

Assessment report
Limited Programme Assessment

Research Master Brain and Cognitive Sciences

University of Amsterdam

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1. Executive summary

In this executive summary, the panel presents the main considerations that have led to the assessment of the quality of the Research Master Brain and Cognitive Sciences programme of University of Amsterdam, which has been assessed according to the NVAO Assessment Framework.

The panel observed programme management has taken up the recommendations made in the previous assessment in 2010/2011. In particular, programme management has taken steps to intensify the contacts with the alumni and to offer software licenses to students. In addition, programme management strengthened the interdisciplinary nature of the programme and the coherence of the curriculum.

In the panel's opinion, the programme's name matches its contents and corresponds to the names of similar programmes.

The objectives of the programme, training students to become experts in their field of interest within the domain of brain and cognitive sciences and training them in the theories and methodologies of multiple disciplines in an interdisciplinary way, are considered by the panel to be valid and valuable. The intended learning outcomes reflect the programme objectives adequately and meet the master's requirements. The objectives and intended learning outcomes of the programme reflect graduates' capabilities to enter PhD programmes. This may be deduced from the disciplinary and interdisciplinary knowledge and skills of the graduates and from their research skills. Graduates may also be eligible for positions outside of academia. The panel appreciates programme management offering this possibility to the students. The Amsterdam Brain and Cognitive Center is considered by the panel to offer a solid basis for the strong research and interdisciplinary focus of the programme. Researchers from various backgrounds work in this center, thereby determining the research and interdisciplinary profile of this programme.

In the panel's view the admission requirements are very adequate and the admission procedures are enforced in a strict way. A substantial percentage of the applications is declined and no more than 60 applicants are admitted per year. The panel advises programme management to install an admission committee and not to involve the Board of Examiners in this process, since this is not a responsibility for the Board.

The curriculum of the programme is an appropriate reflection of the intended learning outcomes, offering theoretical and methodological knowledge and skills as well as academic and research skills. The courses' contents are considered by the panel to be good, the research component is substantial and a satisfactory number of electives is offered.

For the panel, a number of features make the curriculum stand out. These features are the strong element of interdisciplinarity, as exemplified by a number of courses, the track structure, allowing students to work in small groups in their field of interest, offering them a solid basis in the brain and cognitive science domain and enabling them to choose freely their own field of interest in the rest of the curriculum and the *Tesla Minor*, giving students who do not aspire careers in academia the opportunity to prepare for positions in businesses or non-academic organizations. The *Tesla Minor* can be taken extra in this two-year programme. The coherence of the curriculum is satisfactory in the first year but somewhat lacking in the second year. The panel advises to strengthen the coherence in the second year.

The panel regards the lecturers in the programme to be renowned researchers with strong international reputations. The research institutes, they belong to, received scores of very good (4) to excellent (5) in recent research evaluations. The teaching skills of the lecturers are appropriate, as may be seen from the number of BKO-certificates of the course coordinators. The panel considers programme management to be very involved and the lecturers to be committed. Unfortunately, continuity in the lecturers' participation in the programme is not always guaranteed. The panel, therefore, recommends to make long-term arrangements with Faculties and external organizations to ensure prolonged involvement of the lecturers.

In the panel's opinion, the teaching philosophy and teaching methods in the programme as well as the study guidance are conducive to the learning processes of the students. The panel, however, advises to intensify study guidance during the *Research Projects*.

The programme quality is adequately monitored by the Educational Committee on the basis of regular surveys among lecturers and students and by student panel meetings.

The panel regards the examination and assessment rules and regulations for the programme as adequate, ensuring valid examinations and reliable assessments. The examination methods that have been adopted, conform to the course learning goals and are varied, which allows the assessment of different aspects of knowledge and skills. The contents of the examinations of the courses adequately reflect the course learning goals and contents. The panel encourages programme management, however, to complete the process of drafting examination files. This may improve the examinations and assessments. The *Literature Review* and the *Research Projects* are assessed appropriately, as two assessors are involved and assessment forms with relevant criteria are being used. The panel recommends improving the organization and reliability the assessments of the *Research Projects*, by promoting external supervisors to be more senior researchers (at least senior postdocs) and by strengthening the role of the co-assessor. The Board of Examiners has the authority to monitor the contents and the procedures of examinations and assessments but is still in the early stages of the process of verifying the examinations' and assessments' quality. The panel holds a favorable opinion on the steps this Board is taking and would like to encourage this process.

In the panel's opinion, the average grades of the students for the capstone projects *Literature Review* and *Research Projects*, being 8.0 to 8.5, and the percentage of judicia cum laude, being over 25 % on average per year, represent the high level of knowledge and skills the graduates of the programme have achieved. None of the *Research Project* reports, which the panel studied, were rated as unsatisfactory by the panel. Some of these were really excellent, whereas others were satisfactory to good. For some of these reports, the panel would have given a somewhat lower grade than the programme examiners had done. As the number of graduates having been able to enter PhD programmes is substantial, being more than 70 % of the graduates, the panel concludes programme management and lecturers succeed in preparing students very well for PhD programmes.

