

Investigating Language Cognition: The View from Multimodality

1. Short project summary

We propose a research group whose agenda is to investigate the human language faculty and its cognitive underpinnings from a multimodal perspective that pushes research and teaching beyond the confines of traditional boundaries on the study of human language. We will pursue the investigation of human language from a perspective that spans other areas of human cognition, such as vision, dance and music; we will apply both linguistic and non-linguistic methodology (such as game theory) to these areas. The overarching idea is that we will thus gain new insights into central aspects of human cognition, as instantiated by natural language.

2. Name and departmental affiliation of the project participants

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|---|------------------------------|
| [1] Pritty Patel-Grosz, ILN (project co-leader) | [7] Kjell Johan Sæbø, ILOS |
| [2] Patrick Grosz, ILN (project co-leader) | [8] Atle Grønn, ILOS |
| [3] Dag Haug, IFIKK (project co-leader) | [9] Alexander Jensenius, IMV |
| [4] Andreas Sveen, ILN | [10] Øystein Linnebo, IFIKK |
| [5] Helge Lødrup, ILN | [11] Bruno Laeng, PSI (SV) |
| [6] Marja Irmeli Etelämäki, ILN | [12] Stephan Oepen, IFI (MN) |

This proposal, as submitted to the faculty by ILN, has also been anchored in the IFIKK board.

3. Details about any groups outside HF which are relevant partners

As outlined above, researchers from MN (Oepen) and SV (Laeng) will participate in the proposed group. External collaborations are planned with a range of institutions:

External Collaborators

- | | |
|--|---|
| [1] Agustin Rayo (MIT) | [5] Kate Maxwell (UiT Musikkonservatoriet) |
| [2] Daniel Altshuler (Hampshire College) | [6] Stewart Shapiro (Ohio State University) |
| [3] Gillian Ramchand (UiT) | [7] Anton Zimmerling (Moscow State Ped. Uni.) |
| [4] Arnfinn Muruvik Vonen (HiOA) | [8] Salvatore Florio (Birmingham University) |

4. Description of project objectives (challenges it will help to resolve) and social impact

This project aims at furthering our core understanding of human cognition in its manifestations (e.g., language, music, and dance); by doing so, it also addresses fundamental issues that our society faces in the current day and age, where artificial intelligence is more strongly integrated into daily life and research on human-robot interaction is gaining in importance. Our research will shed insights on the differences between the human mind and artificial intelligence, as well as pave new roads in our understanding of the emerging needs in human-robot interaction (including areas such as speech act encoding, gestures, aesthetic discourse, non-linguistic communication, subjectivity, emotivity, and sentiment analysis). In line with the recent white paper on the humanities in Norway (Meld. St. 25 [2016-2017], *Stortingsmelding om humaniora i Norge*), such advances are timely, necessary, and of societal relevance; on the one hand, they contribute to our society's needs to successfully meet the ongoing shifts in technology and the challenges that arise from them; on the other hand, they contribute to the relevance of humanities research for the current labour market and present-day working life, contributing to an increased potential for interactions and interconnectivity between the humanities and the sectors of business and industry.

5. Description of cooperation and interdisciplinary aspects of the project

This FP3 project has an interdisciplinary orientation, covering, in particular, the fields of Linguistics (ILN/ILOS/IFIKK), Musicology (IMV), Psychology (PSI), Philosophy (IFIKK) and Informatics (IFI). It is thus, by its very design, geared towards interdepartmental collaboration. As outlined in section 8.2 of this proposal, there is a significant potential for co-teaching across departments (e.g. a course on language and music taught by Pritty Patel-Grosz with guest lectures

by Alexander Jensenius, or a course on the philosophy of language taught by Dag Haug with guest lectures by Øystein Linnebo and Kjell Johan Sæbø). Based on initial discussions with ILN leadership, part of the group's setup is to establish a shared space in the form of a common room located in Henrik Wergelands hus, which will enable project participants to gather, hold meetings and seminars, and have research-related discussions.

6. Description of the project's innovative potential

The topics that this project will cover (as outlined in section 8.1) are, as of now, largely under-researched and unexplored; this is particularly evident from the investigation of topics such as: connections between dance and music (see TS1 in sect. 8.1), object representation from a multimodal and interdisciplinary perspective (see TS2 in sect. 8.1), connections between linguistics and other disciplines in the study of subjectivity and emotions (see TS3 in sect. 8.1), and the grammatical encapsulation of physical phenomena as a consequence of face-to-face interaction (see TS4 in sect. 8.1). The last decade has seen a surge in applying linguistic methodology to other areas of human cognition (such as music and dance), generating the potential to obtain a deeper understanding of the human mind. The group of collaborators at UiO (and beyond) gives rise to a unique bundling of competencies, which forms the basis for true progress in these areas.

7. Description of the project's potential for attracting external funding

This project will provide its members with essential infrastructure and resources to prepare successful ERC Starting/Consolidator/Synergy Grant proposals, which in turn would contribute to the overall success of the University of Oslo, and, more generally, of the humanities in Norway, in securing funding from the European Research Council. The project will also create foundations for an application for a new, cross-disciplinary Centre of Excellence at HF. This would complement the work of prior and ongoing CoEs at HF, in particular CSMN and RITMO; however, it would differ from earlier language-based CoEs such as MultiLing in that we address fundamentally different fields of research in linguistics. Our project members have expressed an interest in establishing such a new CoE, which would directly build on this FP3 group, thus creating a more permanent and self-sustaining research environment.

