



**Development of research council
work – Working group report for
discussion on reviewing the work of
Academy of Finland's research councils**



ACADEMY OF FINLAND

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Contents

1. Introduction.....	2
2. Changes in the operating environment and the Academy in 1995–2016	3
3. Task description for council member and chair – current situation	5
4. Experiences and development needs	7
5. Conclusions and procedure proposals	13
Appendices	20
<i>Appendix 1. Extract from Government Decree on the Academy of Finland, Academy’s Rules of Procedure...</i>	<i>20</i>
<i>Appendix 2. Description of current research council nomination process</i>	<i>22</i>
<i>Appendix 3. Tasks of a council member – situation in 2016</i>	<i>23</i>
<i>Appendix 4. Practices of international research funding organisations</i>	<i>29</i>
<i>Appendix 5. Academy of Finland organisation 1948–2015.....</i>	<i>35</i>
<i>Appendix 6. Funding opportunities of the Academy of Finland 1995–2015</i>	<i>36</i>
<i>Appendix 7. Academy of Finland’s Academy Project funding in 1995–2015</i>	<i>39</i>

Abstract

The implementation plan of the Academy of Finland’s strategy states that the renewal requirements of the structure of the Academy’s research councils will be examined. The objective of this report prepared by the Academy’s Administration Office is to describe the changes that have taken place over the past 20 years and the situation of the research councils’ work and thus to offer a foundation for further discussions for developing the Academy’s research councils’ work.

The material used for this report consists of the Administration Office’s statistics and data, outputs from an employee workshop, focus discussions with previous and current research council members and other discussions with key stakeholders, and observations of the practices of similar foreign organisations.

The report describes changes and activities in the research environment, research councils and the Academy of Finland over the past 20 years. It also highlights observations and any development items that have been identified. The report outlines various procedure proposals and possible models for revising the research council structure. The purpose of the proposals is to provide the Ministry of Education, Science and Culture with material for discussions on reviewing the appointment process of the Academy’s research councils and any regulations concerning the Academy. The Academy’s Administration Office can also use the report to review the development of operational methods related to the research councils’ work.

1. Introduction

The implementation plan of the Academy's new strategy (2015) outlines that the research council structure and the operation of the research councils will be reviewed during the period 2016–2018. There have not been any major changes in the operation and tasks of the research councils since 1995 when the current four research councils started operation. On the other hand, the practical council work has changed and evolved in many ways. The application review process has been developed continuously, decision-making criteria have become more versatile, and at the same time, science has been renewed and research methods have changed.

Consideration should be given to how the roles of the research councils and their members have changed during this period. How should these roles be developed so that we will continue to have committed, high-quality representatives of research in this important position of trust? A working group appointed by the Administration Office was asked to prepare this report on the current status of the research councils' work, on the roles of the various actors involved and on proposals for developing the research councils' operations. The report also contains task descriptions for research council members that can be used when recruiting new members.

Material for the report was compiled through interviews and discussions with various stakeholders. Participants included current and former research council members, the Board of the Academy, representatives of universities and research institutes, officials of the Ministry of Education, Science and Culture, foundations that grant research funding, the Finnish Union of University Professors and the Finnish Union of University Researchers and Teachers. The workshop organised for the Academy's Administration Office used the long experience of the Academy's experts in council work and their knowledge that has accumulated over the years as a basis for the report. In addition, the report contains information on practices used by foreign research funding organisations in particular in situations corresponding to research council work.

In keeping with the assignment given to the working group, the report outlines the development that has taken place in the research councils' work over the past 20 years, tasks related to the research councils' work and the tasks of an individual council member. Important points of view include the quality and efficiency of the Academy's operations and the attractiveness of council work. Development items have been identified on the basis of the review and they are used for drafting models for developing the research councils' work and possibly also their structure. The report does not produce a single, complete solution proposal but reviews possible alternatives on the basis of which the Board of the Academy, the Administration Office and the Ministry of Education, Science and Culture can proceed to concrete procedures.

The report has been prepared by a working group appointed by the Academy's Administration Office supported by a steering group. The Academy's management team has also commented on the report. Riitta Maijala, Vice President for Research, chaired the steering group whose members included directors Susan Linko (Natural Sciences and Engineering Research Unit), Laura Raaska (Biosciences and Environment Research Unit), Liisa Savunen (Culture and Society Research Unit) and Jarmo Wahlfors (Health Research Unit), Director Arja Kallio (Academy Programme Unit), Director of Communications Riitta Tirronen, Vice President for Administration Ossi Malmberg, and directors Jussi Vauhkonen (Strategic Research Unit) and Pentti Pulkkinen (Planning and Management Support Unit). The composition of the working group was as follows: Pentti Pulkkinen (chair), representatives of council units Jaana Lehtimäki and Kata-Riina Valosaari (Biosciences and Environment), Hannele Kurki (expert secretary) and Minna Söderqvist (Culture and Society), Anna Kalliomäki and Juha Latikka (Natural Sciences and Engineering), Sara Illman and Aki Salo (Health), Jaana Roos (Academy Programme Unit), Tiina Jokela (Strategic Research Unit), Legal Adviser Katja Majamaa and Project Officer Henriikka Katila.

After a review of the operating environment in Chapter 2, Chapter 3 presents the current task description of a research council member. Chapter 4 presents the points of view and observations based on interviews and discussions and some international examples for comparison. Chapter 5 contains development items that have

been identified and procedure proposals. A SWOT analysis has been prepared on alternative models. The appendices contain detailed material that is central for the process.

2. Changes in the operating environment and the Academy in 1995–2016

The Academy of Finland is a central body in research administration within the administrative branch of the Ministry of Education, Science and Culture. The Academy holds a central and established position in the research and innovation system in Finland, in funding science and research and as an expert in science policy. The Academy's structure is unique within Finland's state administration, as on one hand it is part of the state administration, and on the other, the Academy's bodies consist of members of the research community who operate in a position of trust as decision-makers.

2.1 Developments in the research landscape

The funding of research and development operations grew throughout the 1990s in Finland. Even though the growth resulted mainly from increased R&D investments of companies, public investment in R&D also increased; a major investment was channelled to research in particular from the sale of state-owned companies during the latter half of the 1990s. Now, by the middle of the 2010s, R&D expenditure has decreased but Finland is still an R&D-intensive country. In real terms, the Finnish Government's R&D spending has increased throughout the 2000s and state funding for universities has increased from 2001 to 2015. The real growth of the Academy of Finland's resources has been favourable. The importance of public funding has increased in particular as companies' R&D operation budgets have decreased during the first half of the 2010s.

In 2005, the Government resolution on the structural development of the public research system set new obligations for universities to identify their own areas of expertise, develop their mutual distribution of work and renew their structures and operating methods. According to the resolution, this would be best achieved by investing more in competitive research funding.

The way science is conducted has changed: the online availability of materials, multidisciplinary, a problem-based approach and various cooperation networks are emphasised in almost all scientific work. Open science and the availability of public information also set new requirements for the methods of research. While the need for research is emphasised in society, a closer commitment is required to the high quality and impact of research and to ensuring that the research being carried out is responsible and ethically sustainable.

2.2 Research council structure

The operational structure of the Academy of Finland has remained more or less the same ever since the Academy was established in its new form in 1970 (Appendix 5, Academy of Finland organisation 1948–2015). The first international assessment on the Academy commissioned by the then Ministry of Education was completed in 1993 and it sped up the reorganisation of the Academy. Originally, the research council structure of the Academy was based on the educational structure of a university. A key change in the decree on the Academy that entered into force in 1995 was the reduction in the number of research councils from seven to four, and the reduction in the number of research council members from 15 to 11. There was also a change in the role of the members: they were no longer trustees of their own university, research institute or discipline; instead, they were experts on scientific research on a wide scale.

