnen* and *mesanen* (a), for example, share the consonants *s-n-n* and are formed in *maCCeC* and *meCaCeC* respectively. In some cases both forms are used and considered normative, while in others only one form is considered normative. Following Bolozky (1999, 2003), I argue that INs tend to change into templates that are identical to the participle form of the corresponding verb. While both *masnen* and *mesanen*, share the same nominal meaning, only *masnen* also has a verbal meaning of 'he filters'. This study accounts for the morphological changes that the Hebrew nominal system is undergoing and its relation to the verbal system.

The study is based on searches I conducted online and in various media. Examination of the data reveals that the change is always from the non-participle templates into a participle template and never the other way around. Nonetheless, not all INs change their template. I argue that this change can be predicted based on systematic criteria. The formation in the participle templates targets what I define as 'morpho-thematic transparency', namely morphological and thematic (semantic) transparency between the IN and the related verb. Thematically, the participle IN corresponds to the argument structure of the related verb and the thematic roles that it assigns (Grimshaw 1990, Rappaport-Hovav & Levin 1992, Alexiadou & Schafer 2008, among others). The IN has to be agentive in order to be thematically transparent and undergo a morphological change. The more transparent the thematic relation between the verb and the IN is, the greater the chance for morphological change. Moreover, INs that are heads of compounds are more likely to undergo variation (c). The presence of both the instrument itself and the patient in the same NP makes the IN thematically more transparent as it corresponds to the thematic roles of the verb. Morphologically, the formation of the participle form is more transparent as it requires fewer changes between the verb and the IN. The formation in the participle templates preserves the prosodic structure of the base verb.

The study adds to previous accounts of morphological changes that take place crosslinguistically in different domains. It enables to shed more light on the relations between the verbal and nominal systems and on the motivation for morphological changes both from morphological and semantic-thematic perspectives. The proposed analysis also provides support for a word-based approach of word formation. I will demonstrate that when forming INs based on existing verbs, other structural properties of the base are taken into consideration in addition to the consonantal root. This provides further support for the existence of a stem modification mechanism that operates directly on existing words without separate reference to the consonantal root.

What do children know about German verbal prefixes?

Veronika Mattes
University of Graz

The most frequent German verb prefixes *be-, ent-, er-, ver-* and *zer-* are all polysemous (for example *er-* has inchoative, resultative, and causative meaning) and the derived verbs very often have not only concrete but also abstract and/or lexicalized meanings (for example *entbrennen* "break out", *verdrehen* "twist", but also "prevaricate"). In early acquisition of German (up to age 3;0), these inseparable verbal prefixes are almost irrelevant. Early verbal derivations are usually formed with separable particles (e.g. *weg-laufen "run away"*), or, to a lesser degree, by conversion (*salz-en* "to salt", *spitz-en* "sharpen"), (cf. Behrens 1998, 2003, Rainer 2010).

Type and token frequencies of prefixed verbs increase considerably from age 3;0 up to school age (i.e. approx. 6;0), but the productivity of the patterns remains very low (cf. Rainer 2010: 80). This paper presents the results of an investigation of the usage and knowledge of verbal prefixes at the end of pre-school age (5 to 6) and early school age (7 to 8), comparing longitudinal and cross-sectional spontaneous speech to elicited definitions of prefixed verbs (conducted with 40 preschool and school children), focusing on the following research questions:
- Which prefixes are used?
- Which ones are productive?
- What functions are expressed by conventional and by newly coined prefixed verbs?
- What do children know about the functions of verbal prefixes?

The results show that by the end of pre-school age children produce the most frequent German verbal prefixes *ver-, be-, er-* and *zer-* according to their distribution in the input. However, the frequency of canonical prefixed verbs in spontaneous speech does not necessarily reflect children's knowledge about the functions of the prefixes used by them. Our study on morphological awareness, the pre-school children were almost exclusively able to give definitions for (rote-learned) canonical verb derivations, but not so for unknown prefixed verbs. In contrast, the majority of the 8-year old children was able to interpret meanings of non-canonical prefix verbs just as well. This result suggests that children have established independent representations of these prefixes at age 8.