Given its broad orientation, this FP3 group can also make connections to thematic calls from both the Forskningsrådet and the ERC, such as, for instance, the ERC's DT-TRANSFORMATIONS-11-2019: "Collaborative approaches to cultural heritage for social cohesion". Multimodal studies at the interface of language, music and dance not only lend themselves to a deeper understanding of human cognition, but also allow for investigations of how music and dance as art forms that are rooted in a given culture are connected to the language(s) of the respective cultural group.

8. Description of both the research and instructional components

8.1 Research components

Our research program investigates a breadth of topics pertaining to multimodality, such as (but not limited to) the syntax/semantics of dance and music, and the psychological/philosophical analysis of subjectivity, perception and perspective in natural language (compared to other modes of communication). The underpinnings of such research will be formed by research in the core linguistic fields of syntax, semantics, pragmatics and their interfaces. While we aim at full interaction amongst all members of the FP3 group, *thematic subgroups (TS)* can be defined:

TS1 – Language and Dance/Music: Connections between areas such as linguistics with dance and music will be explored in close collaboration between members of ILN (**P. Patel-Grosz**, **P. Grosz**) with researchers at IMV (**A. Jensenius**) and external collaborators such as **K. Maxwell** (UiT Musikkonservatoriet). Together with colleagues at PSI (**B. Laeng**), we will explore topics such as the division of labour between vision and language (i.e., the cognitive module encompassing natural language semantics) with regards to phenomena such as referent-tracking and disjoint reference in visual narratives (e.g., narrative dance / wordless picture sequences). Connections between

language and vision will also be made at the level of how direct vs. indirect perception is linguistically encoded (**A. Grønn; G. Ramchand**).

TS2 – Object Representation: Collaborations that involve philosophers at IFIKK aim at exploring the representation of abstract objects and abstract reference in iconic meanings (as constituted, say, by different sequences in dance and music; **P. Patel-Grosz**); this exploration includes topics such as (**Ø. Linnebo, D. Haug, K. J. Sæbø**, with external collaborators **D. Altshuler, S. Florio, A. Rayo, S. Shapiro**): [i.] plurality and how it is conceptualized / realized at the intersections of philosophy, linguistics, and logic, [ii.] reference to abstract objects in philosophy and semantics, [iii.] generality and quantification in philosophy, logic, and semantics. Such topics also tie in with the general question of linguistic reference and perception (**M. Etelämäki, H. Lødrup**), and whether human perception is related to/grounded in human action).

TS3 – Subjectivity: We investigate the question of how language, emotions and the moving body relate to each other in conversation and beyond (**M. Etelämäki, A. Sveen, A. Jensenius**); in particular, one may ask if a pragmatics of narrative dance that can be compared to pragmatics in natural language use is conceivable (**A. Sveen**). A central phenomenon that ties in with these matters is subjectivity in language and how it translates to other modes of communication and impacts on public discourse. As a relatively novel topic in linguistic semantics, subjectivity is, by its definition, an interface topic that provides rich opportunities for interlocking with neighbouring disciplines and for engaging with questions of general interest (spanning the areas of spoken and written natural language meaning, other sub-disciplines of linguistics and other disciplines in the humanities and social sciences), including (in collaboration with, e.g., **K. J. Sæbø**): [i.] the cross-disciplinary study of speech acts, a core concern of pragmatics and the philosophy of language (**A. Sveen, P. Grosz**), [ii.] the study of different modes and modalities of language: Sign languages (e.g. in collaboration with **A. M. Vonen**), gestures, specific text genres, like opinion polls or aesthetic discourse; this, in turn, sheds new insights for our understanding of the sociality and intersubjectivity of humans (**M. Etelämäki**), [iii.] the study of non-linguistic modes of communication, in particular, aesthetic modes of expression, as instantiated by music and narrative dance (**P. Patel-Grosz**), [iv.] subjectivity and sentiment analysis, a lively field in natural language processing and language technology (**S. Oepen**), [v.] the study of emotional and sensory information processing in cognitive psychology (**B. Laeng**).

TS4 – Semantics and Pragmatics / Grammar and Cognition: More closely connected to canonical linguistic investigation, our FP3 group aims at investigating the interface between grammar and extra-grammatical phenomena, which is most clearly pronounced in the area of pragmatics. Multimodality in these areas concerns the role of the interlocutors' bodies in face-to-face interaction, which raises questions on the relation between language and body (**M. Etelämäki**), such as: When and how do bodily elements become part of grammar? How do (speech-accompanying) gestures relate to talk-in-interaction “enchronically”, i.e., in the *conversational time* (a time-frame that describes how language evolves within communicative sequences, contributing to our understanding of language development throughout a person's lifespan)? Such questions bear centrally on the role of pragmatics in conversation (**A. Sveen**), and on its delineation from grammar, an area that subsumes the notoriously complex role of pragmatics in the grammatical licensing of reflexive elements (e.g., Nw. *seg selv*) and anaphoric phenomena (such as the occurrence of *det* in *Det kjøpte Bjørn også*. ‘Bjørn bought one too.’) (**H. Lødrup**). Our planned collaborations extend to a comparison of language with strategy games such as chess (**A. Grønn**; with **A. Zimmerling**), which we view as two manifestations of human cognition (that share processes such as *planning* and *reacting*). Both allow us to learn about the differences between the human mind and artificial intelligence. Potential research areas not only include a comparison of how game-theoretic considerations play out in chess vs. language, but also questions concerning a possible compositional semantics of chess moves.