The next amendment to legislation concerning the Academy entered into force in 2010. The amendment was made to change the composition of the Board of the Academy and the Academy's research post system in such a way that Academy Professor and Academy Research Fellow posts were changed into conventional employment relationships. From 1995 to 2009, the Board of the Academy consisted of the chairs of the four research councils and two representatives appointed by the Government. As of 2010, the Board consists of a

chair appointed by the Government and at least five, and at most seven other members. The amendment of the decree on the Academy issued in 2014 specified the composition and tasks of the Board of the Academy. Board members and the chair are currently outside the Academy organisation but the chairs of the research councils have the right to be present and heard at Board meetings. In 2014, a regulation was adopted concerning the Strategic Research Council and the Finnish Research Infrastructure Committee to be established in connection with the Academy, whose chairs are entitled to be present and heard at Board meetings. Currently, the Board of the Academy has a more extensive science policy-related role and it aims to adopt a more strategic approach.

A key change in the operation of the Academy of Finland has been the introduction of the above-mentioned new preparatory and decision-making bodies alongside research councils. Currently, the position of the general unit appointed by the Board of the Academy is more important than before as it makes decisions on, among other things, the profiling funding of universities, centres of expertise and Academy professors.

2.3 Operating methods and research funding process

All international reviews of the Academy of Finland's operations (1993, 2004 and 2013) have paid attention to the several funding forms and related processes of the Academy and presented that they should be checked, rationalised and reduced. The Board of the Academy decided on the overall renewal of funding forms in 2006 and 2010 as an attempt to make the science policy objectives of funding forms clearer from the perspective of researchers, reviewers and decision-makers in research councils. The renewals aimed also to improve the functionality and scheduling of funding forms (Appendix 6, Funding opportunities of the Academy of Finland 1995–2016). In 2006, electronic documents were adopted by the Academy for processing research funding applications, expert reviews and reports. The objective was to strengthen the Academy's operation with regard to its core duty, research funding. As of 2010, the Academy has had two main funding calls, first in January and October, and later on in September and April. As of the 2010 calls, the Academy has applied a so-called full cost model in nearly all of its funding. The central idea behind the strategy adopted in 2015 is that the Academy strengthens the quality and impact of Finnish research and renews science and research environments with its research funding and expertise. The funding schemes of Postdoctoral Researcher and Academy Research Fellow, the Centre of Excellence programme and Academy Programmes have been renewed according to the ideas laid down in the strategy.

In 1995, the Academy of Finland's budget was about FIM 459 million; roughly equal to EUR 77 million. In 1995, the Academy received 1,868 research funding applications and 1,101 applications for a research post; in addition, there were nearly 2,500 other funding applications. Thus, the total number of applications was around 5,395. Research projects varied to a great extent according to their size, ranging from minor projects to projects that were funded for a year or two, or even three years, that mainly funded postgraduate students. During the funding form renewals in 2006 and 2010, project funding was directed more specifically to funding following a doctoral dissertation, and the duration of projects was extended to four years, thereby increasing the project size. In addition, the project size has been increased by the adoption of the full cost model and also by the fact that project funding is currently primarily intended for groups that consist of researchers with a doctoral degree (Appendix 7. Academy of Finland's funding for Academy Projects in 1995–2015). In 2015, the Academy's budget authority was EUR 405.1 million, which also contained non-recurring funding (such as key project funding and strengthening university research profiles with competitive funding). In the September 2015 call, the Academy received 3,381 applications (Academy Projects 1,280, Academy Professors 145, Academy Research Fellows 623, Postdoctoral Researchers 1,099 and more than 200 other applications).

For the most part, considerable changes have been made to the review of the Academy's research funding applications. Before 1995, the review of applications was mainly based on work carried out by research council members. These professor-level persons, a total of about 105, formed a continuously available pool of experts of the Academy of Finland that both reviewed applications in writing and made final decisions on them within their own fields of expertise. The high number of applications and large workload for research council members

were among the reasons for carrying out the research council and expert renewal. Since 1995, the review of applications has been based more and more on work carried out by a review panel consisting of experts in various fields instead of individual persons issuing statements. Annually, 1,000 experts – nearly 95% of whom are international experts – review applications submitted to the Academy.

3. Task description for council member and chair – current situation

The tasks of a research council are described in the Academy’s Rules of Procedure. The tasks of a council member are not mentioned separately in the rules or in any other guiding documents. A research council uses the Academy’s authority in its field of expertise and makes decisions as a college. Research council members represent the whole research community in Finland. Each member participates in decision-making, thus providing their own expertise. Orientation of members to the Academy’s operations takes place after their appointment, at the beginning of their term.

The tasks of a research council can be divided into research funding and other science policy-related activity. The most visible and time-consuming task of a research council is to distribute research funding. The Board of the Academy decides the general principles of granting funding, the application review principles and the available funding opportunities. The Board also allocates the research funding available to research councils and units each year. The Administration Office of the Academy publishes a call for applications in which the available funding and its forms are described. Figure 1 presents the current situation of the research funding process and the roles of various operators involved in the process.

The tasks of a council member are described in more detail in Appendix 3. Below is a short summary of the tasks.

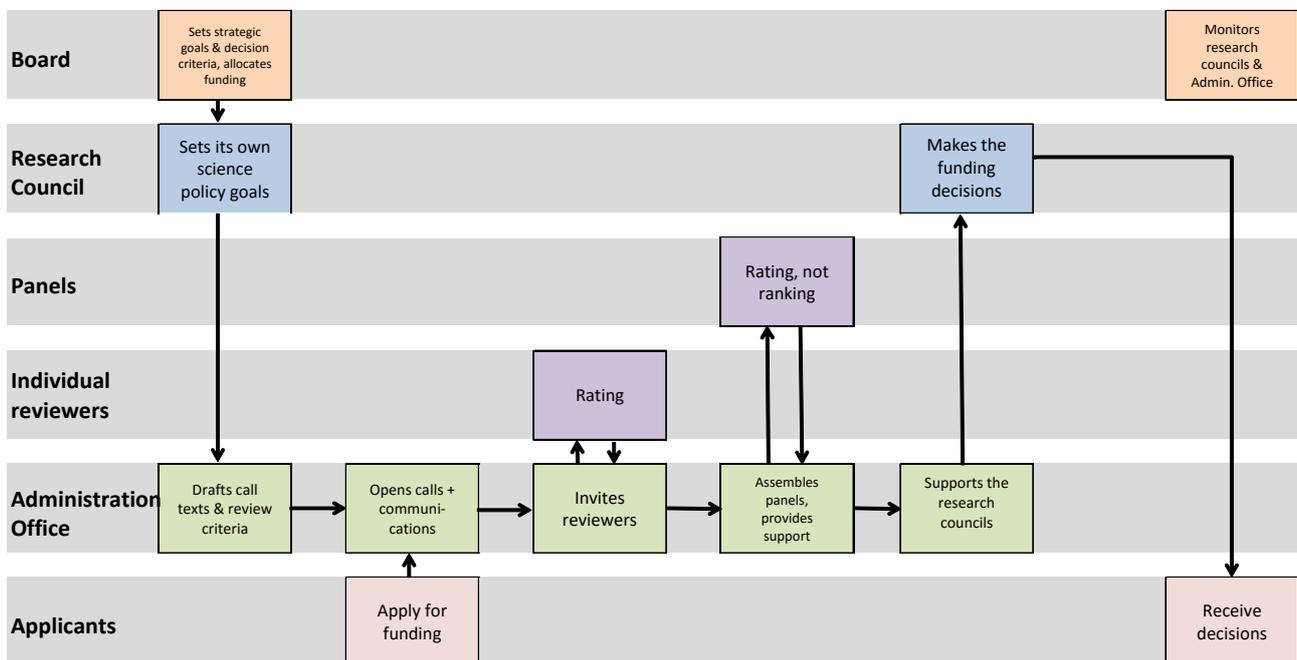


Figure 1. Current model for the Academy of Finland’s research funding

3.1 Tasks of a council member – processing research funding applications

The funding schemes that the research councils process and decide upon include Academy Project funding, targeted Academy Project funding, Academy Research Fellow and Postdoctoral Researcher grants and other special funding and research cost grants to Academy Professors. Before a call is opened, the research councils

decide on any special principles that are specific to funding schemes and agree the criteria for funding decisions. Research council members can disseminate information on Academy calls in their own organisations and otherwise distribute information on current news related to the Academy.