However, the study also reveals that the lexical knowledge 8-year olds have about prefixes and prefixed verbs is still fragmentary. For example, they have not yet acquired the full range of meanings of polysemous prefixes, and they have not acquired abstract or lexicalized usages. The acquisition of verbal prefixes in German starts slowly in pre-school age, but the semantic and structural knowledge remains very constrained up to age 6. Between 6 and 8, a considerable increase with respect to the knowledge of verbal prefixes can be observed. The full mastery of the complex verbal derivation patterns presumably is a development that proceeds during adolescence.

References:
Behrens, Heike (1998): "How difficult are complex verbs? Evidence from German, Dutch and English", in: *Linguistics* 36 (4), 679-712.
Behrens, Heike (2003): "Verbal prefixation in German child and adult language", in*: Acta Linguistica Hungarica* 50, 41-59.
Rainer, Franz (2010): *Carmens Erwerb der deutschen Wortbildung*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

How much morphology does the verb need?

Stefan Rabanus
University of Verona

Indo-European languages show a tendency to reduce morphological exponence of inflectional features with respect to former stages of their history, giving rise to so-called syncretisms, e.g., English *we, you, they cut* with the same verb form for all plural persons. The syncretisms occur in both verb and non-verb paradigms, to different extents. In the first part of the paper the results of an in-depth study of 100 years of language change in German dialects are presented. It turns out that the degree of syncretism in German verb and non-verb paradigms is negatively correlated in order to guarantee the minimum of morphological exponence which is necessary in order to identify the components of the subject-predicate relation. In concrete terms: the more syncretisms in the verb paradigm, the less syncretisms in the pronoun paradigm, and vice versa. In the second part of the paper some explorations in other languages are conducted, with the aim to check whether this correlation - and, thus, a similar minimum of morphological exponence - is also attested in other languages.

The Hebrew verb *binyan* functions in an acquisition project

Dorit Ravid, Orit Ashkenazi, Ronit Levie, Devora Weissinger & Elitzur Dattner
Tel Aviv University

Typological studies indicate that verb morphology is key in the expression of verb semantics (Kibrik, 2012; Koptjevskaja-Tamm, 2012; Talmy, 2007). The current study investigates the role of Hebrew verb pattern morphology in children's learning to represent events in Hebrew. All Hebrew verbs consist of *binyan* patterns, vocalic templates into which root radicals are inserted as in *higdil* 'enlarge' vs. *gidel* 'raise' (root *g-d-l* 'grow'). Verb meanings combine lexically specific roots and *binyan Aktionsart /* transitivity values such as inchoativity, causativity, reflexivity, reciprocity, middle and passive voice (Berman & Nir-Sagiv, 2004; Comrie, 1976). For example, root *g-d-l* 'grow' combines with *binyan* patterns to derive basic *gadal* 'grow' (*Qal*), causative *higdil* 'enlarge' (*Hif'il*), passive *hugdal* 'be enlarged' (*Huf'al*), causative *gidel* 'raise' (*Pi'el*), passive *gudal* 'be raised' (*Pu'al*), and middle-reflexive *hitgadel* 'aggrandize oneself' (*Hitpa'el*). The seven-*binyan* system is organized in two sub-systems, each expressing the full range of *Aktionsart /* transitivity properties (Ravid et al., 2016). High-transitivity, highly agentive events (e.g., *feed, fix*) are mostly encoded in *Hif'il* and *Pi'el*, while low-transitivity, low-agentivity scenarios (*open, fall apart*) are encoded in *Nif'al* and *Hitpa'el* (Berman, 1993). This organization has important implications for acquisition and processing of the Hebrew verb lexicon, since learning verb semantics crucially involves gaining understanding of the *Aktionsart /* transitivity properties of *binyan* patterns in relation to the construal of scenarios with different transitivity values. The Hebrew *binyan* functions project aims to investigate how children acquire the two ends of the *binyan Aktionsart /* transitivity scale – the causative *Hif'il* and *Pi'el*, and the low-transitivity *Nif'al* and *Hitpa'el.* To this end, we analyzed a densely-recorded corpus of a boy dyad and a girl dyad between the ages 1;8-2;2, in natural parent-child interaction. This corpus consisted of Child Directed Speech (CDS) – containing 299,461 word tokens, 54,849 verb tokens, and 700 verb lemmas; and Child speech (CS) – containing 72,086 word tokens, 7711 verb tokens, and 256 verb lemmas. Each verb token in the relevant *binyan* patterns was analyzed in its syntactic context, with the general aim to reveal the characteristics of these verbs in early child speech and in the ambient language. The following two talks will delineate the specific aims and initial findings of this project.