The research collaborations will be strengthened and integrated by virtue of a colloquium series with invited international speakers, which will be a regular event (4-6 talks per year) throughout the FP3 cycle. In terms of project infrastructure, experimental studies to be carried out in TS1-TS4 (such as motion-capture investigations of dance sequences) will draw on existing resources such as the facilities at the Centre of Excellences RITMO (at IMV) and MultiLing (at ILN).

8.2 Instructional components

University education in the present day and age faces a range of challenges, a number of which are addressed in recent white papers issued by the Norwegian government, such as the white paper on quality culture in higher education (Meld. St. 16 [2016-2017], *Kultur for kvalitet i høyere utdanning*) and the white paper on the humanities in Norway (Meld. St. 25 [2016-2017], *Stortingsmelding om humaniora i Norge*). The latter, in particular, puts an emphasis both on maximizing the opportunities of outstanding students and on increasing the relevance of humanities research beyond the core disciplines. We firmly believe that this is particularly important at the BA and MA level, which will be our first priority. In the educational part of our FP3 project, we aim to furnish students with research-based courses that integrate current cross-disciplinary research. Moreover, our eventual goal (towards the end of this FP3 phase) is to establish an English-language BA study program in cognitive science, which will be truly interdisciplinary and cross-departmental.

Such a study program in cognitive science, which is timely in our present day and age, will address HF's current goals (as captured also by UiO's *strategi 2020*) of internationalization (with extended recruiting of international students even at the BA level) and of interdisciplinarity. Furthermore, it will create a suitable environment for excellent and broadly gifted BA students who are still on the search for the right degree program and study goals at the onset of their studies. The diversity of such students is not catered for by traditional study programs, which are firmly focused on a given field from the beginning. We believe that some of the existing dropout (*frafall*) across the humanities in Norway can be linked to a conflict between the diverse interests of excellent students and the structures of traditional study programs that do not cater for such diversity. The breadth of the BA in cognitive science that we outline in sect. 8.2.4 tackles this challenge by allowing these outstanding students to start with broad interdepartmental foundational training, followed by a later specialization (e.g. on computer science, cognitive psychology, or linguistics) after their first year. The proposed program provides an alternative to current program structures in that it has a broader base and enables students to move between departments. By giving outstanding students more choice and flexibility, we thus contribute to two further goals in the white paper on the humanities, namely to support particularly gifted students, and to further reduce dropout in the humanities, complementing the strategies that HF is already putting in place.

Of course, establishing new study programs is a long process that is not without challenges. To tackle such challenges, we propose a three-step plan for implementing the educational component of our FP3 proposal.

8.2.1 Overview of our three-step plan (including the potential for developing lasting cooperation and the plans for phasing in the project once funding has ceased)

This section outlines the three-step plan that we propose as part of the educational component of our FP3 group. Crucially, we apply for two permanent (*førsteamanuensis*) positions, one of which will be integrated into ILN after the end of the FP3 cycle at the end of 2023, while the other will be integrated into IFIKK. The respective departments have expressed a commitment to carrying on the relevant positions after the end of the FP3 project. In particular, at the level of ILN, leadership has expressed support for the new position that we are requesting as part of the FP3 group to be announced in 2019 for 2020. This means that the new *førsteamanuensis* may be able to start teaching in 2020 (or 2021 at the latest).

Step 1: new elective courses – In the short-term perspective (prior to hiring the new permanent staff members; approx. 2019-2020), we introduce new elective courses, which will be established as elective part of the *BA in linguistics* at ILN or as part of the *BA in philosophy and history of ideas* at IFIKK. Of course, since the linguistics program (as the main host) currently has a teaching faculty of 5 members (compared to 9 members 10-15 years ago), we will be working with limited resources and can only make commitments in line with these limited resources. For instance, it would be too risky at this step to establish a new *minor* (which at UiO consists of 40 ECTS and is thus called a ‘40-group’ or ‘støttegruppe’), which requires a commitment to offer courses on a regular basis.

Step 2: new minor (40-group) – At the intermediate level (once the new permanent staff members are hired; approx. 2021-2023), we plan to introduce a new minor (40-group), which will include the courses that we introduced at Step 1. The goal is to achieve more visibility across departments and higher student numbers; moreover, this 40-group will be a guaranteed legacy of our FP3 group. As the establishing of a new 40-group requires a guarantee that the 4 classes that it consists of are taught regularly, this is the initial motivation for the hiring of two new permanent faculty members; we currently have resources to teach the classes of the BA linguistics plus a limited number of new elective courses, and we also plan to submit grant applications which may entail a mandatory commitment to research (and thus a buy-out [*frikjøp*] from teaching); the new permanent faculty members will thus contribute a long-term perspective to the educational component of our FP3 proposal.