The panel assesses the programme Research Master Brain and Cognitive Sciences of University of Amsterdam to be good and recommends NVAO to grant re-accreditation to this programme.

Rotterdam, 25 July 2016

Panel chair
Prof. P. Hagoort PhD

Panel secretary
W. Vercouteren MSc, RC

2. Assessment process

Certiked VBI received a request to conduct a limited programme assessment for the re-accreditation of the academic master's programme Research Master Brain and Cognitive Sciences. This request was submitted by University of Amsterdam.

Certiked requested the approval by NVAO of the proposed panel of experts to conduct this assessment. NVAO have given their approval. The panel composition was as follows (for more detailed information please refer to Annex 4: Composition of the assessment panel):

- Prof. P. Hagoort PhD, professor in Cognitive Neuroscience, Radboud University Nijmegen, and director of F.C. Donders Centre for Cognitive Neuroimaging, Nijmegen (panel chair);
- Prof. H.E. Hulshoff Pol PhD, professor of Neuroscience and head Neuroimaging Research Group Utrecht, Utrecht University (panel member);
- Prof. A.J.W. Scheurink PhD, professor in Neuroendocrinology, University of Groningen (panel member);
- R.C.A. Wink MA, student Master programme Neerlandistiek, Leiden University (student member).

On behalf of Certiked, W. Vercouteren MSc, RC was responsible for the process co-ordination and for drafting the panel's report. All panel members and the secretary signed a statement of independence and confidentiality.

The panel conducted this assessment on the basis of the standards of the NVAO Assessment Framework of 19 December 2014 (Staatscourant nr. 36791).

The following procedure was adopted. The panel members of the panel studied the documents presented beforehand by programme management, including a number of theses (please refer to Annex 2 and 3: Documents reviewed and Theses reviewed).

Prior to the site visit, the panel chair and the panel secretary met to discuss the assessment procedures. On 2 June 2016, the entire panel had a meeting to discuss their preliminary findings concerning the quality of the programme. Beforehand, the panel members had drafted a number of questions to be put to the programme representatives during the site visit. During the meeting on 2 June 2016, the findings of the panel members, including those concerning the theses were discussed, and some questions were added. On the basis of this input, the secretary drew up a list of questions, which served as a starting point for the discussions with the programme representatives during the site visit.

On 3 June 2016, the panel conducted a site visit on the University of Amsterdam campus. The site visit schedule was in accordance with the schedule drafted beforehand (please refer to Annex 1: Site visit schedule). Programme management communicated the open office hours to the students and staff of the programme. The information presented by one person has been taken into consideration by the panel.

Having studied the information file presented by programme management, the panel was left with questions on a number of subjects. These subjects were effectively clarified during the site visit.

In a closed session at the end of the site visit, the panel considered their findings and drew conclusions regarding the quality of the programme. At the end of the site visit, the panel chair presented a broad outline of the findings to programme management, lecturers and students.

A draft version of this report was finalised by the secretary, having taken into account the information presented as well as the findings and considerations of the panel. The draft report was sent to the panel members, who studied the draft report and made a number of changes. Thereupon, the secretary drew up the final report. This report was presented to programme management to be corrected for errors. After having been corrected for errors, the report was sent to the institution's Board to accompany their request for re-accreditation of this programme.

3. Overview of the programme

3.1 Basic information about the programme

Administrative information about the programme:

Name programme in CROHO: M Brain and Cognitive Sciences
 Orientation, level programme: Academic Master (Research)
 Grade: MSc
 Number of credits: 120 EC
 Specializations: n.a.
 Location: Amsterdam
 Mode of study: full time
 Registration in CROHO: 60323

Administrative information about the institution:

Name of institution: University of Amsterdam
 Status of institution: Government-funded university
 Institution's quality assurance: Approved

Quantitative data about the programme

Percentage of students who completed the programme in three years (n+1)

Cohort	2010	2011	2012
Percentage of students	69 %	69 %	70 %

Percentage of lecturers with the following qualifications

Qualification	Master	PhD	BKO*
Percentage of lecturers	100 %	90 %	68 %**

*BKO means having obtained Learning and Teaching in Higher Education Certificate

**Course coordinators' figures

The students-to-teacher ratio is 9 to 1. The number of contact hours is 16 hours per week in the first year and 8 hours per week in the second year.

3.2 Main facts about the institution

The degree programme Research Master Brain and Cognitive Sciences is a programme of the Faculty of Science of University of Amsterdam.

University of Amsterdam was founded in 1632. About 30,000 students are enrolled in the programmes of the University and about 5,000 staff are employed by the University. University of Amsterdam is one of the leading research universities in Europe with about 10,000 academic publications by University staff every year.

