

A4 Development of functional concepts in French

1 General Information

1.1 Applicant

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1.2 Topic

Development of functional concepts in French

1.3 Scientific discipline and field of work

General and Romance linguistics, frame semantics, cognitive semantics, semantic change, history of French

1.4 Scheduled total duration

Six years

1.5 Application period

Three years

1.6 Summary

French is characterized by a large number of nouns denoting functional concepts such as *adresse, beauté, contenu, destin, longueur*. An etymological survey shows that the majority of these nouns are derived and nearly always transparent: they can either be traced back to descriptive adjectives (*long* → *longueur*) or to verbs (*contenir* → *contenu*). Most interesting is the development of deverbal nouns, because these undergo extensive semantic changes in their transformation from event verbs to functional nouns by drawing on associative cognitive processes like metonymy and metaphor. What is even more surprising is that most of them stem from roots denoting sensory-motor concepts deeply embedded in the fabric of human perception and action (OFr. *tailler* → *taille*). Due to its nearly 1200 years of documented history as well as its many loan words from Classical Greek and Latin, French provides the perfect subject matter for case studies in concept formation.

2 State of the art, preliminary work

2.1 State of the art

1. Typology of Concepts: We assume that functional concepts (FCs) constitute a separate concept type. They differ in semantic and grammatical characteristics from sortal concepts, which are prototypical for the grammatical category of noun (for details see project A1). They

also share many characteristics with dimensional adjectives and dimensional verbs (see project A2).

2. Concept history: FCs seem to reflect a comparatively young accomplishment in language history that can be linked to a transition to abstract, inferential reasoning. The earlier stages of Indo-European languages show a very restricted inventory of FCs. From a modern perspective even Homeric Greek appears to be a “concrete” language, which lacks concepts for *body* and *soul*. A transition in FC-formation represented the introduction of Greek philosophy at the beginning of the 6th century B.C. This period saw the “transition from myth to logos”, when new modes of thinking emerged and seemingly incongruous and inappropriate myths were replaced by rational explanations of the world (Snell 1975, 1978, Schadewaldt 1978). This period evidences an amazing production of perfectly coined FCs, which could be transferred to later vernaculars. The history of Western thought provides ample evidence for this effortless transmission of FCs from Ancient Greek via Latin to modern European standard languages like French (Fr. *sujet, énergie, masse, principe*; see collaborative research on philosophical terms with project B3). Furthermore, with its affinity to concept development Old French added numerous interesting facets during the Middle Ages (like *atrait, destin, taille*), which reveal astonishing parallels to similar concept formations occurring more than a thousand years ago.

3. Historical Lexicography: The history of French FCs and their Greek and Latin predecessors has not been systematically documented. Often functional readings of nouns are not recorded in historical dictionaries of French, because lexicographers concentrated on authentic, inherited words and tended to neglect functional readings of technical and scientific domains. The formation and evolution of French vocabulary have been accounted for in studies that are not suitable for our research into concept change (Brunot 1905ss., Stefenelli 1981, etc.). Thus, the history of French FCs has yet to be reconstructed in detail with the aid of digitalized corpora (like *Frantext*).

4. Diachronic semantics: Semantic changes from Latin to French have been debated from an onomasiological or semasiological point of view (see Schmidt-Wiegand 1992, Schmitt 2001 for discussion). Only rarely do these studies treat semantic change relevant to FC-formation in a systematic way. In recent years there has been a renewed interest in meaning change from a cognitive semantics perspective, which places emphasis on recurrent patterns of semantic change relevant for FC-formation (see especially Sweetser 1990, Traugott & Dasher 2001, Geeraerts 1997, Blank 1997, Koch & Blank 1999, Koch 2004, 2005).