Once a call has closed, members report those applicants with regard to whom they are disqualified. They will not in any way participate in the processing of the applications in question and will be disqualified for the entire application in question.

The Academy's Administration Office coordinates the scientific review of applications as a result of which reviews are produced on the applications. Research council members familiarise themselves with the applications that have been assigned to them and with the review reports on the applications. The research councils meet in various compositions during the preparation phase before decisions are made. Presenting officials at the Academy prepare decision proposals on the basis of the meetings that are used by the research councils when making decisions. The chair of a research council, or if they are not available one of the vice chairs, heads the council's meeting. In spring 2017, for the first time, the research councils will prepare short justifications for their decisions.

The research councils monitor the research projects that have received funding with the help of research reports submitted following the conclusion of the projects. While the projects are ongoing, research councils arrange researcher meetings and workshops during which the funded researchers present their work.

Research councils also participate in the application processing of the other funding opportunities of the Academy either as colleges or individual members. Research council members act in the steering groups of Academy Programmes that outline the content of the programmes and decide on projects to be funded as members of the programme subcommittee. Research councils familiarise themselves with Academy Professor applications as colleges as well as with the review reports on the applications, and make suggestions for the Academy's General Subcommittee on applications to be funded. Research council members have an important role in processing applications for the Centre of Excellence programme and preparing decision proposals for the General Subcommittee. A research council representative acts as a member of the Finnish Research Infrastructure Committee at the Academy and participates in the decision-making on applications in the same way as in a research council. The chair of a research council is a member of the Academy's General Subcommittee.

3.2 Other tasks related to science policy

Each year, a research council will prepare planning documents for the upcoming term during which the most important funding schemes are prioritised in terms of the research council's field of expertise and the decision-making principles are agreed. Also, the future need for funding is estimated for the funding schemes under the research council's authority, including co-funded international calls. The chair of the research council will hold annual agreement negotiations between the research council and the Academy's management with the head of the corresponding research unit.

Research council members participate in steering groups of international research programmes and in cooperation groups of funding organisations. The members may also represent the Academy in international organisations and research infrastructures.

Chairs of research councils participate in the activities of the Board of the Academy based on the right to be present at Board meetings. They also participate in the operation of the Academy's Research Management Group. The chair of a research council uses the council's authority when deciding on changes related to funding applications.

All research council members also participate in science policy discussions outside the Academy.

3.3 Figures and schedules

A research council holds around eight decision meetings per year and as many preparatory and planning meetings. The period with the greatest workload falls on early spring when decisions on Academy Project funding and funding for research posts as Academy Research Fellow and Postdoctoral Researcher are prepared. Table 1 presents the number of applications for these funding schemes over the past three years. Appendix 3 includes an example schedule for a research council meeting.

	2014				2015				2016			
	PR	ARF	AP	TOTAL	PR	ARF	AP	TOTAL	PR	ARF	AP	TOTAL
RCBE	157	87	222	466	165	120	233	518	172	117	257	546
RCCS	339	151	370	860	349	153	392	894	353	176	478	1,007
RCNSE	387	229	510	1,126	399	229	509	1,137	394	233	534	1,161
RCH	130	94	242	466	152	87	205	444	162	89	237	488
TOTAL	1,013	561	1,344	2,918	1,065	589	1,339	2,993	1,081	615	1,506	3,202

Table 1. Applications addressed to the Academy's research councils 2014–2016 for the funding schemes of Postdoctoral Researcher (PR), Academy Research Fellow (ARF) and Academy Projects (AP). Source: Academy's WebFocus system.

4. Experiences and development needs

This chapter contains a summary of the discussion with officials of the Ministry of Education, Science and Culture and feedback from interviews with research council members, personnel workshops and other events. Identified points of view are presented here as observations. Conclusions presented at the end of each section will be used later on in Chapter 5.

When the work of Academy research councils is being developed, it is important that key objectives deemed suitable for the Academy's operations are maintained. These include the following:

- The Academy is trusted by the research community and other actors.
- The review of applications is carried out and the funding decisions are made in a high-quality and efficient manner.
- The workload for applying for research funding is reasonable for an applicant and the process provides them with useful feedback.
- The Academy is a forerunner in developing research funding schemes and processes.
- The principles of good administration are followed in all Academy operations.

4.1 The Academy of Finland is trusted

The Academy of Finland grants funding for scientific research. Based on various studies, such as the international assessment of the Academy (2013)¹, an interest group survey in 2016² and a recent Finnish Science Barometer (2016)³, the Academy and its research council system founded on persons in a position of trust enjoy the trust of the Finnish researcher community. Based on interviews with research council members, the Academy is a

¹ Erik Arnold, Terttu Luukkonen, Patries Boekholt, Anke Nooijen, Zsuzsa Jávorka, Frank Zuijdam, *Evaluation of the Academy of Finland*, Reports of the Ministry of Education and Culture, Finland 2013:14.

² Academy of Finland, interest group survey 2016; Taloustutkimus Oy.

³ The Finnish Science Barometer: A study of Finns' attitudes towards science and their opinions on scientific and technological progress; Tieteen tiedotus association 2016.

reliable organisation but the work carried out by research councils is not very well known within the researcher community.

The role and operation of the Academy of Finland has been assessed three times over the past 20 years in international assessments commissioned by the Ministry of Education, Science and Culture. The Academy's basic operations have always been considered to be high-quality, current and cost-efficient. Key proposals of the assessments have been implemented in developing the Academy's operations.

Conclusion: The Academy's research council structure is trusted and its operation has been found to be good.

4.2 Research funding is the research council's main task

The Academy's research funding is always subject to competition. All applications are subjected to an international scientific review that highlights the best ideas and new scientific openings. The Academy's research funding improves, for its part, the level and impact of research in Finland. The research councils distribute a significant share of the Academy's research funds; in 2015, the research councils made funding decisions worth a total of around EUR 200 million, that is, about half of the Academy's entire funding budget (EUR 405 million), which covers about 20 per cent of the research funding of universities in Finland and a notable share of other Finnish research organisations. The proportion of funding decisions made by research councils of the entire funding distributed by the Academy has reduced in recent years due to the introduction of new funding schemes, such as the strategic research funding instrument and the funding to strengthen university research profiles.

The research councils make decisions as colleges on Academy Project funding, on funding for research posts as Academy Research Fellow and Postdoctoral Researcher and on the research councils' own specific funding schemes. In addition, research council members play an important part in decision-making concerning research projects selected to Academy Programmes and the Centre of Excellence programme.