According to its website, University of Amsterdam aspires to be a broad, research-intensive academic institution, rooted in the history of the city of Amsterdam, an internationally oriented which can compete with leading in the Netherlands and around the world. University of Amsterdam provides academic training in all areas of science and scholarship, and welcomes students and staff, from all backgrounds, cultures and faiths, who wish to devote their talents to the development and transfer of academic knowledge as a rich cultural resource and foundation for sustainable progress.

University of Amsterdam adopted as core values innovation, determination and engagement. In its own words, the University wants to be innovative and take up a position in the vanguard of fundamental research and its applications. For determination, University students and staff are encouraged to carve out their own paths and thus to set new trends. Engagement for the University means to use acquired knowledge and insights to play an ongoing, prominent and visible role in the social debate.

The University of Amsterdam has seven Faculties, being the Faculties of Economics and Business, Humanities, Law, Medicine, Science, Social and Behavioral Sciences and Dentistry.

3.3 Intended learning outcomes

The intended learning outcomes of the programme are as follows. The graduates of the programme are expected to:

- Know central themes in brain and cognitive science research.
- Know important, relevant research paradigms and have a broad knowledge of the methodologies used in brain and cognitive science research.
- Know the ethical aspects of human and animal research as well as the broader implications the research can have.
- Can systematically combine and integrate knowledge, methods and skills from other disciplines, and use them to answer interdisciplinary questions.
- Can formulate important research questions and choose methods that can be successfully used to answer these questions.
- Can formulate a research proposal and effectively respond to a critical evaluation of that proposal.
- Are prepared to adapt their own views and behavior when the situation or progress in the field requires it.
- Can judge the quality of research in the field and help to improve its quality, in both a theoretical and methodological sense.
- Can involve others in the research when additional understanding, expertise or experience is necessary.
- Are aware of the consequences their own actions could have for others who are also involved in the research.
- Can present research results, orally and in writing form, to colleagues and others who are interested.
- Can exchange meaningful ideas with researchers in the field who approach the problem from another perspective.
- Can independently carry out research, within an interdisciplinary context, in the field of brain and cognitive sciences.
- Can plan, carry out and complete research within the limits imposed.
- Can actively collaborate in a network of cognitive science researchers in the broadest sense.
- Are aware of their own limitations as researcher.

3.4 Outline of the curriculum

In the table below, the programme curriculum has been presented.

Courses	Credits
Students from all directions	
Milestones, Promises and Pitfalls	2 EC
Special Topic in Cognitive Science	6 EC
ABC Summer School	4 EC
Research Project 1	26 EC
Behavioral Neuroscience track	
Neuroscience: From Cell to Behavior	5 EC
Experimental Neurobiology	5 EC
Elective courses	6 EC
Specialization courses	6 EC
Cognitive Neuroscience track	Credits
Neurophysiology	5 EC
Brain Organization and Cognition	5 EC
Elective courses	6 EC
Specialization courses	6 EC
Cognitive Science track	
Foundations of Cognitive Science	5 EC
Higher Cognitive Functions	5 EC
Elective courses	6 EC
Specialization courses	6 EC
Total credits first year	60 EC
Literature Thesis	12 EC
Elective courses	6/12 EC
Research Project 2	36 EC/42 EC
Total credits second year	60 EC
Total credits of the programme	120 EC

The specialization courses include: Developmental Neurobiology of the Vertebrate Brain, Foundations of Neural and Cognitive Modelling, Hot Topic in Psycholinguistics and Cognition, Cognitive Models of Language and Music, Multivariate Analysis, Introduction to Neuroscientific Methods and Brain Anatomy, Matlab Programming for Data Analysis, Neuroimaging I, Neuronal Networks in vivo.

4. Overview of assessments

Standard	Assessment
Standard 1. Intended learning outcomes	Satisfactory
Standard 2: Teaching-learning environment	Good
Standard 3: Assessment	Satisfactory
Standard 4: Achieved learning outcomes	Good
Programme	Good

5. Findings, considerations and assessments per standard

5.1 Standard 1: Intended learning outcomes

The intended learning outcomes of the programme have been concretised with regard to contents, level and orientation; they meet international requirements.

Findings

Programme management drafted a concise set of discipline-specific requirements, specifying the scientific domain of the Research Master Brain and Cognitive Sciences programme. In the words of programme management, this domain is aimed at studying the nature and the functions of the human brain and at understanding animal and human cognitive processes from an interdisciplinary perspective, building on the knowledge of disciplines relevant for this domain, like (neuro)biology, psychology, linguistics, logic and philosophy. Combining these disciplines to study the brain and cognitive process will, in the view of programme management, enhance the understanding of these complex phenomena and processes.