5. Nominalization: Nominalization and more specifically deverbal nominalization have been a matter of controversial debate since the 1960s (see Lees 1960 through Chomsky 1970 to Grimshaw 1990 and Roeper 2005). Work in this area has focused on changes to verbal argument structures via nominalization (see lexicalist vs. non-lexicalist hypothesis). Only recently, the center of interest has shifted to the semantics of deverbal nominalizations. As a hybrid word class, deverbal nouns show complex variations between event, process, result, state and object readings dependent on semantic verb classes (see Ehrich & Rapp 2000). Even though sortal readings of deverbal nouns are becoming more clearly defined, a thorough discussion of functional readings for suffixes is still lacking. Close descriptions of French suffixes like *-age, -ment, -tion*, etc. show different semantic ranges according to verb class and semantic trans-

formations, all of which are context dependent (see Kelling 2004, Meinschaefer 2005, Alexiadou & Rathert 2007, Becker 2006, resuming prior work in Romance linguistics like Alsdorf-Bollée 1970, Lüdtké 1978, Corbin 1991, Fleischman 1980).

6. Embodied cognition: The etymological transparency of deverbal nouns denoting FCs reveals that they are deeply rooted in sensory-motor experience. In general, there are striking parallels to concept formation as put forth in the *embodied cognition theory* (see Ziemke 2003 for discussion). The idea that concepts are embodied assumes that we entertain a species-specific view of the world due to the nature of our physical bodies (Varela, Thompson & Rosch 1991, Evans 2005). According to this theory concepts are not represented by propositional, abstract and amodal symbols, but are grounded in sensory-motor experience. Recent research stemming from widely different disciplines like cognitive linguistics, developmental psychology and brain research strongly confirms an experiential approach, in which sensory perception and motor actions support comprehension (Lakoff & Johnson 1980, 1999, Johnson 1987, Lakoff 1987, Harnad 1990, Tomasello 1999, Barsalou 1999, Cangelosi & Parisi 2002, Arbib 2005, Gibbs 2005, Yeh & Barsalou 2006).

7. Mental imagery: There is much discussion on how neural structures are transduced to concepts by mental imagery. Schematic representations seem to play an important role in this process. Lakoff & Johnson postulated a set of image schemas that are defined as highly schematic gestalts capturing the structural contours of sensory-motor experience and integrating information from multiple modalities. When profiling perceptual experience they create a fundamental bridge to abstract reasoning and considerable evidence has been gathered with regard to their role in inference (Lakoff & Johnson 1987, 1999, Lakoff & Nuñez 2000, Mandler 2004, see Hampe 2005 for discussion). Barsalou proposed schematic perception-based symbol formation via selective attention, which results in pre-conceptual, multimodal organization of experience. This parallels neurological research postulating a neural instantiation of concepts as a “graded set of activations of the schema network”, where the network relates both perceptual and motor schemata (see Arbib 2005). It is important to note that schematic representations seem to operate at a level distinct from neural or “pictorial” representations (Johnson 1987, Barsalou 1999, Mandler 2004 for discussion). Recent work suggests that many aspects of visual and motor imagery share a common representational, and possibly, neuropsychological substrate.

2.2 Preliminary work

For many years now the project head's research has focused on typological changes from Latin to French. Besides other areas Geisler (1980) treats the formal and functional development of preverbs and prepositions from Old Latin to Modern French with a typological perspective. Some papers deal with the evolution of action verbs. Geisler (1982) outlines a prototypical action frame, which can be used in tracing metonymically activated change of verb transitivity from Old to Modern French. Geisler (1991) also describes the evolution from an Old Latin *mihi-est-X*-construction type to a Modern French *habeo-X*-construction type, with emphasis on auxiliary verb formation out of action prototypes like GRASP, HOLD, TAKE, and GIVE. The paper tries to relate these different types of event framing with culturally induced concept change. Geisler (1994) shows that abstract concept formation and grammaticalization

are initiated from the same anthropomorphic base.