Conclusion: Through competitive funding, research councils have a notable opportunity to improve the scientific level of research carried out in Finland.

4.3 Research councils are attractive to high-quality representatives of the research community

Based on interviews with research council members, the appointment process of research councils may appear non-transparent. The preparation process in 2015 is described in Appendix 2. The request from the Ministry of Education, Science and Culture on the nomination of candidates for the Academy's research councils is quite general and it could contain a more specific description of the task in question. During the interviews, members said that they had received a request to run for an appointment from a national committee of their discipline or the management of their own organisation, for example. In that connection, there was no knowledge of the probability of being appointed. In many cases, news of the appointment was received after several months of silence.

It became clearly evident during the interviews that the members must be top-level, active researchers for the success of the research council work and that they are provided with an interesting, useful and sensible set of tasks in terms of workload. This should be described already at the nomination phase along with any previous experience sought from the members. A research council member's own possibilities to apply for research funding from the Academy in connection with the appointment process should also be made clear. Sufficient transparency in the process is important for the reliability and regard of the research council system. When this is described in sufficient detail and also attractively, research councils will obtain a sufficient number of candidates in order to achieve a balanced composition also in the future.

According to discussions held with the Ministry, the appointment process will be revised before the next appointment round. It would be good for the Academy if the appointments took place well before the start of the councils' term so that the members would have an opportunity to prepare for the work.

Research council members not only represent the Finnish researcher community but they are also, almost without exception, from a Finnish university or a government research institute. There are no limitations as to their background, such as involvement with the corporate sector or a foreign organisation. At a time when the impact of research is becoming more important, we should perhaps consider selecting research council members from a more diverse range of backgrounds. Members of the international researcher community could offer new views and make the science policy discussion more versatile. If the composition of the Board of the Academy will be revised in the future, the possibility of appointing a foreign Board member should be considered. This would increase interaction with the international community.

Conclusion: The current appointment process of research councils is not sufficiently transparent or attractive.

4.4 Research council members should have versatile competence and strong commitment

The members of the Academy's research councils represent the Finnish researcher community instead of their own organisation or discipline. This important principle is usually well-adopted according to observations made by Academy officials. The members are active researchers at various points of their career and thus they form a peer group for researchers who are applying for funding. On the basis of interviews with research council members, it would be advisable that at least some members would have previous experience in reviewing funding applications as well as expertise in science policy. The chair in particular should have qualities suitable for the task at hand. For example, the person should be engaging, respected, widely competent and experienced in leadership. Members should be able to view the research field as broadly as possible. It is important for the operating ability of a research council that members are not to a great extent disqualified from making funding decisions.

On the basis of the interviews, research council work was considered in many ways to be interesting and rewarding, and it was also to some extent regarded as an honorary duty. The work extends the perspective of the members over the research environment through new disciplines, ideas and methods. Work in the research council develops members' assessment competence and their routine of creating applications. All of this benefits a researcher's own skills and abilities. Through the work, they feel that they can affect the operation of the Finnish research community and improve the quality of research. However, the work requires well-balanced commitment. Reviewing hundreds of applications and review reports and other council work requires a lot of time, about 10–30 per cent of working time throughout the year according to members' estimates; an average of one day per week. The chair is clearly required to spend even more time.

A research council member's greatest task is to review research funding applications and comment on them. In addition, a member has other science policy duties and a varying amount of, for example, international tasks of the Academy and representation in working groups of Academy Programmes. All in all, the task description of a research council member is considered to be quite versatile and interesting.

When members were interviewed, they said that they usually learn to predict and organise their workload better as their three-year term progresses, but a lot of time is always spent on reading applications and reviews when processing applications. It also takes time to adopt other science-policy-related tasks. A versatile task description is typically so profoundly adopted during the three-year term that it motivates continuation to a second term.

Conclusion: Active researchers who are committed and have versatile expertise are needed for research council work.

4.5 Relationship with the Board is developing

With the legislative amendment in 2014, research council chairs are no longer Board members in the renewed composition of the Board of the Academy. An objective of the amendment was to increase the Academy's ability to react on the basis of recommendations made by the Academy's international assessment. However, based on research council member interviews, there is a risk that the Board will distance itself from the research councils. It should be ensured that the Board has sufficient opportunities to meet the members. Traditionally, such meetings have been organised twice during a research council term.

The research councils implement the Academy's strategic objectives and their own science policy. Each research council prepares an annual planning document and reviews its policy. The Board of the Academy takes the documents into consideration when granting research funding.

The research councils are autonomous when they decide the allocation of funding between the funding schemes and when they provide funding for projects that they consider worthy. The Board of the Academy makes decisions on the available funding schemes but research councils can actively participate in developing new schemes. For example, the funding for clinical researchers by the Research Council for Health was formed on the basis of the Research Council's needs related to the special position of researchers who are engaged in clinical medical care. The Research Management Group, which has been in operation since 2014, also forms a common discussion forum for research councils for preparing proposals.

Conclusion: Models for cooperation between the Board and the research councils must be considered.

4.6 Competent Administration Office

During the interviews, research council members said they were content with the high-quality support they had received from the Academy's Administration Office and in particular from the officials of the research units. The Administration Office is considered to be competent and reliable and it is also recognised in the Academy's international assessment (2013) and the interest group survey (2016). The Administration Office has a key role in orientating the research councils into decision-making and other science policy work and in ensuring that the decision-making process is carried out according to the law and following the principles of good administration. The process by which applications are reviewed is regarded as reliable and the Administration Office carries it out in a competent manner.

The science advisers of the research units act as presenting officials for the research councils. The Administration Office and its presenting officials prepare decision proposals for each council along with all necessary information. A presenting official has a great deal of responsibility and they can access a vast amount of data in order to review the background for a decision. Based on the interviews, a council can rely on the fact that it will make decisions in accordance with the law and on the basis of necessary information.

Conclusion: A competent Administration Office is a necessary resource for the work of research councils.

4.7 Relationship between a research council and the review of applications

The review of applications is the most resource-consuming phase in the Academy's funding process. The majority of applications submitted to a research council are processed in connection with the September call; there are only individual calls at other times. The Administration Office groups the approximately 3,000 applications submitted to the Academy during September call for reviewing, mainly in scientific review panels. The processing of applications is in general considered to be of high quality and cost-efficient (Academy's international assessment 2013). The process is often criticised for its duration; typically, it takes more than seven months from the point when applications are submitted to when decisions on them are made. There is also criticism related to the nontransparency of the process. The process can also be seen as heavy as all applications

go through the same processing. These are important observations but key objectives in the current model – trust, high quality and efficiency of the assessment process and decision-making, the sensibility of the application process and the usefulness of feedback from the applicant’s point of view, and good administration – are realised.

The Academy has discussed reducing the number of applications and considered possible solutions⁴, but an evident solution has not however been found. There are various ways used in other countries to cut down the number of applications to be reviewed, such as only processing the best applications in panels on the basis of advance statements, or by organising calls in two phases. In some cases, unsuccessful applicants are prohibited from applying for a specific period of time.

During the panel processing, two advance statements are first given on each application, on the basis of which a panel holds a discussion and a panel statement is compiled following the discussion. Alternatively, two separate statements are issued on an application.

The Academy’s research councils do not take part in the scientific review of applications. The review is carried out by expert panels recruited by the Administration Office or by individual experts. The review process produces a numeric and written assessment (scientific quality) of each application (rating). Panels do not rank the applications in any other way. The research council’s task is to integrate statements received from various panels and also consider other science policy principles approved by the Academy and those of research councils, and then rank the applications. The added value of research council work is significant.