The objectives of the programme are to train students to become experts in their field of interest within this domain and, at the same time, to become familiar with the theories and methodologies of the other disciplines. Students are trained to be able to approach subjects in the brain and cognitive sciences domain in an interdisciplinary way and to know how to collaborate effectively with experts from other disciplines. These students will be, so programme management stated, in a good position to study these subjects and to better understand, interpret and address scientific questions in this domain.

The main purpose of this programme is to train students to be able to enter PhD programmes in their field of interest within the brain and cognitive sciences domain. These students not only are trained in their field of study but also they are trained to know how to write research proposals, design experiments, do research, analyze data and present their research results. Although the majority of the students are trained to become researchers, the programme also prepares students for positions in non-academic organizations and in businesses. As will be elaborated under standard 2, these students are offered a specialized minor, preparing them for these positions.

The programme is embedded in the Amsterdam Brain and Cognition Center, this being a center in which seven research institutes from five Faculties of University of Amsterdam participate. In these research institutes, experts on neuroscience, medicine, psychology, linguistics, logic, economics and social sciences study subjects in this domain. In the Amsterdam Brain and Cognitive Center, research is focused on the multidisciplinary and interdisciplinary study of cognitive processes and their relation to human or animal brains and artificial systems.

Programme management has compared this programme to similar programmes in the Netherlands and abroad. There are a substantial number of programmes in this domain. From this comparison, it may be derived this programme shares with many other programmes the multidisciplinary or interdisciplinary approach to the study of this field. Programmes may differ, depending on the research environment they are embedded in.

Programme management drafted a series of intended learning outcomes or final qualifications, specifying knowledge and skills students are to command or have at completion of this programme. The intended learning outcomes have been formulated in relation to the Dublin-descriptors for the master's level.

Considerations

The panel is positive about the objectives of the programme, training students to become experts in their field of interest within the brain and cognitive sciences domain and training them in the theories and methodologies of neighboring disciplines to be able to approach subjects in this domain in an interdisciplinary way. In the view of the panel, the interdisciplinary focus of the programme has been adequately reflected in the programme objectives.

In the panel's opinion, the objectives and intended learning outcomes of the programme reflect graduates' capabilities to enter PhD programmes. This may not only be seen from the disciplinary and interdisciplinary knowledge and skills graduates will have obtained but also from their skills to draft research proposals, do research and present research results. On the other hand, the panel noted graduates may be eligible for positions outside of the scientific community. The panel is positive about programme management offering this possibility to the students.

The panel regards the Amsterdam Brain and Cognitive Center to be the solid basis for the strong research and interdisciplinary focus of the programme. In this institute, researchers from diverse backgrounds come together to study subjects in this domain from an interdisciplinary perspective, thereby determining the research and interdisciplinary profile of this programme.

The intended learning outcomes reflect the programme objectives adequately. The intended learning outcomes address disciplinary knowledge and skills in the field of interest of students, interdisciplinary knowledge and skills, research capabilities, communication skills and learning skills.

As the panel has noted, the programme intended learning outcomes comply with the Dublin-descriptors for the master's level and, therefore, meet the master's requirements.

The panel is of the opinion programme management performed the comparison to other programmes in this domain in the Netherlands and abroad appropriately. The results of this comparison point to a large degree of similarity of this programme to these other programmes.

Assessment of this standard

These considerations have led the assessment panel to assess standard 1, *Intended learning outcomes*, to be satisfactory.

5.2 Standard 2: Teaching-learning environment

The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes.

Findings

The number of students enrolling in the programme is relatively constant over recent years, being around 50 students per year. The percentage of foreign, non-Dutch students is also rather constant over the years, amounting to 30 % to 40 % per year.

Programme management aims at selecting excellent students who are interested in this domain and in the interdisciplinary aspects of it. The criteria for applicants to be admitted to the programme are strong competencies, to be demonstrated by having completed an academic bachelor's programme with a grade point average of 7.5 (Dutch grading system), having studied cognition and/or neuroscience in their previous education, to be demonstrated by courses taken, proficiency in the English language and a clear motivation for this programme, to be illustrated by a motivation letter and two letters of reference.

The number of students admitted, is limited to 60 per year, to be evenly distributed over the three tracks in the programme (see below). For students from abroad, the University of Amsterdam international office checks the criteria mentioned. As a second step in the process, the Board of Examiners of the programme in collaboration with the programme manager verifies whether applicants may be admitted. Applicants are either rejected or accepted. In some cases, the decision is only taken after the programme manager conducted an interview with the applicant.

The admission procedure is quite strict. In 2015, over 150 applications were received and 53 students were admitted. In 2016, more than 200 students applied, whereas only 56 of them were admitted.

For the programme, an exemption policy is in place. The Board of Examiners has the authority to grant exemptions.

Programme management drafted a table in which the relations between the intended learning outcomes and the curriculum components have been specified.