Own publications

- Geisler, H. (1982). Studien zur typologischen Entwicklung. Latein – Altfranzösisch – Neufanzösisch. München: Fink.
- (1988). Das Verhältnis von semantischer und syntaktischer Transitivität im Französischen. *Romanistisches Jahrbuch*, 39, 22-35.
- (1991). Sein und Haben als sprachliche Organisationsprinzipien. *Romanistisches Jahrbuch*, 42, 17-33.
- (1994). Grammatikalisierungsprozesse im Italienischen. *Italienische Studien*, 15, 3-26.
- (1998). Wortstellung und Informationswert im altfranzösischen Relativsatz mit *qui*. In: E. Werner et al. (Eds.), *Et multum et multa. Festschrift für Peter Wunderli zum 60. Geburtstag* (pp. 279-292). Tübingen.
- & Jacob, D. (Eds.) (1998). Transitivität und Diathese in romanischen Sprachen. Tübingen.

3 Goals and work schedule

3.1 Goals

Goal 1. Tracing FC-development for selected French deverbal nouns

Modern European languages like French show a growing number of nouns denoting functional concepts (FCs), which assign an aspect or dimension with a value to a possessor argument (see project A1). Syntactically FCs show up as definite abstract nouns in a constructional head-noun position with their referent in dependent possessor argument position – typically realized in French as possessive *de*-construction – and the value realized as a predicate, an “object of measurement” or something similar.

- (1) *La température de l'eau monte à trente degrés Celsius.*
 [with: température = FC, eau = POSSESSOR, monte à = OPERAND, trente = VALUE, degré = DIMENSION UNIT, Celsius → DIMENSION MEASURE]

The number of nouns denoting FCs varies considerably between different languages and cultures, obviously reflecting different types of reasoning and conceptualization in speech communities. To a great extent FCs in French are etymologically transparent, which indicates their comparative recency and their correlation to specific cognitive abilities. FCs seem to increase considerably when a change occurs from sensory-motor concepts to concepts used in abstract reasoning. The French language clearly manifests these different types of conceptualization in its long and well-documented history. Our work will delineate the semantic and formal development for selected concepts.¹ The following example presents a normal Old French posture verb denoting an event which appears as a resultative past participle (a mixed category with verbal and nominal features) and finally emerges as a noun that can subsequently denote different FCs in Middle French and Middle English:

- (2) OFr. *asseoir* ‘to cause to sit’

¹ For every single concept there is a bulk of synchronic and diachronic information dispersed in dictionaries and texts which needs a coherent structuring to encompass the complex filiations and shadings which showed up as French nouns with FC-readings. In order to enable this task we developed a prototype of a software tool named *FBegriffe* which helped us consistently organize data related to each noun (see appendix 1).

- OFr. *assise* [PP fem. of *asseoir* ‘cause to sit’]
- OFr. *assise* [verbal noun] ‘session, assessment, regulation, manner’
- MFr. *assise* ‘extent’, ‘amount’, ‘magnitude’ [from the notion of regulating something by fixing the amount of it (cf. weights, food portions, etc.)]
- MEn. *size* ‘magnitude’, ‘circumference’, ‘length’ [loanword from Anglo-Norman with misdivision of *l’asise* as *la sise*]

Later Old French marked a gradual upsurge in concept development without having any recourse to classical forerunners. This widely unattended layer of French vocabulary added many interesting new facets to FC-formation during the Middle Ages, which show astonishing parallels to the Greek and Latin concept formation that existed more than a thousand years before (like OFr. *adresse*, *affaire*, *aquest*, *assise*, *attrait*, *destin*, *guise*, *issue*, *marque*, *portrait*, *preuve*, *taille* etc.). However, FC-formation from own sources slowed down considerably, when French replaced Latin in all domains of verbal knowledge representation in its progress from regional variety to standard language. From this time on, the vernacular suddenly needed FCs in a wide range of specialized domains like religion, philosophy, art and techniques. Fortunately, FCs for all these domains had already been implemented more than a thousand years ago in Greek and then handed down to Latin. After a soft start in the 13th century these perfectly coined FCs entered French in great numbers during the Renaissance, and in the 17th century they configured a new layer of learned vocabulary that turned Modern French into a Greco-Latinized language (see loanwords like *théorie* [1496], *énergie* [ca. 1500], *structure* [1528], *évolution* [1536], *phase* [1544], *phénomène* [1554], *mixture* [1560], *contact* [1586], *section* [1671], *thérapie* [1669], *réaction* [1690], etc.). The prefabricated Greek and Latin FCs stood for abstract inferential reasoning and could easily be adapted to represent the rapidly expanding scientific and technological knowledge of the period. The following example demonstrates adaptation of a Greek and Latin based FC to the domain of physics.