In practice, a research council does not prepare a complete ranking list of all applications. On the basis of Table 2, it is clear that the actual selection is made from among those with a rating of 5 and 6, of which typically only about half can be funded. Usually, a reserve list is created from among them. Projects can then be taken from the list in the order they are in to receive funding, if someone declines the funding for some reason, for example.

Panel rating	2013/appl.	2013/funded	2014/appl.	2014/funded	2015/appl.	2015/funded
1	5	0	12	0	4	0
2	73	0	83	0	93	0
3	274	0	281	1	272	0
4	371	3	298	0	428	1
5	259	110	289	89	264	114
6	59	53	87	73	77	70
TOTAL	1,041	166	1,050	162	1,138	185

Table 2. Score distribution of Academy Project applications reviewed by panels during Academy Project funding calls in 2013–2015. Source: Academy of Finland research funding cube.

According to the current procedure, a research council goes through all applications and statements issued on them before decision-making, the main focus in particular being on applications with a rating between 4 and 6. During the recent processing of applications for key project funding, the panel ranked the best 30 per cent of applications. The Research Council for Health has already for some time requested that the applications from Academy Professor panels also be ranked. Otherwise, the panels’ review (rating) and the research council’s ranking have been separated. In some foreign organisations, panels rank all applications, and panels may also have a predefined budget.

⁴ Arja Kallio et al., *Miten hakupainetta voidaan vähentää – vain voidaanko?* (How can the application pressure be alleviated – or can it?) Internal working group report, Academy of Finland Administration Office, 1 October 2015.

For a research council, an important objective of in the review of applications is how so-called weak signals, which will in particular renew science, can be detected from researcher-driven plans. The review process must not be too mechanical so that ambitious ideas that open new channels are not overshadowed by research plans that are of high quality as such, but created on safe ideas.

Conclusion: Ranking applications reviewed by panels is the research council's key science policy task.

4.8 Feedback to applicants

A great number of extremely good applications are left without funding, and applicants try to improve their next applications on the basis of the review statements. In future, based on a decision made by the Board of the Academy in 2016, in addition to a statement on their application and general statistics on the call, applicants will receive a justification for the decision. From the research councils' perspective, it is increasingly important that the feedback received from the Academy helps an applicant improve their application or understand why it was not successful this time around, even though there were not necessarily any major deficiencies. It may also often be the case that an applicant submits an improved version of an application again the following year, but regardless of resubmission it still may be left without funding.

Conclusion: Feedback received from the Academy of Finland must benefit the applicant.

4.9 More mutual cooperation between research councils

Currently, the cooperation between research councils is carried out in particular within the framework of Academy Programmes, joint preparatory groups or seminars. In addition, several joint panels between research councils are formed during application review. During the interviews, research council members expressed a wish to have more systematic cooperation between research councils. In order to develop common operating methods and the processing of applications, regular meetings were suggested in which cooperation could be discussed. The Research Management Group is such a forum but it only consists of research council chairs.

The research council structure of the Academy facilitates the funding of multidisciplinary applications. For several years, review panels have been arranged that accept applications addressed to more than one research council. Joint panels are formed where necessary (e.g. panels for microbiology (RCBE and RCH) and social environment research (RCBE and RCCS)). In an independent international assessment on the Academy⁵, the Academy was considered to be capable of taking multidisciplinary applications into consideration in its review process:

- *“All such processes face difficulties in addressing inter-disciplinary proposals, and while the research community expresses anxiety that this may also be the case at the Academy, panels can be used flexibly to tackle the problem at the initiative of Academy staff and panel chairs. Available evidence suggests the success rates for mono- and inter-disciplinary proposals are in fact similar.”*
- *“It is to be noted, however, that the Academy commissioned a study⁶ of multi- or interdisciplinary applications and their treatment and found that the acceptance rate for disciplinary and interdisciplinary research proposals was the same: 19% for the former and 21% for the latter. This is an interesting case where popular perceptions are perhaps in contradiction with reality.”*

On the basis of statistics, the success rate of multi-research-council applications received by the Academy is more or less the same as that of so-called single-research-council applications. The review process works, but decision-making always takes place in one research council, even in the case of a multidisciplinary consortium.

⁵ See reference 1.

⁶ Henrik Bruun, Janne Hukkinen, Katri Huutoniemi, Julie Thompson Klein, *Promoting Interdisciplinary Research: The Case of the Academy of Finland*, Publications of the Academy of Finland 8/05, Edita Oy, Helsinki, Finland 2005.

However, it became evident during discussions with stakeholders that there is special concern about the treatment of multidisciplinary applications.

Various mechanisms have been developed in other countries to deal with this problem, such as multidisciplinary panels in which all multidisciplinary applications are placed, or even separate multidisciplinary councils. When the Academy's operations are being developed, a possible solution could be divisions or preparatory groups between research councils, which has already been trialled. This kind of cooperation has been used for a long time in Academy Programmes.

Conclusion: Research councils should cooperate more, both in application reviewing and in specifying common principles.

5. Conclusions and procedure proposals

5.1 Change outlook for the operating environment

The national and international operating environments are changing quickly. The favourable development of R&D funding in Finland over the past 15 years has started to decline. For the Academy of Finland, the proportion and amount of funds available to research councils have reduced and new, experimental funding schemes have replaced old ones. Discussion about the impact of research is picking up speed. How can significant public investments be used to obtain results that are visible as an improved level of research and seen to promote wellbeing in Finland? From an international perspective, research is continuously evolving, but currently it is also possible to face more complex challenges and more quickly than before. There is demand for and interest in research, and in the use of public funds.

The Academy's role as an implementer of science policy has become stronger as a result of new funding schemes that support research environments. We should consider how this is reflected on the operation of the research councils. How should the research councils take into consideration the strategies of research organisations when making decisions?

These kinds of perspectives could affect a research council's future workload, tasks and attractiveness.

5.2 Development of research council work

Several development needs and detailed proposals related to the research councils' work have been identified as the work has progressed. In the following, these have been grouped into six components in the form of procedure proposals.

5.2.1 *More open appointment process, attractive vantage point to science policy*

The letter sent from the Ministry to the researcher community and possibly to a wider target group for the nomination of candidates should describe the tasks of a research council member and chair in an attractive and sufficiently detailed manner. Brief mention should be made of the types and range of desired competencies and the kinds of personal characteristics that members should have.

From the Academy's perspective, it could be considered whether it should have a stronger role in the appointment process. This could be achieved if the candidates were interviewed, for example.

It should also be considered whether the appointment process could be completely open, in which case the Ministry would target the application letter directly to the researcher community and ask candidates to step forward.

5.2.2 Clear rules for research council members' possibility to apply for Academy funding

When the research council members and chairs start their term, they should be aware of their possibility to apply for research funding from the Academy. Since the research councils consist of active members of the researcher community, they nearly always have a high level of interest in applying for research funding during their term in office. If they can apply for funding from the funding schemes decided by their research council, it will increase the workload of the other members and make decision-making more difficult due to disqualification issues.

5.2.3 Members from various fields

In practice, research council members are appointed from the Finnish researcher community, universities and research institutes. The Board of the Academy includes one representative from the business sector. The perspective could be broadened if the research council included a person with a background in research and experience in the business sector. It should also be considered whether there should be a more profound international link in research councils. A professor working abroad could broaden perspectives also in terms of a research council's science policy discussion. This could be a working solution also in the Board of the Academy. The administrative language of the Administration Office is Finnish; in this case, the language issue could be resolved by offering necessary material for research council work also in English.