Step 3: BA study program in cognitive science – The leadership and board at HF/UiO have consistently encouraged cross-disciplinary (‘tverrfaglige’) efforts, not least when announcing this new round of *faglige prioriteringer* (FP3). Cognitive science is by its very nature a cross-disciplinary undertaking. Once we have reached Step 2, the long-term perspective (Step 3), for which the 2 new permanent faculty members (already operative in the new 40-group at this point) will be central, is to establish a new BA study program in cognitive science. We aim to complete this process by the conclusion of this FP3 cycle in 2023. We believe that offering students a structured path into this field at HF will strengthen – and broaden – our appeal when it comes to recruiting students (both in Norway and internationally). Following models such as the model at the University of Bergen, this will require extensive negotiations across departments and faculties. The new faculty members are expected to play a major role in these developments, making ILN essential in bringing about this new BA program.

8.2.2 Step 1: new elective courses

Immediately from the onset of our FP3 project, we introduce new elective courses at the 1000-level and the 2000-level. In line with the eventual aim of integrating them into a BA program in cognitive science, we propose the course code KOG (i.e. KOG1XXX and KOG2XXX) for these courses. The goal is to start with one 1000-level course, which will be based in the philosophy and history of ideas program at IFIKK, and two 2000-level courses, based in the linguistics program at ILN. The main project leaders (Pritty Patel-Grosz, Patrick Grosz, and Dag Haug) will be operative in establishing these courses and contribute to the teaching. At this stage, we work towards the long-term goal of establishing a new minor (i.e. 40-group) and (eventually) a BA program in cognitive science. There will thus be a focus on developing rapport with other departments at this stage.

Due to constraints in allocating resources at the administrative level, project members in this FP3 group who are not in charge (*emneansvarlig*) of a given course see themselves as flexible with respect to the establishment of cross-disciplinary links at this stage of the FP3 cycle. While existing structures do not encourage co-teaching across departments, such co-teaching can practically be achieved by exchanging teaching resources on a quid-pro-quo basis (assuming reciprocity to ensure that teaching obligations and study-point incomes are evenly shared in the long run). Project members will thus take a practical approach (both in the new BA courses and in MA specialization courses) to bringing about interdepartmental options for the students in topic areas such as: *meaning in vision and language* (ILN/PSI/IFIKK), *music and language cognition* (ILN/IMV), *evaluativity*

and sentiment analysis (ILN/ILOS/IFI), aesthetic discourse and music criticism (ILN/ILOS/IMV), linguistics and game theory (ILN/ILOS/IFIKK), semantics and philosophy (ILN/ILOS/IFIKK), psychology of language (ILN/PSI), as well as the philosophical underpinnings of pragmatics in natural language research, psycho- and neurolinguistics (ILN/PSI/IFIKK); such co-teaching will be implemented in terms of guest-lecturing in each other's classes on a quid-pro-quo basis.

The main new courses that we aim to establish at this point can be outlined as follows.

KOG1XXX – <i>Overview of cognitive science (Oversynskurs i kognitiv vitenskap)</i> – 10 ECTS; elective – Introduction to cognitive science, covering core areas such as vision, language and higher cognition (e.g. decision making); this will be integrated into the “philosophy and history of ideas” BA programme, co-taught with project members from linguistics, and involving guest lecturing from project members in musicology, informatics, or psychology.
KOG2XXX(a) – <i>Language and cognition (Språk og kognisjon)</i> – 10 ECTS; elective – Introduction to the interconnectivity of language and other areas of human cognition (such as music); this will be integrated into the linguistics BA programme, involving guest lecturing from project members in musicology, psychology, or philosophy.
KOG2XXX(b) – <i>Methods in language and cognition research (metoder i språk- og kognisjonsforskning)</i> – 10 ECTS; elective – Introduction to methods and tools for investigating language cognition from a multimodal perspective; this will cover fieldwork, corpus-linguistics, experimental or language processing methods. This course will be integrated into the linguistics BA programme, involving guest lecturing from project members in musicology, psychology or computer sciences.

The proposed classes explicitly aim to integrate current research, and while classes are based in ILN (KOG2XXX(a) and KOG2XXX(b)) and IFIKK (KOG1XXX), the topics span several departments that have a language focus (ILN, ILOS, IFIKK) or a focus on research with affinity to language (IMV, PSI, IFI), as outlined in this proposal. The immediate impact of introducing such classes will be to give current BA students the option of including designated cognitive-science-based contents and knowledge into their specialization. In line with the faculty's strategic goal of increased internationalization, the three new classes will be taught in English, which will also make them attractive to exchange students (e.g. through the Erasmus exchange program). The establishing of KOG2XXX(a) and KOG2XXX(b), as outlined above, makes an additional contribution to the ongoing reprofiling of the linguistics study program in line with (and benefitting from) recent hires (Grosz, Patel-Grosz, Næss, and Haug to a 50% appointment).