- (3) Gr. *krasis* ‘proper mixture (of humours)’ [verbal noun derived from Gr. *kerán-nymi* ‘I mix properly’]
 –50 a.c. → Lt. (loan translation) *temperatura* and *temperamentum* ‘proper mixture’
 [verbal nouns derived from Lt. *tempero* ‘I use the right measure, mix properly’]
 –1478 → Fr. *tempérament* ‘juste proportion’
 –1538 → Fr. *température* ‘tempérament’ (!)
 –1562 → Fr. *température* ‘degré de chaleur de l’atmosphère en un lieu’
 –19° s. → Fr. *température* ‘manifestation de l’énergie cinétique moyenne de translation des molécules d’une substance, due à l’agitation calorifique’
 [phys.]

Some concepts display a tangled evolution, because loans from esteemed high-variety languages tend to replace indigenous FCs in Old French or they exist side by side with native nouns (called *doublets*) often confining them to special domains, such as law, religion, medicine, etc.).

- (4) Lt. *quaerere* ‘search, look for’
 → Lt. *acquīrere*, *acquīsītum* ‘obtain, gain’
 → VLt. **adquaerere*, **adquāesitum* → OFr. *aquerre*, *aquest*

- 12^o → OFr. *aquest* (n.m.) ‘increase of possession, acquisition’ [deverbal noun]
- 1283 → OFr. *aqusicion* ‘increase of possession, acquisition’ [semi-learned loan from Lt. *acquisitio* ‘increase of possession, acquisition’, deverbal noun derived from Lt. *acquīrere, acquīsītum*]
- 1595 → Fr. *acquis* ‘gain in experience’, ‘experience of life’ [from late OFr. *acquis* [PP] to *acquérir* which replaced OFr. *aquerre* in the 14th c.]
- 17e → Fr. *acquisition* ‘increase of possession, acquisition’, ‘personality, character’ [learned loan from Lt. *acquisitio* ‘increase of possession, acquisition’, deverbal noun derived from Lt. *acquīrere, acquīsītum*]
- 18e → Fr. *aquêt* ‘property acquired after marriage [**law**]’ [from OFr. *aquest*]

As of the 13th century we can observe an intriguing mixture of self-made FCs coined during the OFr. period and ready-made functional concepts adopted from Classical Greek and Latin.

Goal 2. Defining the sensory-motor foundation of FCs in French

A thorough investigation into the history of FCs demonstrates a surprising result; nearly all of the nouns denoting them can be traced back to an exclusive group of verbs denoting sensory-motor concepts which are grounded on human perception and action. An important group of FCs seems to be based on neural motor programs classified by hand movements and conceptualized in REACHING OUT FOR, GRASPING, HOLDING and subsequently MANIPULATING an OBJECT:

- (5) Lt. *capere* ‘to grasp, to take’
 - Lt. *concupere* ‘to take together (with/in a recipient)’ → ‘to take (in one’s head)’
 - Lt. *conceptus* [PP resultative] ‘*taken together’
 - Lt. *conceptus* [verbal noun] ‘*the (thing) taken together (in one’s head)’
 - ‘idea, thought, concept’
- 1404 → Fr. *concept* ‘concept’
- (6) Lt. *tenere* ‘to hold’ → OFr. *tenir* → *contenir* ‘to hold together’ –16e → Fr. *contenu* ‘content’
- (7) Lt. *volvere* ‘to turn’ → *evolvere* ‘to turn out’ → *evolutio* ‘turning out’ –1516 → Fr. *évolution* ‘evolution’