References

Berman, R.A. 1993. Marking of verb transitivity by Hebrew-speaking children. *Journal of Child Language,* 20, 641-669.

Ashkenazi, O., D. Ravid & S. Gillis. 2016. Breaking into the Hebrew verb system: a learning problem. *First Language,* 36, 505 –524.

Berman, R.A. & Nir-Sagiv, B. 2004. Linguistic indicators of inter-genre differentiation in later language development. *Journal of Child Language,* 31, 339-380.

Comrie, B. 1976. *Aspect: An introduction to the study of verbal aspect and related problems.* Cambridge: Cambridge University Press.

Croft, W. 2012. *Verbs: Aspect and causal structure*. Oxford: Oxford University Press.

Dowty, D. 1991. Thematic proto-roles and argument selection. *Language*, 67, 547–619.

Kibrik, A. 2012. Toward a typology of verbal lexical systems: A case study in Northern Athabaskan. *Linguistics*, 50, 495–532.

Koptjevskaja-Tamm, M. 2012. New directions in lexical typology. *Linguistics*, 50, 373–394.

Ravid, D., O. Ashkenazi, R. Levie, G. Ben Zadok, T. Grunwald, R. Bratslavsky & S. Gillis. 2016. Foundations of the root category: analyses of linguistic input to Hebrew-speaking children. In R. Berman (ed.) *Acquisition and development of Hebrew: From infancy to adolescence* (pp. 95-134). Amsterdam: John Benjamins.

Talmy, L. 2007. Lexical typologies. In T. Shopen (Ed.) *Language typology and syntactic description. Vol III, Grammatical categories and the lexicon* (pp. 66-168). Cambridge: Cambridge University Press.

Vendler, Z. 1957. Verbs and times. *The Philosophical Review*, 66, 143-160.

Low transitivity in Hebrew verbs: Input-output relations in early childhood

Dorit Ravid, Gila Balazs & Mor Calmy
Tel Aviv University

The *Nif'al/ Hitpa'el* study inquired about the sources of knowledge available to Hebrew-speaking toddlers regarding low-transitivity events and how they are morphologically encoded in verbs. As child language is highly transitive (Berman, 1993), expressing less transitive, less agentive events seems to be more challenging for young children. All *Nif'al* verb tokens (1268 in CDS, 173 in child speech respectively) and *Hitpa'el* verb tokens (1496 in CDS, 114 in child speech) were extracted from the corpus. Each token was assigned a profile assembled from three analysis layers, as follows: (i) Vendlerian Temporality (Vendler, 1957) (classified by State, Activity, Accomplishment, Telicity); (ii) Voice (Active, Middle, Passive); and (iii) *binyan Aktionsart* (Inchoativity, Reflexivity, Reciprocity). Findings indicated that *Hitpa'el* and *Nif'al* profiles in the speech addressed to and produced by young children were more agentive than in older speaker/writers, e.g., *histakel* 'look'. The differences between *Hitpa'el* and *Nif'al* were pinpointed by their profiles: *Hitpa'el* verbs expressed mostly durative and accomplishment temporality, with mostly active voice, while *Nif'al* verbs mostly had accomplishment and telic temporality, with mostly middle voice. *Aktionsart* properties were more apparent in *Hitpa'el. Nif'al* tokens were affected by verb tense or mood, but *Hitpa'el* verbs were less linked to verb temporality. These findings may explain the direction of well-known Hebrew-speaking children's early *binyan* errors (e.g., expressing a telic event in *Nif'al* rather than *Hitpa'el*). At the same time, they point to the emergence of canonical low-transitivity *Nif'al* and *Hitpa'el* profiles in later language development. Finally, this study highlights the key role of morphology in canalizing the expression of events in specific *binyan* patterns in Hebrew.

References

Berman, R.A. 1993. Marking of verb transitivity by Hebrew-speaking children. *Journal of Child Language,* 20, 641-669.

Ashkenazi, O., D. Ravid & S. Gillis. 2016. Breaking into the Hebrew verb system: a learning problem. *First Language,* 36, 505 –524.

Berman, R.A. & Nir-Sagiv, B. 2004. Linguistic indicators of inter-genre differentiation in later language development. *Journal of Child Language,* 31, 339-380.

Comrie, B. 1976. *Aspect: An introduction to the study of verbal aspect and related problems.* Cambridge: Cambridge University Press.