The programme is part of the Institute for Interdisciplinary Studies of University of Amsterdam. This institute is a center for interdisciplinary education within this University, which over the years acquired expertise on specific aspects of this type of education. A number of courses have been specifically designed to foster the interdisciplinary training of students in this domain. These are the first year courses *Milestones*, *Promises and Pitfalls*, *Special Topic in Cognitive Science* and *ABC Summer School*. Interdisciplinary aspects in this domain are also addressed in other courses, the *International Study Trip* and *ABC Lectures* and *ABC Events*.

Students may select one of three tracks, being *Cognitive Science*, *Cognitive Neuroscience* and *Behavioral Neuroscience*. As has been indicated, programme management strives to distribute the students entering the programme evenly over these tracks. Students take the first course, *Milestones*, *Promises and Pitfalls*, which takes a week and then follow their track, being composed of four courses, covering the major part of the first semester of the first year. Students specialize in one of these subdomains, being exposed in these tracks to interdisciplinary aspects as well. Students with whom the panel met, stressed the strong community sense among students in the first year.

The tracks may be regarded to be the starting point of the curriculum. Having completed their track, students are free to choose a number of electives and are also free to select a subject in their field of interest for the *Research Projects*. The first *Research Project*, scheduled in the first year, normally takes place in the Netherlands. In the second year, students spend most of their time on the second *Research Project*. This second project may be done outside of the Netherlands. Programme management stimulates students to address distinct topics or distinct methodologies in the *Research Projects*, although this is not obligatory. In addition, students take the *Literature Review* course in the second year, in which they are to perform a literature study.

As a special feature of the curriculum may be regarded the *ABC Summer School* at the end of the first year, in which students attend lectures by Dutch and foreign scholars, write a research proposal and give poster presentations of their work. Also, students attend the *ABC Lectures Series* of five lectures in this programme and go on an annual study trip to an international research institute.

To students who do not anticipate to enter a PhD programme and subsequently pursue an academic career but who prefer a career in non-academic organizations or businesses, the so-called *Tesla Minor* (30 EC) is offered. This minor prepares students for these types of activities and positions. For students who opt for this minor, the curriculum constitutes 132 EC.

Lecturers in the programme are recruited from seven research institutes of various Faculties, participating in Amsterdam Brain and Cognition Center. The Faculty of Science and the Faculty of Social and Behavioral Sciences contribute most to the programme teaching staff. A substantial percentage of the lecturers, about 40 %, come from outside of University of Amsterdam, notably the Netherlands Institute for Neuroscience and Free University of Amsterdam.

About 60 lecturers participate in the programme. The programme director and the programme manager are key positions in overseeing and organizing the programme. For each of the tracks, track coordinators are responsible for the track organization and coherence. For each of the courses in the curriculum, course coordinators are responsible for the course quality and organization. Course coordinators discuss the course contents with the programme director and programme manager. Lecturers meet one time per year to discuss the programme. Course coordinators meet more often.

The lecturers in the programme are distinguished scholars in their field, as is evident, among other, both from the lists of their principal publications and the substantial number of externally funded research projects. As has been indicated above, researchers of seven research institutes participate in the programme. The SEP-scores of these institutes in recent external research evaluations ranged from 4 (very good) to 5 (excellent).

The lecturers in the programme are either full professors or associate professors, 90 % of them having obtained PhD's. Around 68 % of the course coordinators are in the possession of BKO-certificates. The educational skills of the lecturers are monitored by programme management and the course coordinators. In addition, courses and lecturers are evaluated in regular written student surveys as well as in student panel meetings.

The teaching philosophy for the programme is to create a challenging and inspiring atmosphere for the students and to foster their active participation in class. Teaching and learning are highly interactive.

Teaching methods are, among others, group discussions, individual presentations, project work and writing papers. Students are expected to have prepared for class.

At the beginning of the programme, students meet with the programme study advisor of the programme to draft their individual study plans. These study plans have to be submitted to the Board of Examiners and are updated at the start of the *Research Projects*. The study advisor keeps records of the study progress of every one of the students. Study guidance is offered by the study advisor and the programme manager. In two seminars, students are presented opportunities to do *Research Projects* and are informed about the requirements to start their projects. Programme management offers a research project database with research opportunities for the students. The study advisor also checks study progress in these projects. In addition, a number of academic mentors, being alumni of the programme, guide the students and advise them on study-related topics and career choices. The student success rates of the programme are about 70 % after three years which meet Faculty of Science target figures.

The Educational Committee meets four to five times per year and plays an important role in advising programme management about the quality of the programme. Students inform the panel; programme management takes up suggestions for improvement. As an example, the *Special Topic in Cognitive Science* course has been modified, following students' criticism.

Considerations

The panel considers the admission requirements and the admission procedures of the programme to be very adequate. As the number of students being admitted is limited, the panel concludes programme management to apply the admission requirements in a strict sense, permitting only the very talented and motivated students to enroll. The panel advises programme management to install an admission committee and not to involve the Board of Examiners in this process, since this is not a task for this Board.