For the practical implementation, the new classes will be taught by the newly hired permanent staff that we propose at the level of førsteamanuensis from 2020 or 2021 onward. In the initial phase (prior to and during their hiring, from 2019-2020), these classes, which form part of the regular elective course offering, will be covered by members of the FP3 group in the course of their regular teaching duties. Since these will be three new courses per year (KOG1XXX, KOG2XXX(a), KOG2XXX(b)), this is fully within capacity; for instance, P. Patel-Grosz could be in charge (*emneansvarlig*) of KOG2XXX(a) twice (H2019 and H2020), P. Grosz could be *emneansvarlig* for KOG2XXX(b) twice (H2019 and H2020), and Ø. Linnebo could be *emneansvarlig* for KOG1XXX twice (V2019 and V2020), prior to the hiring of the new permanent faculty, who would take over teaching of all three classes.

In addition to these additions at the bachelors level, FP3-related content can be integrated into MA classes from the specialization module of the regular teaching schedules (e.g. existing classes such as LING4120, LING4130, etc., which have previously also included FP3-relevant topics such as cognitive linguistics or corpus-linguistics). The idea at the MA level would be to have a language-oriented specialization course with an interdisciplinary component, which would be highly relevant to current students in the MA linguistics program. Project participants have agreed to guest lecturing on a quid-pro-quo basis, which will allow for the integration of topics such as “aesthetic discourse and music criticism” or “linguistics, chess, and game theory”, with suitable guest

lecturers amongst the project participants, such as K. J. Sæbø or A. Grønn. The interdisciplinary, cross-departmental focus is on bridging linguistics and other disciplines. In the long-term perspective, the hiring of two new permanent faculty members will provide extra capacity that allows us to maintain designated interdisciplinary MA specialization courses at a later stage.

In line with the recent white papers (*Kultur for kvalitet i høyere utdanning* and *Stortingsmelding om humaniora i Norge*), which, amongst other things, emphasize student-centred approaches to learning, specialization seminars at the MA level allow for both traditional course formats and more innovative formats that include: [i.] an inter-paradigmatic course on competing (or parallel) approaches to language and grammar that is given dialogically, involving a discussion between two teachers in interaction with the students; [ii.] a collaborative course (as pioneered by K. J. Sæbø at the University of Chicago in 2013) in which participants identify a research problem and develop a solution in the course of the term, resulting in a joint presentation, or even a submission for a conference.

Moving beyond the BA and MA level, courses with more innovative formats have particular relevance at the PhD level, where we propose to establish advanced classes that are taught on a regular basis during the FP3 cycle. We plan to organize such PhD teaching in collaboration with *LingPhil* (the Norwegian Graduate Researcher School in Linguistics and Philology) as a suitable funding body, with the aim of inviting international faculty for day-long or week-long courses, and integrate the resulting PhD courses into the FP3 group. In line with the focus on improving the quality of PhD-level training that is given in the white paper on the humanities (*Stortingsmelding om humaniora i Norge*), PhD courses will cover topics such as [i.] advanced research skills and methodology, and [ii.] societal impact/relevance of humanities PhDs (e.g., how natural language research bears on societal challenges in areas such as public discourse and artificial intelligence). To guarantee the establishment of PhD-level training regardless of funding decisions on the part of *LingPhil*, we budget 100,000 NOK per year (i.e. 500,000 NOK in total for the FP3 cycle).

More generally, the collaborative and dialogue-oriented nature of innovative teaching formats aims at strengthening collaboration within the student community, thus meeting key faculty objectives such as a further reduction of student dropouts. In addition to pursuing new cross-disciplinary courses, project members (some of who previously co-taught cross-departmental courses, e.g., SPR4103 and SPR4106) have shown interest in developing the interdisciplinarity of established courses within the regular curriculum (such as LING2100/4118 [SemPrag2]), and committed to guest lecturing across disciplines. We expect that the interdisciplinary orientation (coupled with an emphasis on relevance beyond the humanities) will have an immediate impact of not only providing a broader range of options to BA students in linguistics and in philosophy, but also of recruiting more students who are eligible to take the proposed classes as electives.

8.2.3 Step 2: establishing a new minor (40-group)

While psycholinguistic research in Europe may have traditionally been rooted in ‘applied linguistics’ (as opposed to ‘general linguistics’), recent years have seen a fusion of language research and research in the cognitive sciences at the level of foundational research (*grunnleggende forskning*); this is reflected by the recent establishment of research initiatives such as the University of Maryland’s *Language Science Center*, among many others. Research on language and cognition is, by its very nature, interdisciplinary, while maintaining a designated theoretical orientation in line with the research carried out by the project leaders (P. Patel-Grosz, P. Grosz, and D. Haug). As outlined above, we request two new permanent positions at the level of *førsteamanuensis*, in order to establish a designated profile in this field; both of these will carry out foundational research on language and cognition. Since ILN has committed to support one of these positions after the end of the FP3 cycle in 2023, while IFIKK has committed to support the other position, the designated focus will be on general linguistics in one case and on philosophy in the other case. The hiring of two new permanent faculty members (which should be completed no later than 2020) will allow us to turn the newly established courses into a minor/40-group (under the umbrella title of “Language,

multimodality and cognitive science”). This 40-group will involve the addition of a fourth class (at the 1000-level or 2000-level), bundled with a long-term commitment (based on the newly hired academic staff) to teaching all four classes. Establishing such a 40-group will increase the visibility of the new FP3-related teaching, thus giving rise to a lasting legacy of our FP3 group.