Another important group of FCs refers to the three human postures STANDING, SITTING and LYING with a marked preference for the cardinal posture STANDING:

- (8) IE. **stā-* ‘stehen’ → Gr. *epistasthai* ‘to stand on’ → *epistēmē* ‘knowledge, cognition’; Lt. *distare* ‘to stand apart’ → *distantia* –1265 → Fr. *distance* ‘distance’; Lt. **stānare* → *dēstinare* ‘to put firmly on the ground, to arrange, to fix’ → Lt. *destinatio* ‘destination, fate’, etc.
- (9) Lt. *sedere* ‘to sit’ → **potis sedere* ‘to sit mightily’ → *possedere* ‘possess’ → *possessio* → Fr. *possession* ‘possession’
- (10) Gr. *keisthai* ‘to lie’ → *hypokeisthai* ‘to lie under’ → *hypokeímenon* ‘lying under’ → *to hypokeímenon* ‘s.th. lying under, forming the basis of (an attribute)’ → Lt. (loan translation) *substantia* –1532 → Fr. *substance* ‘substance, matter’

Further groupings can be classified as subtypes modifying the two main groups: 1) body postures can be used as reference points for caused body positions CAUSE TO STAND/SIT/LIE and different kinds of body motion (cf. FALLING, LEANING, GOING, etc.); 2) manipulation can be differentiated between a wide range of contiguous hand actions and tool manoeuvring techniques (like BEATING, THROWING, PULLING, SCRATCHING, CUTTING, etc.) or subsequent culturally specific action modes (cf. POSSESSING, GIVING, TAKING, etc.). The last group shows variations between different languages and cultures.

- (11) Gr. *histánai* ‘to cause to stand’ → *synistánai* ‘to cause to stand together’ → *sýstēma* ‘*standing together’ → ‘assemblage’ (→ Lt. loan translation *compositio*) –1552→ Fr. *système* ‘ensemble conçu par l’esprit’ → ‘system’
- (12) Gr. *tithénai* ‘to cause to sit’ → *hypotithénai* ‘to cause to sit under’ → *hypóthesis* ‘*setting under’ → ‘assumption’ (→ Lt. loan translation *suppositio*) –1531→ Fr. *hypothèse* [math.] ‘base de la démonstration d’un théorème’
- (13) Gr. *lyein* ‘to loosen’ → *analýein* ‘to unloose, to break up’ → *ánálýsis* [nomen actionis] ‘undoing, decomposition, resolution’ –16e s.→ Fr. *analyse* ‘analysis’

Goal 3. Identifying associative processes in FC-formation

The history of language indicates that FCs start from perceptual bases and are adjusted to attributes of an object by profiling some aspect of the perceptual base by means of associative cognitive processes like metaphor and metonymy. These processes rely on gestalt principles of perception (figure and ground, similarity, proximity or contiguity, etc.) and can be specified for every step in concept formation. With their inception metonymic profiling strategies in event frames appear to dominate, whereas metaphors enable domain mapping of functional concepts.

Examples (14) and (15) show how metonymy builds on the contiguity relations in a gestaltistically perceived event frame and its associated parts. Focusing on frame relations enables new FCs to be created, which can be used as properties.

- (14) Ge. *greifen* ‘to grasp’ → *begreifen* ‘to touch, seize’ → (result) *begriffen haben* –meton→ *der Begriff* ‘s.th. having been seized (with the head)’ → ‘concept’
- (15) Gr. *keisthai* ‘to lie’ → *hypokeisthai* ‘to lie under’ → *hypokeímenon* ‘lying under’ –meton→ *to hypokeímenon* ‘s.th. underlying (an attribute)’

Metaphors, on the contrary, stipulate similarity between events or objects and allow knowledge to be transferred from a known domain to a less well-known domain by a change in frame-settings. Reapplying metaphors facilitates knowledge transfer between the different domains.