The panel considers the curriculum to be an appropriate reflection of the intended learning outcomes of the programme, comprising theoretical and methodological knowledge and skills as well as academic and research skills, which are to be expected on the basis of the intended learning outcomes. The *Research Projects* and *Literature Review* make the research component in the curriculum substantial. The contents of the courses are very adequate. A satisfactory number of electives are offered.

For the panel, a number of features make the curriculum stand out. The interdisciplinary profile of the programme is reflected very adequately in the curriculum, as may be seen from courses, especially meant to address interdisciplinarity and other courses, touching upon this aspect. In addition, the panel welcomes the track structure of the curriculum, as this allows students to work in small groups in their field of interest, offering them a solid basis in the brain and cognitive science domain. In the remainder of the curriculum, students are free to choose their own field of interest, which may even be different from their track. Also, the panel is very positive about the *Tesla Minor*, giving students who do not aspire careers in academia the opportunity to prepare for positions in businesses or non-academic organizations.

The coherence of the curriculum is satisfactory in the first year but is somewhat lacking in the second year. Therefore, the panel recommends to strengthen this in this year, for instance by organizing meetings in which students present their results from research.

In the panel's view, lecturers in the programme are renowned researchers with strong international reputations as scholars in their fields. The research institutes, most lecturers belong to in their capacities as researchers, received scores of very good (4) to excellent (5) in recent research evaluations. The panel regards the teaching skills of the lecturers to be appropriate, as may be deduced from the number of BKO-certificates, obtained by the course coordinators. The panel would like to emphasize having met a very strongly involved programme management as well as committed lecturers, both of which are an asset to the programme. On the other hand, the panel learnt continuity in the lecturers' participation in the programme is not always guaranteed, dependent as this on Faculties' policies. The panel recommends to make long-term arrangements with Faculties and external organizations to ensure prolonged involvement of the lecturers.

The panel regards teaching philosophy and teaching methods in the programme to be conducive to the learning processes of the students. Also, study guidance is up to standard. Students may ask the study advisor but may turn to programme management as well. The panel, however, advises to intensify study guidance during the *Research Projects*, to further raise the student success rates.

The panel considers the quality assurance of the programme to be adequate. The programme quality is monitored by regular surveys among lecturers and students and by student panel meetings. The position and the role of the Educational Committee in this respect are evident.

Assessment of this standard

These considerations have led the assessment panel to assess standard 2, *Teaching-learning environment*, to be good.

5.3 Standard 3: Assessment

The programme has an adequate assessment system in place.

Findings

For the programme, an Assessment Plan has been drafted. In this plan, the responsibilities with regard to examinations and assessments have been listed and procedures for drafting and assessing examinations have been detailed. General rules and regulations pertaining to examinations and assessments have been laid out in the programme Education and Examination Regulations.

Programme management specified examination methods for each of the courses, being, among others, written examinations, presentations, practicals, problem-solving exercises, research proposals, take-home assignments, group research and team papers. The examination methods in the interdisciplinary courses are specifically adapted to this type of course.

The course coordinators discuss the examination and assessment features of the courses with programme management. Although examinations in each of the courses are drafted in line with the course learning goals, programme management and course coordinators are in the process of designing examination files, which specify the relations between the programme learning outcomes, the learning goals of the courses and the contents of the examinations.

For the programme, a Board of Examiners has been installed. This Board's responsibilities are to monitor the quality and the level of the examinations in the programme, including examinations of the *Literature Review* and the *Research Projects*. Also, the Board appoints the examiners. In addition, the Board of Examiners is responsible for monitoring the examinations and assessments procedures. Although the Assessment Plan is in place, the quality checks by the Board are in the early stages. Examination files have been studied in a pilot setting. Within the upcoming years, the Board of Examiners will conduct quality checks on samples of examinations. Each course will be evaluated by the Board at least every three years.

The *Literature Review* is an individual assignment, to be assessed by two examiners who make use of assessment forms with explicit criteria. Both *Research Projects* are individual assignments as well. The proposal for the project is to be approved by the review committee, which acts on behalf of the Board of Examiners. The *Research Projects* are evaluated at mid-term by the external supervisor of the student and at completion by the external supervisor and by the programme co-assessor. They use a standardized form. The grade is calculated as a weighted average of experimental work (40 % of the grade), presentation (10 %) and the research report (50 %). The co-assessor is only involved in the assessment of the report, but should also participate in the evaluation of the presentation, to be given at University of Amsterdam. As a third person involved, the UvA representative oversees the process and intervenes in case of differences of opinion between the two examiners. It may be the co-assessor and the UvA representative are one and the same person. In some instances, so the panel noted, external supervisors had not obtained PhD's.

Considerations

The panel regards the examination and assessment rules and regulations, exemplified by the programme Assessment Plan and the Education and Examination Regulations, to be appropriate and to ensure valid examinations and reliable assessments.