5.2.4 More cooperation and a more balanced workload

Increasing the cooperation between research councils has been brought up in several connections. In general, there have been requests for joint annual meetings to discuss policy outlines and perhaps agree on common strategic targets. This could also benefit the research councils' planning meetings and develop their internal dynamics. Spring would be the most practical time to organise this kind of joint meeting before the research councils start to prepare their funding decisions. At the same time, it could be considered whether cooperation could be developed between the research councils, the Finnish Research Infrastructure Committee and the Strategic Research Council.

The needs of work distribution, cooperation and communication between research councils, the Administration Office and the Board should also be considered. For example, a workshop on the roles of these actors could be organised at the regularly scheduled halfway seminar held by the research councils and the Board.

The processing of multidisciplinary applications is related to the cooperation between research councils and to the development of the review process. If there are any development needs, joint forums or working groups are good opportunities to consider them.

The workload of research councils is not evenly distributed throughout the year. The most work-intensive phase falls between March and June when members read the applications and statements issued on them and get prepared for the preparatory and decision meetings. In the same connection, in May and June, research councils plan the outlines for the next year, supported by the corresponding research unit. The possibility of rescheduling these two operations should be considered.

The number of applications received by research councils varies to some extent, which means that the members of different research councils are in an unequal position. A development suggestion could be to increase flexibility in terms of the size of research councils. This would naturally require a regulation revision. The task of a research chair is also clearly more extensive than that of other members. In this respect, it should be considered whether the responsibility of vice chairs could be increased, which should perhaps be considered already at the nomination phase.

In addition, good practice might involve a member's own organisation taking account of research council membership, by lightening the member's duties.

5.2.5 Continuous development of review practices

Panels that review applications and the disciplines they cover are fixed at the Academy only once the applications have been received and when the groups in which the applications will be placed can be determined. Another alternative is used by the European Research Council (ERC), for example, in which the disciplines included in panels are predefined, and an applicant specifies the panel in which they wish to have their application processed. This kind of practice at the Academy could slightly reduce the workload of the Administration Office. Further, if panels would prepare rankings of applications in a way similar to the ERC, the research council's workload might slightly decrease when the ranking based on the scientific review would be ready. If panels had specified budgets, the situation would become easier for the research council. All this would require that there would be a sufficient number of applications in each panel for proper competition. There is great annual variation among the Academy's applicants, and the panel structure cannot be predicted very precisely for each year. In this respect, the current method in which the panel distribution has not been predefined optimises the equal treatment of all applications. A partial ranking by panels was trialled in connection with the key project funding scheme, for example, and experience obtained from that trial should definitely be used in new situations as well.

Panel ratings are not always comparable. Possible reasons could include that the level of applications in various panels is higher or lower than usual, that the review culture varies between disciplines or that there are differences in the internal dynamics of panels. Therefore, a research council has to compare applications reviewed by different panels with each other. If a panel included a representative from the Administration Office or even a research council, for example, as chair, it could increase the comparability of panels. On the other hand, this would blur the boundary between application reviews conducted by panels and the ranking prepared by a research council, which has been considered an important part of the Academy's application processing.

Often, an application submitted to the Academy is an improved version from the year before. In order to improve the feedback given to applicants, they could be asked to highlight how they have changed their application compared to the previous round. This could be taken into account in the review panel.

5.2.6 New operating methods

A "Research Council Member's Manual" has been suggested to help orientate new members to research council work and to make the practical work easier. This would be a task-oriented version of the Academy's current decision-maker's guide, which is distributed in connection with the orientation, and which does not consider the practical research council work as such. The manual would be based on the task description of an individual research council member.

The mutual role of research council members and officials of the Administration Office is clear, and it is still an important part of the orientation to emphasise that role from presentation all the way through to decision-making. New functional practices are being developed in the Academy's research units in order to make the process more fluent. The practices should be discussed with the corresponding research council.

Virtual connections for research council and working group meetings should be used much more than at present. In general, it would be important to recognise and develop the possibilities for using digital tools.

5.3 Alternatives for research council structure

This section describes five alternatives for developing the research councils' operational practices and structure. The alternatives have been formed by considering the above-mentioned development trends and by identifying practices used elsewhere. The objective of the models and the SWOT analyses is to offer a basis for discussions on developing the research councils' work and possibly also its structures. There may also be other model alternatives.

The key in the development work and in changing the structure is to preserve the important objectives adopted by the Academy. Research council work is maintained at a high level and it is motivating and sensible in terms of workload. The quality of the review of applications is maintained at a high level also in cases of reduced personnel resources. The researcher community's trust in the Academy's operations must be preserved. The principles of good administration are followed in all operations of the Academy. The SWOT analyses have been prepared with these objectives in mind.

Model 1. Model 1 is based on the current four research councils (RCs) mentioned in the decree concerning the Academy of Finland. There is variation at the interfaces of the research councils; for example, a representative of a certain field may act in two research councils. Application processing uses joint research council forums, which is also realised to some extent today. The funding decisions are made research-council-specifically just as before. The development focuses mainly on operational methods, such as panel work.

<p><i>Strengths:</i></p> <ul style="list-style-type: none"> • The RCs' own principles and practices that account for the special characteristics of disciplines are preserved. • The current number of members (44) is sufficient. • RC membership is a respected vantage point. • New operating methods, cooperation platforms and forums could be formed for RCs. • The current method is resource-efficient in relation to quality and costs. • Customer experience: good • The work of the Administration Office and the RCs is of high quality. 	<p><i>Weaknesses:</i></p> <ul style="list-style-type: none"> • The work will continue to be too isolated unless the operational practices are changed. • A RC member's workload will remain the same in the current model. • Trust: the composition of a RC is not always optimal; all disciplines are not always represented. • The funding process is slow.
<p><i>Opportunities:</i></p> <ul style="list-style-type: none"> • RCs could conduct more science-policy-related communication and give statements and comments on issues within their own field of expertise. • The Academy's active role as a pioneer will advance the renewal of research. • If necessary, the current model also enables conducting science policy, if operational practices are changed. • Firm external trust in the Academy enables long-term reform and the renewal of science. 	<p><i>Threats:</i></p> <ul style="list-style-type: none"> • Different RC principles and practices enable applicants to use the system to their benefit to some extent. • Decision-making at the Academy level does not seem to be completely in line, if the principles that govern RC decision-making vary to a great extent. • Preserving the current model could maintain a conservative view of the Academy's operations. • If political actors do not trust the Academy, its funding will be jeopardised. • Pioneering role: Trust is lost if there is no capacity for renewal.

Model 2. In model 2, the research councils (RCs) are appointed in the same way as at present but they operate in the form of various flexible, formal bodies and compositions right from the start (cf. current Centre of Excellence preparation concept). The decisions are made by various bodies (subcommittees) formed by research council members. The subcommittees are named in a flexible manner. They can be set up for three years or a year, as necessary. Isolated research council work is replaced by cooperation in terms of decision-making. The research councils also assemble by disciplines, conduct science policy and prepare operating plans for the next term. The work of review panels will continue unchanged.