- (16) Lt. *aquam trulleo concipit* ‘he catches water in a scoop’
–metaph→ Lt. *aliquem conceptum utero habere* ‘to have s.b. taken in the uterus’
[UTERUS = RECIPIENT]
–metaph→ *mente concepta* ‘(s.th.) caught in the mind’ [MIND = RECIPIENT]

Once fully developed, FCs are qualified to perform domain specific functions. The following example shows ongoing definitional refinement of an FC, which allows different dimensional values to be assigned to its referents.

- (17) Gr. *to hypokeímenon* ‘s.th. underlying (an attribute)’ [ontological meaning]
 → *to hypokeímenon* ‘s.th. forming the basis of (a proposition)’ [logical meaning]
 –50 a.c. → Lt. loan translation *subiectum* ‘subject’ [ontological, logical meaning]
 –14e s. → MFr. loan translation *subjet* ‘subject’ [ontological meaning]
 –1580 → Fr. loanword *sujet* ‘subject’ [logical meaning]
 → *le sujet d’une discussion* ‘subject of a discussion’ [communicative meaning]
 → *le sujet d’un roman* ‘subject of a novel’ [literary meaning]
 → *le sujet d’un tableau* ‘subject/theme of a picture’ [pictorial meaning]
 → *le sujet d’une fugue* ‘subject/theme of a fugue’ [musical meaning]

Within a domain it might be necessary to either restrain or adapt the meaning of the FC transferred by definition.

- (18) Fr. *le sujet d’une fugue* ‘thème ou motif principal dans la musique contrapuntique’

Goal 4. The role of mental imagery in FC-formation

Since FC formation starts from perceptual and action experience, the event concepts are part of image schemas relying on PERCEIVING and DOING, which are consequently appropriated for COGNIZING, UNDERSTANDING and KNOWING. Frequent schemas are based on grasping an object and ensuing manipulation, such as ‘collecting objects to form a whole’, ‘dividing an object into its parts’, ‘ordering objects relative to others’, etc.:

- (19) COLLECTION and CONTAINMENT → *concipere* < *con-capere* ‘to grasp together’; *logos* ‘the collected’ < *legein* ‘to collect’²
- (20) SPLITTING a WHOLE → *differentia* < *dif-fere* ‘to carry away’; *abstractio* < *abs-trahere* ‘to pull away’; *analysis* < *ana-lyein* (lit.) ‘to loosen up’; *kritikos* < *krínein* ‘to separate’
- (21) POSITION relative to SURFACE → *hypokeímenon* < *hypo-keisthai* ‘to lie under’; *hypothesis* < *hyphistani* ‘to stand under’, *subiectum* < *sub-iacere* ‘to lie under’; Ge. *Untersuchung* ‘scrutiny, probe, examination’ < Ge. *untersuchen* ‘to search under’

A restricted set of perception, posture and action verbs, either alone or combined with a handful of locational and directional particles, seems to be a convenient remedy for all denotational needs. The following example shows proliferation of French nouns from a single sensory-motor verbal base in Latin:

- (22) Lt. *capere* → 1. concept, 2. conception, 3. conceptualisation, 4. conceptualisme, 5. préconception, 6. percept, 7. perception, 8. perceptibilité, 9. perceptionnisme, 10. apperception, 11. acception, 12. acceptation, 13. acceptabilité, 14. anticipation, 15. principe, 16. emancipation, 17. participe, 18. participation, 19. capacité, etc.

Goal 5. Pursuing the formal development of FCs

Goal 5.1 Deverbal noun formation

The project will concentrate on deverbal nominalization, given that the transition from event

² After an act of grasping we may metonymically conceive the “grasped” as stored in the mind.

frames to attribute frames seems to be decisive for concept development. On the contrary, deadjectival nouns derived from descriptive adjectives like *long* → *longueur* show only minimal semantic change during their transition from property to functional concept.