The examination methods that have been adopted in the programme, conform to the course contents and learning goals and are varied. The panel considers this to be positive, since it allows the assessment of different aspects of knowledge and skills.

The panel studied the examinations of the courses and the assessments of these examinations and found these to adequately reflect the course learning goals and course contents. The panel would, however, encourage programme management to complete the current process of drafting examination files, since these will allow to improve the examinations and assessments further.

The panel observed the Board of Examiners being in the early stages of the process to verify the quality of examinations and assessments by performing regular quality checks on samples of examinations. The panel has, however, a favorable opinion about the steps the Board of Examiners is taking and would like to encourage this process.

In the panel's view, the *Literature Review* as well as the *Research Projects* are assessed appropriately, as two assessors are involved and assessment forms with relevant criteria are being used. The panel recommends to further improve the organization and reliability the assessments of the *Research Projects*, by promoting external supervisors to be more senior researchers and by strengthening the role of the co-assessor.

Assessment of this standard

The considerations have led the assessment panel to assess standard 3, *Assessment*, to be satisfactory.

5.4 Standard 4: Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

Findings

The average grades students are given for the capstones of the programme *Literature Review* and the *Research Projects* are about 8.0 to 8.5 (on the Dutch 1-10 scale).

The percentages of graduates with the cum laude judicium vary between 21.4 % to 33.3 % for the last four years (2010 – 2013). On average, for these years this percentage has been 25.5 %.

In January 2016, programme management set out a survey among graduates, 79 of whom responded to the survey questions. The survey showed more than 70 % of these graduates to have entered PhD programmes in the Netherlands and abroad and 70 % of these graduates to have pursued careers in research.

Considerations

In the panel's opinion, the average grades of the students for the capstone projects *Literature Review* and *Research Projects* testify to the high level of knowledge and skills the graduates of the programme have achieved. The percentage of judicia cum laude of more than 25 % over the past four years is an indication of the level the graduates reached as well.

The panel studied a sample of *Research Project* reports by graduates of the last two years. None of these reports have been rated to be unsatisfactory by the panel. Some of these were really excellent, whereas others were satisfactory to good. For some of these reports, the panel would have given a somewhat lower grade than the programme examiners had done.

The panel considers the number of graduates having been able to enter PhD programmes to be substantial and concludes, therefore, programme management and lecturers succeed in preparing students very well for PhD programmes and, subsequently, for careers in academia.

Assessment of this standard

The considerations have led the assessment panel to assess standard 4, *Achieved learning outcomes*, to be good.

6. Recommendations

In this report, a number of recommendations have been listed. For the sake of clarity, these are brought together below. The recommendations are the following.

- To install an admission committee and not to involve the Board of Examiners in the admission process, since this is not a task for this Board.
- To strengthen the coherence of the curriculum in the second year of the programme.
- To ensure lecturers' prolonged involvement in the programme, by making long-term arrangements with the Faculties and external organizations the lecturers are employed by.
- To intensify study guidance during the *Research Projects*, to raise the student success rates above the Faculty of Science target figures.
- To continue and complete the current process of drafting examination files, since these will allow to improve the examinations and assessments further.
- To continue the process of regular quality checks on samples of examinations by the Board of Examiners.
- To improve the organization and reliability of the *Research Projects* assessments, by promoting external supervisors to have a PhD and by strengthening the role of the programme co-assessor.

Annex 1: Site visit schedule

The site visit took place in Amsterdam on 3 June 2016. The site visit schedule was as follows.

- | | |
|---------------------|---|
| 08.30 h. – 09.30 h. | Arrival and deliberations panel (closed session) |
| 09.30 h. – 10.00 h. | Dean and programme management
Prof. P.H. van Tienderen PhD (Dean ad interim Faculty of Science), L.U. Wenting MSc (director Institute for Interdisciplinary Studies), H.J. Krugers PhD (programme director) |
| 10.00 h. – 11.20 h. | Programme management and core lecturers
S.M. van Beekum MSc (programme manager), prof. H.J. Honing PhD (coordinator elective course Music Cognition), C.A. Bosman Vittini PhD (coordinator Literature Review), G. Post MSc (junior lecturer Special Topic in Cognitive Science course), R. Rouw PhD (coordinator Cognitive Neuroscience track), I. Visser PhD (coordinator Foundations of Cognitive Science course) |
| 11.30 h. – 12.15 h. | Board of Examiners
Prof. M.W. van der Molen PhD (chair Board of Examiners), C.S. Lansink PhD (member Board of Examiners), J.E. Rispens PhD (member Board of Examiners), E.M. Algera MSc (test coordinator), |
| 12.15 h. – 13.30 h. | Lunch panel (closed session), open office hours 12.15 h. – 12.45 h. |
| 13.30 h. – 14.30 h. | Lecturers and theses' examiners
L. van Maanen PhD (course coordinator Foundations of Cognitive Science), J.C. Francken PhD (junior lecturer Special Topic in Cognitive Science course), H. Kessels PhD (supervisor), J.K. Szymanik PhD (course coordinator Higher Cognitive Functions), prof. B.U. Forstmann PhD (course coordinator Introduction to Neuroscientific Methods and Brain Anatomy), M.C. Keuken PhD (lecturer course Introduction to Neuroscientific Methods and Brain Anatomy) |
| 14.30 h. – 15.30 h. | Students, including members of Educational Committee
U. Bernardič (first year student, member Educational Committee member), A. Voppel (first year student, member Educational Committee), E. Visser (second year student), S. Miletić (second year student), B. Bucker MSc (alumnus), K. Seignette (aumnus) |
| 15.30 h. – 17.15 h. | Deliberations panel (closed session) |
| 17.15 h. – 17.45 h. | Main findings presented by panel chair to programme management and others involved |