<p><i>Strengths:</i></p> <ul style="list-style-type: none"> • Scheme-specific preparatory groups contain members from all RCs, which benefits multidisciplinary applications; experts in certain fields read applications within their own field of 	<p><i>Weaknesses:</i></p> <ul style="list-style-type: none"> • The workload of RCs and the Administration Office is not reduced.
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<p>expertise – the aim in itself is not to distribute applications from as many fields as possible to all members.</p> <ul style="list-style-type: none"> • RC membership is a respected vantage point. • The new cooperation platforms and forums of RCs are built into a model, and cooperation between councils will increase significantly. 	<ul style="list-style-type: none"> • The RC group structure, which they consider valuable, and the formation of group dynamics within a RC are at risk. • The quality of decision-making could weaken. More persons would be involved in preparing decisions who do not necessarily have substance competence on the topic at hand. It is unclear whether this is always for the best of science. • The value of ratings by panels and the importance of the quality of panels increase. • On the other hand, RCs have their own specific principles, but through the process, common practical principles are formed that may be difficult to adopt when making funding decisions.
<p><i>Opportunities:</i></p> <ul style="list-style-type: none"> • As the research landscape is changing, a flexible structure enables quicker reactions; in particular, it could be easier to identify weak signals across several disciplines and to react to them (a summary in a cooperation body). • RCs could conduct more science-policy-related communication and give statements and comments on issues within their own field of expertise. • The researcher community’s trust is preserved or increases. 	<p><i>Threats:</i></p> <ul style="list-style-type: none"> • Since more people on average would be involved in decision-making who do not necessarily have substance competence on the topics at hand, criticism from the research community towards the Academy’s decision-making could increase. • Recruiting RC members becomes more difficult as they process matters that are not related to their own field of expertise. • Recruiting panellists becomes more difficult, which may affect the quality of panels.

Model 3. Model 3 is based on three research councils (RCs) as in the European Research Council (ERC): physical and engineering sciences (PE), life science (LS), and social science and humanities (SSH). Part of environmental research would be transferred to PE. Otherwise, the structure and decision-making would be the same as currently.

Model 3 removes the interface between two current RCs but increases the subsections of the new one (LS).

<p><i>Strengths:</i></p> <ul style="list-style-type: none"> • Workload more even than at present for all members of the three councils. • Makes the preparation and decision-making of funding decisions easier on applications that are in the middle ground between the current RCBE/RCH. • Members of the RCLS with a wider field of expertise. • RCLS comparable with two other councils in terms of size. • RCLS has a better opportunity to detect new openings. • Operating costs reduced as the number of RCs drops from four to three. • The model contains about as many positives as negatives for an applicant, so the end result is neutral. 	<p><i>Weaknesses:</i></p> <ul style="list-style-type: none"> • Number of applications not reduced. • It will be more difficult for the RCLS to manage and compare all disciplines as it has more disciplines to cover. • RC mergers are always a challenge for resource efficiency.
<p><i>Opportunities:</i></p> <ul style="list-style-type: none"> • Uniform operation with international organisations (in particular ERC), good for applicants. 	<p><i>Threats:</i></p> <ul style="list-style-type: none"> • Opposition from the science community, traditions are rooted firmly.

<ul style="list-style-type: none"> • Creates new possibilities in terms of the external operating environment, could bring new ideas to the applicants' plans. • The more extensive range of subsections of the new RC could make council work more interesting and effective. 	<ul style="list-style-type: none"> • Supervision of interests becomes stronger in the fields of biomedicine and medicine.
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Model 4. Model 4 is based on a single research council (RC) of 15 members. The model rests firmly on panel reviews and funding recommendations (rankings) by panels. Members should have a broad view of science, and the RC operates more firmly as a science policy decision-making body. The panel prepares both a scientific review and a funding recommendation for the decision-making body. Preparatory groups for funding decisions could be formed to which external experts would be invited. The RC makes the decisions, also possibly in various compositions. (The operation of the Board's General Subcommittee could be used as a model; they hold preparatory meetings that involve experts from a wide range of fields).

<p><i>Strengths:</i></p> <ul style="list-style-type: none"> • Less defending of own discipline (trust/high quality). • Reduced costs of council work (efficiency). • Increases the attractiveness of council work as the power of decision-making is allocated to fewer people. 	<p><i>Weaknesses:</i></p> <ul style="list-style-type: none"> • Increases the authority, workload and costs of the preparation system of funding decisions. • The authority and workload of an individual member increase.
<p><i>Opportunities:</i></p> <ul style="list-style-type: none"> • It is easier to identify weak signals from research and possibly react to them quicker as there is some kind of an overview of all applications (pioneering). 	<p><i>Threats:</i></p> <ul style="list-style-type: none"> • Requires several changes in operating methods, in which case quality could suffer (trust is weakened). • Too much authority is transferred to panels that prepare the rankings (funding decisions still made by the RC); the authority of the RC is reduced. • Researchers' interests and willingness to participate in the RC is reduced as council work is no longer targeted at promoting their own discipline (also other tasks than those related to funding decisions). • It is challenging to compile a balanced and versatile RC. • As the workload increases, the RC is unable to participate in any other work in addition to tasks under its own authority.

Model 5. Model 5 would include no research councils (RCs), but instead permanent main-discipline-based committees, so-called standing committees. A single standing committee for various disciplines (e.g. N16 classification), for example, ten persons who make decision preparations for applications in a specific discipline. Typically, a committee that prepares decisions is a subset of the current RC's field of operation. Decisions would be made by the Administration Office. Committees are appointed by the Board of the Academy.

<p><i>Strengths:</i></p> <ul style="list-style-type: none"> • Flexible committee appointment. • More substance competence in the discipline in question when decisions are being prepared (trust and quality). 	<p><i>Weaknesses:</i></p> <ul style="list-style-type: none"> • Authority relies on the appointer. • The committee is no longer a science political operator: Will it reduce willingness to participate? • It is unclear who is using the Academy's voice.
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	<ul style="list-style-type: none"> • Possibly uneven quality between committees (quality). • Increased resource need for the Administration Office.
<p><i>Opportunities:</i></p> <ul style="list-style-type: none"> • More substance competence in the discipline in question when decisions are being prepared (trust and quality). • Use of foreign experts in committees. 	<p><i>Threats:</i></p> <ul style="list-style-type: none"> • The Academy's science policy authority is reduced. • Trust in the science community is reduced. • The science community in Finland may be too small for this model. • Other science political operation is reduced.

Appendices

Appendix 1. Extract from Government Decree on the Academy of Finland, Academy of Finland's Rules of Procedure

Extract from Act on the Academy of Finland (922/2009)

The Academy has research councils as laid down by a Government decree. These research councils carry out the Academy's duties within their respective fields of expertise.

The Government shall appoint a chair and no more than ten other members to the research councils for three years at a time. The members of each council shall select from among their number the first and second vice chair. Councils shall represent versatile scientific expertise of a high standard. A person may be appointed as a chairman or member of the Board for no more than two consecutive terms. A person may be appointed chair or a member of a research council for a maximum of three consecutive terms if he or she acts as chair for one or two of these terms.

Before appointing the research councils, the Ministry shall hear the universities, major government research institutes, public authorities and corporate bodies representing research and development, major scientific societies and science academies.

Extract from Government Decree on the Academy of Finland (979/2009)

Research councils

The Academy of Finland shall have the following research councils:

- 1) Research Council for Biosciences and Environment
- 2) Research Council for Culture and Society
- 3) Research Council for Natural Sciences and Engineering
- 4) Research Council for Health.

Functioning of the Board and the Research Councils

The Board, the Research Councils, the subcommittees, the Finnish Research Infrastructure Committee and the Strategic Research Council shall be convened by the chair or vice chair. The meeting constitutes a quorum when the chair or vice chair and at least half of the other members are present.

Matters shall be decided by a simple majority. If there is a tie, the chair has the deciding vote.

Matters shall be decided upon presentation in the Board and other bodies mentioned in Section 1.