The exact nature of the fourth class will depend on the research foci and secondary specializations of the new faculty members. However, for concreteness’ sake, a suitable 1000-level course (which could be based at ILN) would be on the topic of “Philosophy, pragmatics and cognition (*Filosofi, pragmatikk og kognisjon*)”. This course would give an introduction to the philosophical and cognitive underpinnings of research on pragmatics; it would also incorporate current research and findings in the new field of *experimental pragmatics*, as instantiated by the ongoing German Priority Program *XPrag.de* (and prior to *XPrag.de*, by the *Euro-XPrag Network*, a research networking programme of the European Science Foundation from 2009-2013). The University of Oslo is an active member of the experimental pragmatics community, as witnessed by a recent workshop on “Non-At-Issue Meaning and Information Structure”, co-organized with *XPrag.de* by Pritty Patel-Grosz and Patrick Grosz in May 2017. This provides a good foundation for incorporating this topic into the new 40-group.

On the administrative end, project members will actively seek an exchange with employers in the industry, aiming to strengthen the net gain of students and degree candidates from interdisciplinarity by eventually establishing direct links to the industry (e.g. in the form of commitment to practical placements). Such links, once established, will amplify the impact of our proposed courses. In the present-day knowledge society (with human-robot interaction being an increasingly important sector of industry), interdisciplinary training in language and cognition gives rise to graduates who are more adept at tackling the challenges that our society is facing and will face in the upcoming decades. Relevant learning outcomes not only include an understanding of human language, human cognition, and the connection between the two, but also problem-solving abilities that go beyond the foundational knowledge.

8.2.4 Step 3: establishing a BA study program in cognitive sciences

The hiring of two new permanent faculty members, the establishing of a new 40-group, and the inclusion of interdisciplinary collaborative cross-departmental teaching that we have outlined so far will eventually provide the basis for jointly developing a new interdepartmental BA in cognitive science (to be established at the end of this FP3 cycle, by 2023/2024). While such a degree is timely and exists across many of the world’s universities (including the University of Bergen [UiB]), UiO currently has no comparable degree. In light of UiO’s plans for internationalization (and anticipating the educational environment in 2023 and later), we aim for the BA in cognitive science to be an English-language degree; this sets it apart from UiB’s Norwegian-language degree, giving UiO the edge in attracting excellent international students to Norway (and, specifically, to Oslo) at the BA level. Such a strengthening of the international component in the study programs is in line with strategic goals both at the departmental level (e.g., at ILN) and at the faculty level (HF). In terms of career perspectives, such a BA would naturally lead up to an MA in psychology, linguistics, computational linguistics or philosophy (depending upon the minor/40-group that students choose, as discussed below). Moreover, such a BA has a designated relevance for business and industry (in important sectors such as artificial intelligence, human-computer interaction, data analysis, software development, software engineering, and organizational psychology).

To be truly competitive, a BA in cognitive science will have to be supported by a range of departments. To illustrate, UiB’s *Bachelorprogram i kognitiv vitenskap* is connected to 8 different study programs across departments (information- and communication technology, information science, computer science, computer technology, general psychology, linguistics, philosophy, and digital culture). This can thus only be realized in a long-term perspective. The main idea would be to have a core set of obligatory courses that cover essential areas such as language, logic and programming, as sketched in the following tentative table. At this point, the course code KOG

(which we introduced above) becomes the designated course code for subjects associated with the BA in cognitive science. In order for students who complete the cognitive science BA to qualify for an MA program, they are required to take a suitable minor (støttegruppe/40-group) in an area such as computer science (IFI), philosophy (IFIKK), cognitive psychology (PSY), or music cognition (MUS). Due to its interdisciplinary design, the BA in cognitive science will be set up in a way where this minor qualifies students for pursuing an MA in the respective field. To illustrate, if students take their 40-group in computer science, philosophy, or psychology, this will qualify them for an MA in computer science, philosophy, or psychology, respectively. Such arrangements already exist at UiO; for instance, it is possible to take an MA in Linguistics after having completed a language BA (such as Spanish or Chinese) in combination with a 40-group in Linguistics.