Croft, W. 2012. *Verbs: Aspect and causal structure*. Oxford: Oxford University Press.

Dowty, D. 1991. Thematic proto-roles and argument selection. *Language*, 67, 547–619.

Kibrik, A. 2012. Toward a typology of verbal lexical systems: A case study in Northern Athabaskan. *Linguistics*, 50, 495–532.

Koptjevskaja-Tamm, M. 2012. New directions in lexical typology. *Linguistics*, 50, 373–394.

Ravid, D., O. Ashkenazi, R. Levie, G. Ben Zadok, T. Grunwald, R. Bratslavsky & S. Gillis. 2016. Foundations of the root category: analyses of linguistic input to Hebrew-speaking children. In R. Berman (ed.) *Acquisition and development of Hebrew: From infancy to adolescence* (pp. 95-134). Amsterdam: John Benjamins.

Talmy, L. 2007. Lexical typologies. In T. Shopen (Ed.) *Language typology and syntactic description. Vol III, Grammatical categories and the lexicon* (pp. 66-168). Cambridge: Cambridge University Press.

Vendler, Z. 1957. Verbs and times. *The Philosophical Review*, 66, 143-160.

Semantic profiles of *binyan* patterns in Hebrew verbs: A developmental corpus study

Efrat Salzberg-Raz, Elitzur Dattner & Dorit Ravid
Tel Aviv University

The *binyan* system, which organizes all Hebrew verbs in morphological patterns, is associated with degrees of transitivity and Aktionsart values, and thus highly relevant to syntax as well (Berman, 1978). Traditionally, specific syntactico-semantic functions have been attributed to each *binyan*, e.g., *hif'il* and *pi'el* expressing causativity (*higdil* 'enlarge' and *he'elim* 'made to disappear', *gidel* 'raise'), *hitpa'el* and *nif'al* expressing middle voice, reflexivity and reciprocity (*hitgadel* 'aggrandize oneself', *ne'elam* 'disappear') (Schwarzwald, 2002). This approach, however, ignores the specific lexical content of each verb and the effects of syntactic and pragmatic context. While the distribution of structural *binyan* patterns and its implications on discourse stance have been investigated (Berman & Nir-Sagiv, 2004), no attempt to date has been made to examine the semantic functions of actual verbs in usage in relation to *binyan* structure -- beyond early acquisition (Berman, 1993; Ravid et al., in press). The current study set out to characterize the semantic functions of the Hebrew *binyan* system as a continuum based on the Transitivity Hypothesis (Hopper & Thompson, 1980) in a corpus of 11,574 word tokens, composed of 80 Hebrew narratives and expositions written by participants in four age groups (9-10, 12-13, 16-17 year olds, and adults) (Berman & Verhoeven, 2002).

The 1833 verb tokens (469 verb lemmas) in the corpus were each analyzed by root and *binyan* pattern and all inflections within its syntactic clause (altogether 2263 clauses), that is, including all occurrences of the same verb lemma and all verbs occurring in complex verb constructions. Each verb token was assessed by seven semantic criteria, each consisting of several (2-4) degrees: *kinesis* (state to motion), *aspect* (telicity to duration), *agency* (grammatical subject as agent, patient or experiencer), *positivity* (positive or negative content), *mode* (realis or irrealis), *affectedness* (of grammatical object) *and concreteness* (concrete to abstract content). We hypothesized that verbs in different *binyan* conjugations would be characterized by typical profiles made up of these criteria, as modulated by age group and text genre (Berman, 2005).

These expectations were confirmed. A Latent Cluster Analysis identified three profiles of verbs in the corpus, each with a different composition of the seven semantic criteria, which were associated with low (44%), medium (27%) and high degrees of transitivity (29%) profiles. These profiles were significantly related to the three study variables. First, they were associated with age, with increasingly lower transitivity verbs in older age groups - that is, verbs in the texts of older writers had low kinesis, were moderately durative, less agentive and object-affected, more abstract and irrealis than those in younger writers. Second, they were associated with genre, with more high transitivity (more kinetic, durative, positive, realis, concrete) verbs in narratives, characterized by events, and more lower transitivity verbs in expositions, concerned with ideas and states. Most importantly, the profiles were found to characterize specific *binyanim* – higher transitivity verbs associated with *qal, hif'il* and *pi'el* verbs, lower transitivity verbs with *nif'al, hitpa'el, pu'al* and *huf'al* verbs, as predicted in the developmental literature (Berman, 1993). This study indicates that the *binyan* system can be regarded as constructions in the sense of Goldberg (2003), that is, as a system of structures (morphological patterns) consistently associated with a set of meanings and functions (profiles consisting of different distributions of the seven criteria), emerging from their particular verb instantiations in usage.