Because older stages of Indo-European represent a synthetic language type with clear inflectional verb-noun-distinctions, the transition from a verbally expressed sensory-motor base to a nominally expressed FC entails complex morphological and syntactical adaptations. In Ancient Greek, for example, verbs could be converted to nouns derivationally using either non-finite verb forms or suffixes. This language disposed of infinitives and participles for nearly all finite paradigms and made ample use of them:

- (23) Gr. *hístamai* [1P.Pres.Act] ‘I cause (s.th.) to stand’ → *hístamai* [1P.Pres.Med.] ‘I make me stand, come to stand’ → *parhyphístamai* (lit.) ‘I gradually come to stand below’ → *parhyphístámenon* [Part.Pres.Med.Neutr] ‘gradually coming to stand below’ → *to parhyphístámenon* [VerbalNoun.Neutr] ‘the settling sediment’³
- (24) Gr. *hairéō* [1P.Pres.Act] ‘to take’ → *aphairéō* ‘I take away’ → *aphairesis* [Nomen actionis] ‘the taking away’ → Lt. (loan translation) *abstractio* ‘abstraction’
- (25) Gr. *témnō* [1P.Pres.Act.] ‘I cut’ → *tomós* [Part.Perf.Act.Neutr] ‘cut’ → *tómos* [Nomen rei actae] (lit.) ‘the cut’ → *tomé* [Nomen actionis] ‘the cutting’

As example (24) indicates, abstraction often set in with resultative *to*-participles. A past participle like Gr. *dialytos* ‘dissolved’ was assigned the meaning *dissoluble*, because a thing which has been *dissolved* once is potentially *dissoluble* and *dissolubility* becomes one of its properties (see also Gr. *átomos* ‘undivided’ and ‘undivisible’, *akínētos* ‘unmoved’ and ‘unmoveable’, *adiástatos* ‘unextended’ and ‘unextendable’, Lt. *invictus* ‘undefeated’ and ‘undefeatable’).

Some suffixes, like Gr. *-sis*, *-ia*, were specialized from the 5th century BC on to form verbal nouns and made it easy to build abstract nomen actionis (Chantraine 1979). Probably influenced by Greek models Latin and European vernaculars molded functionally equivalent suffixes like Lt. *-io*, *-us*, En. *-ing*, MHGe. *-heit*, *-ung*, OFr. *-age*, *-ment*, *-ée*, etc.

Deverbal nouns often comprise both sortal and functional readings and thus make concept formation readily observable. Many cases even show ambiguity among readings, which may indicate pre-established points where modification occurs in a radial semantic network. Otherwise, it is difficult to distinguish between sortal and functional readings without having supplementary contextual or situational information. French is equipped with highly polysemous deverbal nouns like *chauffage*, *collection*, *composition*, *barrage*, *publication*, *corruption*, etc., which show fine-graded transitions from sortal event readings on the basis of resultative readings to functional readings or even sortal object readings.⁴

- (26) Fr. *chauffage* – 1. [sortal event reading] Le chauffage de l’eau de piscine a duré longtemps. – 2. [sortal object reading] Le chauffage central de la maison est ré-

³ In uroscopic texts this word denotes the settling sediments of the urine and was translated into Latin as *contentum* or *sedimentum* (see project B5 for discussion).

⁴ Inventoring FC-readings in deverbal nouns has proved to be a time-consuming task. What is most annoying is a seemingly constant need for disambiguation in context, which makes it necessary to include many examples from historical texts to establish an approximative chronology for the different type shifts.

paré depuis ce matin. – 3. [functional reading] Le chauffage de la maison a coûté cher ces dernier mois.

As a predominantly analytic language and scarcely influenced by Classical models, Old French encouraged non-affixed deverbal noun formation.