Annex 2: Documents reviewed

The panel studied the following documents, presented prior to the site visit:

- Self-evaluation report Research Master Brain and Cognitive Sciences
- Members of Boards and Committees
- Flow Diagram
- Overview of Teaching Staff and Academic Support
- Teaching Philosophy
- Electives
- Internships
- Minutes Round Table, April 2015
- Teaching and Examination Regulations
- Research Project Agreement Form
- Supervisor Manual
- Research Project Grading Form
- Alumni Survey 2016
- Grants
- Literature Thesis Grading Form
- International Research Projects
- Interdisciplinary Research Assignment
- ABC Themes and Principal Investigators
- ABC Grants, 2014 – 2015
- NSE Results, 2014, 2015
- Assessment Plan

On the day of the site visit, programme management presented the following documents:

- Literature Theses (selection)
- Lists of students' and alumni grades
- Research Evaluation Reports
- Course material (selection)
- Annual Reports and Minutes Board of Examiners
- Annual Reports and Minutes Educational Committee
- List of Examiners
- Examinations (selection)
- Programme Evaluation Report, 2010
- Amsterdam Brain and Cognitive Journal
- Documentation Study Association
- Brochure Master Brain and Cognitive 10th Anniversary

Annex 3: Theses reviewed

The theses of the following 15 students have been selected for review by the panel

- 10103957
- 10597735
- 10551395
- 10437312
- 6175937
- 10669167
- 10661514
- 10633294
- 10436987
- 10420401
- 10629661
- 6059333
- 5929105
- 10458581
- 10529462

Annex 4: Composition of the assessment panel

The assessment panel had the following composition:

- Prof. P. Hagoort PhD, professor in Cognitive Neuroscience, Radboud University Nijmegen, and director of F.C. Donders Centre for Cognitive Neuroimaging, Nijmegen (panel chair);
- Prof. H.E. Hulshoff Pol PhD, professor of Neuroscience and head Neuroimaging Research Group Utrecht, Utrecht University (panel member);
- Prof. A.J.W. Scheurink PhD, professor in Neuroendocrinology, University of Groningen (panel member);
- R.C.A. Wink MA, student Master programme Neerlandistiek, Leiden University (student member).

Prof. P. Hagoort PhD, panel chair

Mr. Hagoort is a full professor in Cognitive Neuroscience, Radboud University Nijmegen, and the director of F.C. Donders Centre for Cognitive Neuroimaging, Nijmegen. In addition, he is the director of Max Planck Institute for Psycholinguistics in Nijmegen and a guest professor in Cognitive Neuroscience at University of Zagreb. Mr. Hagoort is a member of Royal Netherlands Academy of Arts and Sciences and was awarded the Spinoza Premium for his scientific work in 2005.

Prof. H.E. Hulshoff Pol PhD, panel member

Mrs. Hulshoff Pol is a full professor in Neuroscience at Utrecht University and the head of Neuroimaging Research Group Utrecht at University Utrecht. Among other, she held positions as a research assistant, an assistant professor and an associate professor in the Netherlands and in the United States. She supervised many graduate students and PhD students. Mrs. Hulshoff Pol has been awarded a number of research grants and has published extensively in her field of study.

Prof. A.J.W. Scheurink PhD, panel member

Mr. Scheurink is a full professor in Neuroendocrinology at University of Groningen. He was, among others, a research fellow of Royal Netherlands Academy of Arts and Sciences. His main research interests are the role of the central nervous system in the regulation of energy balance and the etiology of eating disorders. Mr. Scheurink is chair of the Board of Examiners for Biology and Life Sciences & Technology at University of Groningen and was elected teacher of the year of the University of Groningen in 2014.

R.C.A. Wink MA, student member

Mr. Wink is studying in the Master programme Neerlandistiek of Leiden University. Previously, he completed the Research Master History of this University. He was a member of the education committee of this programme. Mr. Wink was, among other, employed as a junior marketing analyst and an account manager. He has been a student member in a number of assessment panels.