6 th semester	elective courses (fordypningsgruppe)	KOG3XXX – obligatory BA research thesis	free elective courses
5 th semester	free elective courses or international exchange		
4 th semester	KOG2XXX(b) – Methods in language and cognition research [new]	minor (40-group / støttegruppe)	minor (40-group / støttegruppe)
3 rd semester	KOG2XXX(a) – Language and cognition [new]	EXPHIL03 - Examen philosophicum	minor (40-group / støttegruppe)
2 nd semester	PSY2302 - Brain and cognition [existing]	FIL1006 – Introduction to logic [existing]	minor (40-group / støttegruppe)
1 st semester	IN1000 – Introduction to object-oriented programming [existing]	KOG1XXX – Overview of cognitive science [new]	EXFAC03-SPR - Examen facultatum, språkvitenskap

To achieve that the BA in cognitive science is an integrated whole, the *bacheloroppgave* will be an obligatory BA research thesis, the topic of which needs to draw on different disciplines, thus integrating the different subjects through the power of assessment. We will also establish student groups in cognitive science to create a sense of belonging for students through peer activities, to complement the interdisciplinarity and cross-departmental nature of the study program.

From a labour market perspective, graduates from the planned BA program in cognitive science will have a particularly attractive combination of skills, as they will be able to combine knowledge of essential aspects of humans (such as language, cognition and the human brain) with skills such as programming and the tools of computer science. In the present-day society where robotics, artificial intelligence and human-robot interaction are gaining momentum, such skills will become the key to leading roles in the labour market. In the course of their specialization, students will also be able to acquire training in cutting edge technology (including motion capture and eye-tracking), e.g. through collaboration with musicology, where audio and video processing take a central role. This positions the proposed study program in line with the white paper on quality culture in higher education, which emphasizes the importance of technology-assisted education and environmental changes.

8.3 Plans for benchmarking

Given the unique setup of groups within the FP3 initiative, we now address solutions to the challenge of how to achieve comparability, and outline a plan. Specifically, we address benchmarking for the research component separately from benchmarking for the teaching component.

Benchmarking of the research component can be achieved by singling out other projects of a comparable size (e.g. 1 postdoctoral researcher, 2-3 PhD students). To warrant international comparison and competition, we believe that projects within the Research Units and Collaborative Research Centres in Germany are particularly suitable for comparison. Current candidates for comparison could be Project P3 “Alternative Questions” of the Research Unit FOR2111 “Questions at the Interfaces” at the University of Konstanz (established in April 2016), or Project C04 “Conceptual and referential activation in discourse” of the recently established Collaborative

Research Centre 1252 “Prominence in Language” at the University of Cologne. As for the time of evaluation, Collaborative Research Centres in Germany are typically granted for three-year periods and evaluated at the end of such a three-year period; we thus pursue an evaluation of the research output of our FP3 group at the end of the third year (i.e. 2021), as this will also be the time when the PhD positions and the postdoc position that we apply for will come to a conclusion. To carry out the evaluations, we will appoint an advisory committee consisting of three external advisors, at least two of which should be international.

As for the educational component, the courses can be evaluated in relation to established course offerings at HF, within the usual time frames. We evaluate the first three elective courses after 1 year and after 3 years, and we evaluate the new 40-group at the end of the 5-year cycle. These evaluations will enable us to make adjustments to the course offerings, and they will also provide a knowledge base to draw on when establishing a BA study program in cognitive science.

9. Plans for how funding will be used, including activities, measures and new positions

While this will be a cutting-edge group that aims at pushing the boundaries of language research, we adopt a student-centred approach that truly unifies research and teaching. It is our designated goal to integrate outstanding BA, MA and PhD students into the FP3 group, much in line with the recent white paper on the humanities (*Stortingsmelding om humaniora*). This will aid us in producing successful and internationally oriented students, who can then further their academic careers at other international world-class institutions, thus contributing to a further gain in international recognition of UiO and the departments that are involved. In line with these goals, we plan to use the allotted 20 million NOK for the financing of 2 permanent førsteamanuensis positions, one of which will be hosted at ILN and the other at IFIKK, as well as 1 three-year postdoc position, and 2 PhD positions, in addition to research-related project expenses. The project leaders (Pritty Patel-Grosz, Patrick Grosz, Dag Haug) will require 10% buy out (*frikjøp*) from regular teaching obligations per year in order to carry out administrative work in connection with the FP3 group. Finally, we budget a 20% position for administrative support over the course of the 5 years; this position will be operative at various stages of the FP3 cycle, including: hiring of PhD students, postdocs and permanent staff; conference organization; and budget management.

In addition to funding for positions, we plan to establish a colloquium series with invited international speakers who are prominent researchers in the areas of research that our FP3 group covers; this will be a regular event throughout the FP3 cycle. There will be 2-3 talks per semester (i.e. 4-6 per year), and we budget 25,000 NOK per talk.

Additional funding will be used for major international conferences. Specifically, ILN has already committed to be hosting the conference *Generative Linguistics in the Old World [GLOW]* in Spring 2019, which is a major European conference in linguistics and can be used extensively to increase the international visibility of our FP3 group. GLOW is an expensive conference to organize, which is why we make a conservative estimate of 750,000 NOK. Surplus funding (if any) will be used to organize smaller events in the subsequent years of the FP3 cycle.

While, due to the unique nature of FP3 groups, expenses for experiments cannot easily be individuated at this point, the investigation of human cognition requires experiments (e.g. motion capture recordings of dance sequences, psycholinguistic testing, etc.); we will draw on existing resources at the Centres of Excellence RITMO and MultiLing. At the upper end, we estimate that the costs for one 3.5 hour motion-capture recording session including lab rental and post-processing by a research assistant comes to 17,500 NOK. To achieve a conservative estimate of experiment costs, we estimate 12 times this amount (i.e. 210,000 NOK) per year for experiment-related costs (including lab rental fees), i.e. a total of 1.05 million NOK for the 5 years of the FP3 cycle. We also budget 50,000 NOK per year over 4 years for open access publications.