References

Berman, R.A. (1978). *Modern Hebrew Structure*. Tel Aviv: University Publishing Projects,

Berman, R.A. (1993). Marking of verb transitivity by Hebrew-speaking children. *Journal of Child Language*, 20, 641-669.

Berman, R.A. (Ed.) (2005). Special Issue on *Developing Discourse Stance across Adolescence.* R. *Journal of Pragmatics,* 37, 2.

Berman, R. A. & Nir-Sagiv. (2004). Linguistic indicators of inter-genre differentiation in later language development. *Journal of Child Language*, 31, 339-380.

Berman, R.A. & L. Verhoeven (Eds.). (2002) Special Issue on *Cross-linguistic Perspectives on the Development of Text Production Abilities in Speech and Writing*. *Written Language and Literacy, 5,* Parts 1 and 2.

Goldberg, A.E. (2003). Constructions: a new theoretical approach to language. Trends in Cognitive Sciences, 7, 219-224.

Hopper, P.J. & S.A. Thompson (1980). Transitivity in grammar and discourse. Language, 56, 251–299.

Ravid, D., O. Ashkenazi, R.Levie, G. Ben Zadok, T. Grunwald, R. Bratslavsky & S. Gillis. Foundations of the root category: analyses of linguistic input to Hebrew-speaking children. In R. Berman (ed.) *Acquisition and Development of Hebrew: From Infancy to Adolescence.* TILAR (Trends in Language Acquisition Research) series. Amsterdam: John Benjamins.

Schwarzwald, O.R. 2002. *Hebrew morphology*. Tel Aviv: The Open University of Israel [in Hebrew]

The development of the implicit causality bias in transitive verb processing

Sascha Schroeder
Max Planck Institute for Human Development, Berlin

It has been shown that some transitive verbs are biased in the direction of the subject or the object of a sentence. For example, participants are more likely to complete a sentence such as *John feared Mike because he…* in a way that the pronoun *he* refers to the object (*…because he was a bully*) than to the subject of the sentence *(…because he was generally fearful)*. This tendency is called *implicit causality (IC) bias* (Garvey & Caramazza, 1974)*.* Although it is already present in preschoolers (Pyykkönen et al., 2010), it is unclear how this bias develops and which cognitive skills it involves. In particular, it is not yet decided whether low-level word-knowledge or high-level integration skills are more important.

In the present study, I investigated linguistic and cognitive determinants of the IC bias in developing readers. 370 school children (*M* age: 14 years) worked on a computerized pronoun resolution task. Children read sentences such as *John liked Mike because he was a funny person* and had to decide as quickly as possible whether the pronoun referred to the subject or the object of the sentence. In addition, their word knowledge and integration skills were assessed.

Stimulus materials were 16 action verbs involving an "actor" and a "patient" (e.g., *hit*) and 16 "psycho" verbs involving a "stimulus" and an "experiencer" (e.g., *love*). Both types of verbs were either biased to the subject (V1: actor-patient vs. stimulus-experiencer verbs) or to the object (V2: actor-evocator vs. experiencer-stimulus verbs). In addition, all verbs were presented with continuations that were either consistent or inconsistent with the bias of the verb.

Analyses of children's response accuracies and response latencies using linear mixed-effects models showed that their performance on actions verbs was generally good. By contrast, they exhibited problems on psycho-verbs, particularly for stimulus-experiencer verbs (e.g., *frighten*) which violate canonical case mapping rules. Complimentary, experiencer-stimulus verbs (e.g., *fear*) showed the largest IC bias (measured as the difference between the congruent and incongruent condition). This indicates that it is particularly effortful for children to refer to the stimulus role during pronoun resolution. Instead, the experiencer is generally preferred. Further analyses using children's cognitive abilities as covariates revealed that their ability to overcome this tendency was not related to low-level word-knowledge. Instead, high-level integration skills were particularly important. This indicates that it is particularly challenging for children to reconstruct a coherent event structure that involve other person's mental states.