(27) OFr. *destiner* ‘to fix, to determine’ –1160→ *destin* (n.m.) ‘fixing, determination’ → ‘destination, fate’

(28) OFr. *adresser* ‘to direct to’ –13e→ *adresse* (n.f.) ‘right way’ → ‘indication (of the right way)’ → ‘address’

Goal 5.2 The rise of articles

The rise of the definite article in association with an abstract noun in Greek is a largely debated phenomenon. It has been linked to the inception of a new philosophical and scientific concept formation by Snell and others (Snell 1975, ch. 12). Because FCs attribute a single value to a possessor they are definite, in spite of their abstractness (see A1 for a discussion of definiteness with FCs).

Latin does not possess articles and translating Greek philosophical texts posed enormous problems. For example Cicero had to translate *tò agathón* ‘the good’ by circumscribing the concept as *id quod (re vera) bonum est*. It was not possible to translate verbatim, because Latin did not possess a corresponding grammatical category. Old French slowly began to develop a definite article, which spread from sortal nouns to nouns denoting FCs. In this instance, parallels can be drawn to the use of articles in Bible versions translated from Greek.

3.2 Methods and work schedule

Methods

1. Defining the semantic and grammatical characteristics of FCs: Assembling diachronic evidence, the project proposes to substantiate the hypothesis that FCs constitute a separate concept type. Our focus is on FC-formation through verb to noun conversion. This conversion involves decategorizing verbs and recategorizing them to nouns (see Malchukov 2004 for discussion). Inflectional languages with complex NP-framing effect this change by employing mixed categories (in particular infinitives and participles) or suffixation (see project report).

2. Confining the sensory-motor foundation of FCs: The project will attempt to prove that FCs start from pre-conceptual schematic representations that build on perception and sensory-motor experience. These representations are structured by contiguous part-whole-relations, which can be profiled for FC-development.

Research will be done to fix the starting points of FCs in French (including Greek and Latin roots with loaned FCs). It is anticipated that etymological evidence will allow a set of perceptual and sensory-motor abilities to be established, which can subsequently be corroborated by neurological evidence. The other concepts derive their inferential structure via mappings from these embodied structures (see Lakoff & Nuñez 2000, Chang, Feldman & Narayanan 2004).

3. Identifying associative processes: The project will elucidate on associative processes, which transform perception-based concepts to FCs. Profiling a part-whole-relation metonymi-

cally might establish a FC that can be abstracted from particular object instantiations of the event. It can be demonstrated how sensory-motor concepts (structured through part-whole-relations) are transformed to concepts employed in abstract reasoning (structured through associative and hierarchical relations). FC-formation can be characterized by a transition from concrete to abstract, from a dominantly expressive to a logically inferring and defining knowledge representation.

4. Outlining history of science: The history of Western thought and ideas has been described from a variety of perspectives. However, research in this area provides quite a variety of theoretical positions and lacks the prerequisites germane to cognitive semantics and neurosciences. The project will concentrate on FC-formation in linguistic domains like grammar, rhetoric, lexicography and pedagogy. It will represent a small-scale pilot study, rather than a full-fledged analysis of FCs in all scientific domains (e.g. frames for grammatical and rhetorical concepts).

A4

Time schedule

2008/2	Tracing FC-development for selected French deverbal nouns by means of dictionaries (Goal 1); defining the sensory-motor foundation of FCs in French (Goal 2)
2009/1	Tracing FC-development for selected French deverbal nouns by means of corpora (Goal 1); defining the sensory-motor foundation of FCs in French (Goal 2)
2009/2	Systemizing the formal development of French FCs (Goal 5); identifying associative processes in FC-formation (Goal 3)
2010/1	Systemizing the formal development of French FCs (Goal 5); identifying associative processes in FC-formation (Goal 3); correlating mental imagery and FC-development in science (Goal 4)
2010/2	Systemizing the formal development of French FCs (Goal 5); correlating mental imagery and FC-development in science (Goal 4)
2011/1	Typology of semantic and grammatical developments in French FC-formation (Goal 1-5)

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A4

3.3 Experiments involving humans or human materials

yes no

3.4 Experiments with animals

yes no

3.5 Experiments with recombinant DNA

yes no