Budsjett faglige prioriteringer 2019-2023

Legg inn tekst, årsverk og beløp i de gule inputfeltene. Beløp blir automatisk beregnet på bakgrunn av gjennomsnittlige lønnstrinn. Lønnsøkning er inkludert. For rekrutteringsstillinger blir det brukt rundsum.

Institutt:	ILN
Fagområde:	
Beskrivelse:	Prioritert område

Aktivitet	Beskrivelse	Hva legges inn?	2019	2020	2021	2022	2023
Professor	Frikjøp (10 % Pritty Patel-Grosz + Dag Haug)	Legg inn årsverk	0,2	0,2	0,2	0,2	0,2
1. amanuensis	1 fulltime position (ILN), 1 fulltime position (IFIKK) + Frikjøp 10% Patrick Grosz	Legg inn årsverk	0,1	2,1	2,1	2,1	2,1
Lektor		Legg inn årsverk					
Prof II		Legg inn årsverk					
Postdok	1 Postdoc	Legg inn årsverk	1	1	1		
Stipendiat	2 PhD	Legg inn årsverk	2	2	2		
Adm.støtte	Adm. support	Legg inn årsverk	0,2	0,2	0,2	0,2	0,2
Drift 1	Conference travel, Phd level training, other operational funds	Legg inn beløp	150 000	150 000	150 000	150 000	150 000
Drift 2	Colloquium series (4 talks per year)	Legg inn beløp	200 000	200 000	200 000	200 000	200 000
Drift 3	Open Access	Legg inn beløp	100 000	100 000	100 000	100 000	100 000
Drift 4	Experiments	Legg inn beløp	210 000	210 000	210 000	210 000	210 000
Drift 5	GLOW / conference budget	Legg inn beløp	750 000				

Egenandel	Beskrivelse	Hva legges inn?	2019	2020	2021	2022	2023
Professor		Legg inn årsverk					
1. amanuensis	Forpliktelsene for stillingen på ILN overtas av instituttet etter prosjektperioden utløper	Legg inn årsverk		1	1	1	1
Lektor		Legg inn årsverk					
Prof II		Legg inn årsverk					
Postdok		Legg inn årsverk					
Stipendiat		Legg inn årsverk					
Adm.støtte		Legg inn årsverk					
Annet 1		Legg inn beløp					
Annet 2		Legg inn beløp					

	2019	2020	2021	2022	2023	Sum
Professor	197 938	202 886	207 958	213 157	218 486	1 040 426
1. amanuensis	80 898	1 741 332	1 784 865	1 829 487	1 875 224	7 311 807
Lektor	0	0	0	0	0	0
Prof II	0	0	0	0	0	0
Postdok	864 664	886 281	908 438	0	0	2 659 383
Stipendiat	1 386 825	1 421 496	1 457 033	0	0	4 265 354
Adm.støtte	119 771	122 766	125 835	128 981	132 205	629 557
Drift	1 410 000	660 000	660 000	660 000	660 000	4 050 000
Sum søknad	4 060 097	5 034 760	5 144 129	2 831 625	2 885 916	19 956 527
Professor	0	0	0	0	0	0
1. amanuensis	0	829 206	849 936	871 184	892 964	3 443 290
Lektor	0	0	0	0	0	0
Prof II	0	0	0	0	0	0
Postdok	0	0	0	0	0	0
Stipendiat	0	0	0	0	0	0
Adm.støtte	0	0	0	0	0	0
Annet	0	0	0	0	0	0
Sum Egenandel	0	829 206	849 936	871 184	892 964	3 443 290
Totale kostnader	4 060 097	5 863 966	5 994 065	3 702 809	3 778 879	23 399 817

	Ltr	Beløp 2017
Professor	77	942 000
1. amanuensis	67	770 000
Lektor	62	701 000
Prof II	75	896 000
Postdok	rundsum	823 000
Stipendiat	rundsum	660 000
Adm.støtte	50	570 000
Drift		

Lønnsøkning hvert år: 2,50%

For lønnstrinn pr stilling er det tatt gjennomsnitt fra Bud
 Beløp er total personalkostnad for de aktuelle lønnstrin

Lønnsøkning på 2,5 % i 2018 og 2019	Beløp 2019	Beløp 2020	Beløp 2021	Beløp 2022
47 689	989 689	1 014 431	1 039 792	1 065 787
38 981	808 981	829 206	849 936	871 184
35 488	736 488	754 900	773 773	793 117
45 360	941 360	964 894	989 016	1 013 742
41 664	864 664	886 281	908 438	931 149
33 412	693 413	710 748	728 517	746 729
28 856	598 856	613 828	629 173	644 903

Idy for heile HF
nene hentet fra Buddy

Beløp 2023

1 092 431

892 964

812 945

1 039 085

954 428

765 398

661 025