In sum, this study shows that children's pronoun resolution during reading depends on both linguistic (verb type) as well as cognitive factors (integration skills) that interact during language development. Results are discussed with regard to recent models of pronoun resolution and cognitive development.

The history of canonical verb positioning in German declarative clauses

Augustin Speyer
University of the Saarland

In German declarative clauses, the finite part of the verb usually stands after the first constituent of the clause. The position of the first constituent is often referred to as *prefield*. It is not structurally determined, however, which constituent is placed in the prefield. Instead, information structural requirements determine, which constituent is put into the prefield. Properties that constituents should have to be selected for the prefield are (cf. Speyer 2008 with references):

a. the constituent delimits the situation in which the proposition is evaluated with respect to truth value (SCENE-SETTERS, 1a)

b. the referent of the constituents stands in a set relationship with some other referent in the immediate context (*contrastive elements*, 1b)

c. the referent of the constituent functions as the aboutness topic of the clause (**topics**, 1c)

(1) a. SCHON IM VORJAHR […] waren **die vielen** [...]**Briefe** geschrieben […] worden.
    'ALREADY A YEAR BEFORE **the many letters of invitation** have been written.'

   b. *Dem SPD-Kanzlerkandidaten Gerhard Schröder* hielt **Waigel** vor, [...].
    Alt-Bundespräsident Richard von Weizsäcker warf   **Waigel** eine
    „[...] Verharmlosung" der   SED-Nachfolgepartei vor.
    '**Waigel** confronted *the chancellor candidate of the SPD (labour) G. Schröder*... **Waigel** accused *former federal president R.v.Weizsäcker* to trivialize the successor party of the SED.'

   c. **Verteidigungsminister Peter Struck (SPD)** hat gestern   sein Sparprogramm
    bekannt gegeben. **Er** sieht darin   auch einen Schritt zur   Reform der
    Bundeswehr
    '**Secretary of Defense P. Struck** announced his plans for budget cuts yesterday. **He** sees this also as a contribution to a reform of the federal army.'

If more than one phrase eligible for the prefield are present in the clause, a hierarchy scene setter > contrastive element > topic is observed, as is apparent in (1a,b) (Speyer 2008).

The Modern German situation looks like a blend of several fronting strategies which are used in other Germanic and other Indo-European languages: Fronting of contrastive elements is possible in Modern English (topicalization, see Prince 1999), fronting of topics, or rather: a serialisation in which the more informative an element is, the more to the back it is positioned, is a hallmark of several Germanic and Slavic languages (Daneš 1970) and can be also observed in ancient Indo-European languages such as Latin (Panhuis 1982).

Interestingly, the modern German system developed out of a system in which 1) the prefield was a designated topic position, 2) the topic could be dropped which led to a mixture of verb-first and verb-second declarative clauses. Starting the clause with a verb thus induced expectations on the side of the addressee with respect to the thematic structure of the clause. This property was later obliterated by the development of generalized verb-second.

References:
Daneš, Frantisek (1970): Zur linguistischen Analyse der Textstruktur. *Folia Linguistica* 4, 72-78.
Panhuis, Dirk (1982): *The communicative perspective in the sentence. A Study of Latin Word Order*. Amsterdam/Philadelphia: Benjamins.
Prince, Ellen (1999): How Not to Mark Topics: 'Topicalization' in English and Yiddish. *Texas Linguistics Forum*, Austin.
Speyer, Augustin (2008): German Vorfeld-filling as Constraint Interaction. In: Benz, Anton und Peter Kühnlein (Hgg.) *Constraints in Discourse*. Amsterdam/Philadelphia: Benjamins, 267-290.

Conceptual Perspectives on German Particle Verbs

Sylvia Springorum
University of Stuttgart

What is a Verb? We aim to address this question with a discussion of possible meaning formation processes of German particle verbs like *anstrahlen* (beam at), which are compositions of a prepositional particle (P) and a base verb (BV). A plain P without context is first understood as a concept, a cognitive object, mainly derived from the visual perception of space. This assumption is supported by (Springorum and Schulte im Walde, to appear), who experimentally show that Ps can be assigned to arrow pictographs, suggesting a conceptual directionality underlying P. Also, the language acquisition studies of (Penner at el., 2003) have demonstrated that Ps are not only among the units learned first, but are also used in a verb-like manner, in the absence of verbal context, which aligns with our Hypothesis: Through composition with a verbal context, we argue that the P concept gets resolved into a clearly specified lexical meaning. The resulting meaning is thereby determined by the contextual constraints. These can have various forms depending on the domain, the event structure of the verb or the degrees of concreteness - or, respectively, abstractness - of the expressions in the context. For example, the P *auf* is associated with the concept UP, which can be perceived in the space domain as a counter-gravity direction. Together with the BV *steigen* (climb) it forms the PV *aufsteigen* (climb up); a form which is at this point, however, still ambiguous. One would thus understand its meaning within the space domain when it is marked with a concrete verbal argument like Treppe (staircase), as literal. Whereas, with an abstract argument like *Karriereleiter* (career ladder), the meaning of the PV shifts from a concrete upward movement to a rise towards a better social position. In the first case, the UP concept has to be resolved in the euclidean height dimension from space. In the second case, UP demands analysis in terms of the social hierarchy domain.

Our goal is to systematically describe the meaning evolution of a PV from an unspecified concept to a verb with several possible meanings to a specified verbal phrase. As will be shown with these and other examples, the characteristics of the domain and its dimensions play a central role. In light of this realisation, we will apply Gärdenfors' framework of Conceptual Spaces (Gärdenfors, 2004), whose detailed descriptions of domains and their dimensions prove a very useful tool for situating the various steps in the PV meaning forming process.

References:
Gärdenfors, P. (2004), *Conceptual spaces: The geometry of thought* , The MIT Press .
Penner, Z., Schulz, P. & Wymann, K. (2003). *Learning the meaning of verbs: What distinguishes language impaired from normally developing children?* Linguistics, 41(2), 289-319.
Springorum, S. and Schulte im Walde, S. (to appear) *Aiming with arrows at particles. Towards a conceptual analysis of German particle verbs.*

Complex verbs: a comparative and typological perspective

Stefan Thim
University of Vienna

Preliminary observations on the compositionality of Russian verb forms in L1 acquisition: a case study

Maria D. Voeikova and Kira A. Ivanova
Institute for Linguistic Studies, RAS, Saint Petersburg

We are concentrated on the earliest period of language development (from the onset of speech production to three years) trying to understand when do children realize the meaning of separate morphemes and how do they process the morphologically complex units. For this purpose, we analyzed the speech production of a Russian boy aged from 1;5 to 2;8 tape-recorded with his mother during daily activities at home with the interval of 2-3 weeks. The cumulative number of verbs in his speech production reached 368 lemmas, 794 types, 2201 tokens.

These verbs may be divided into three major categories according to their compositionality: 1) short morphologically unrelated primary verbs without semantically identifiable morphemes except the stem and grammatical verb markers, e.g. *brosi-t'* 'to throw&PFV-INF', *bra-t'* 'take&IPFV-INF'; 2) morphologically derived verbs with transparent and identifiable parts like *katat'-sja* 'to roll-self' from the causative *katat'* 'to make rolling', numerous prefixed verbs like *u-jti* 'away-go' from *idti* 'go' or secondary imperfectives like *otkr-yva-t'* 'open-IPFV:INF' from *otkry-t'* 'open-INF'; 3) morphologically derived opaque verbs containing both identifiable and non-identifiable parts, like *po-mest-it'* 'to place' containing the semantically opaque prefix *po-* and the root *mest-* 'place'. The number of verb derivatives is high because of aspectual pairing and other regular derivational patterns. Thus, the action of jumping may be presented by at least eight different verbs: *prygat'* 'jump', *pryg-nut'* 'jump once', *pod-prygnut* 'jump up once', *za-prygnut'* 'jump upon some object once', *s-prygnut'* 'jump from some object once' and every prefixed form can be a base for the secondary imperfectives denoting doing this several times.

Our object starts with all three types of verbs from the very beginning using one opaque (*sadit'sja* 'sit down') and one transparent (*upast'* 'fall down') morphological derivative already at the age of 1;5. From the very beginning, he uses those forms without understanding the meaning of their parts. However, starting from 1;8 he demonstrates a diversity of derivatives opposed with their simplexes. We predict that the share of compositionally different verb lemmas is accidental in children's speech, whereas the percentage of verb types and tokens of primary verbs should be higher compared to the their derived morphologically transparent counterparts. The morphologically derived opaque verbs are the smallest group in types (different opposed forms) and in tokens (different forms including repetitions). Our calculations confirm this prediction. This shows that children are sensitive both to the compositionality and to the transparency of verb derivatives.