Chairs and members of the Board, the Research Councils and the Strategic Research Council shall be paid a monthly remuneration that is determined by the Ministry of Education, Science and Culture. The chairs and members of the Finnish Research Infrastructure Committee and subcommittees appointed by the Board may be remunerated as confirmed by the Academy.

Academy of Finland Rules of Procedure, extract concerning research councils (25 Aug 2016)

Research councils

Section 2

A research council takes care of the Academy's tasks within its field of operation. The chair of a research council resolves matters that belong to the research council unless otherwise regulated or specified in these rules. The chair of a research council may ask the research council to resolve a matter under their authority.

A research council makes decisions as a college on the following matters:

- 1) council's operational and financial plan, a performance agreement proposal and the use plan of authority and funding allocated to the council;
- 2) granting funds to research projects and promoting research unless that task has been assigned to a specifically appointed unit, or if it is a question of changing the terms of funding of minor importance based on a request from an applicant, or a funding decision from a reserve position within limits set by a council;
- 3) (overruled on 5 November 2015); [deciding on reviewers]
- 4) monitoring the results of projects that have received funding and approving the final reports;
- 5) far-reaching or in principle significant matters that concern the council's field of operation, unless the matter belongs to the Board;
- 6) concluding a cooperation agreement concerning the promotion of international or other research or similar transaction within the council's authority and budget;
- 7) funding for an international research infrastructure when cooperation is not based on a government agreement or an international administration agreement concluded by an administrative official superior to the Academy, and monitoring the funding that has been granted;
- 8) from initiatives to promoting science;
- 9) presentations and statements to the Board or the Administration Office.

Appendix 2. Description of current research council nomination process

The Ministry of Education, Science and Culture sends a request letter for nominating candidates as research council members of the Academy of Finland for the next three-year term. The letter is sent at the beginning of the nomination year. The distribution includes the Prime Minister's Office, ministries, universities, The Federation of Finnish Learned Societies, The Council of Finnish Academies, Tekes and government research institutes. The Academy of Finland receives the letter for information purposes.

The parties mentioned in the letter submit their proposal to the Ministry by the end of June. A short justification must be included that clearly states the candidate's field of research, discipline, scientific track record, knowledge in research administration and other key merits for the task in question. A candidate's CV must be attached and their consent must be verified. It must also be ensured that the candidates are not already available for a position as a university board member or chair if they are appointed to the research council.

After the summer, the Ministry starts to work on the proposal. Members whose turn it is to resign are naturally taken into account. Otherwise, there is a broad spectrum of representatives available from various disciplines and organisations on the basis of proposals. Various perspectives are considered in the presentation prepared on the basis of proposals and the research councils' fields. These include, among other things, gender equality and a balanced representation of certain vast areas, such as humanities and social science. The greatest disciplines and organisations are always represented in the research council composition, but a selective alternation must take place for smaller parties so that they will be represented at regular intervals. There are no quotas for various fields or organisations. A Ministry official in charge of preparations contacts the Academy in order to ensure a sufficient coverage of disciplines.

According to the Act on the Academy of Finland, research councils shall represent versatile scientific expertise of a high standard. In addition, the successful fulfilment of the Academy of Finland's tasks requires that research council members have experience in international research cooperation and knowledge about the Finnish research system and overall science policy. Organisations that nominate candidates are responsible for the scientific qualification of candidates for council work. Seconding the nomination of a candidate presented by another party improves the candidate's possibility to be appointed.

A similar alternation of disciplines and organisations should be applied to the chairs of research councils as to the members. When the final presentation is being prepared, the Ministry's official contacts new chair candidates by phone.

Before a decision proposal is prepared, a hearing is organised led by the Minister that includes UNIFI, the Federation of Finnish Learned Societies, the Council of Finnish Academies and the Academy of Finland. Individual names are not discussed at the hearing but a complete list of candidates is available. Feedback received from the discussion is taken into account when the decision proposal is being prepared. Following a presentation from the Ministry, the Government appoints the Academy's research councils for a three-year term towards the end of the year.

Appendix 3. Tasks of a council member – situation in 2016

1. Processing research funding applications

<p>A) Funding forms processed and decided by a research council: Academy Project funding, targeted Academy Project funding, funding for research post as Academy Research Fellow, funding for research post as Postdoctoral Researcher, research council's own special funding schemes</p>
<p>Before a call opens</p>
<p>Participating in call guidance</p> <ul style="list-style-type: none"> The Academy's science advisers are primarily responsible for call guidance; research council members participate in communications in their own organisations by taking part in the Ask & Apply tour, for example.
<p>Suggesting international reviewers</p> <ul style="list-style-type: none"> In order to support the work of the science advisers, research council members suggest international experts who could be invited to join review panels.
<p>Deciding on general principles</p> <ul style="list-style-type: none"> Research councils make decisions on scheme-specific principles and criteria that steer the funding decision process and which they apply when making selections between applications that are of excellent scientific quality. The principles are published on the Academy's website before a call is opened.
<p>After the call has closed</p>
<p>Reporting disqualification</p> <ul style="list-style-type: none"> Situations involving disqualification have been specified in detail, and the Administration Office provides orientation and assists in resolving unclear cases. The science advisers enter the incapacity of each research council member in the Academy's online system after which a disqualified research council member does not in any way participate in the processing of the application in question.
<p>Deciding on applications that will not be reviewed or funded</p> <ul style="list-style-type: none"> The research council decides on applications that will not be reviewed or funded. There are detailed instructions for such decisions, and the Administration Office provides advice and proposals. Changes in practices in 2016.
<p>After the review panels</p>
<p>Reviewing applications and review reports</p> <ul style="list-style-type: none"> The science advisers distribute the applications to research council members so that there are 1–3 members (depending on the rating) responsible for each application. The members go through the applications assigned to them and the review reports issued by review panels. This work phase is the most time-consuming part for the members.
<p>Participating in meetings for preparing funding decisions</p> <ul style="list-style-type: none"> The research council members participate in meetings in which funding decisions are prepared and possibly also in working committees that precede them. Usually, there are at least three day-long meetings in spring. The chair of the research council conducts preparatory meetings, or if they are not available, a vice chair conducts the meeting instead. All applications that could be considered for funding, along with the reviews issued on them, are gone through in the meetings. For each application, the members responsible for it account their views and the entire research council, considering any disqualifications, can participate in the discussion. If requested by a member in charge, applications with a lower rating are also included in the discussion.

- An important part of preparatory meetings is also the discussion about the research council's funding principles and science policy focuses, the mutual calibration of ratings given by various review panels and the research council's budget authority.
- Based on discussions that have taken place in preparatory meetings, the research council creates a list of applications to be funded and a reserve list for each funding scheme.

Preparing justifications for decisions

- As of the beginning of 2017, research councils will prepare a justification for each funding decision.
- Since this is a new task, it is difficult to specify in more detail how it will be carried out in practice and how much time it will take.

Participating in meetings for making funding decisions

- Research council members participate in meetings in which the funding decisions are made. Meeting practices vary between research councils; often the meetings in which decisions are made are held in connection with preparatory meetings.
- The chair of the research council conducts meetings in which decisions are made, or if they are not available, a vice chair conducts the meeting instead.
- A quorum is required, particularly if several persons are disqualified from participating.

After funding decisions

Monitoring research projects that have received funding

- Final reports prepared by researchers and submitted to the Academy at the end of a funding period are the most important products for project monitoring.
- The reports are distributed to research council members by specifying a person in charge for each report. Members review the reports that have been assigned to them.
- The science advisers prepare annual summaries of information collected from the reports. Final reports and observations made on the summaries are discussed in a meeting in December.
- The research council approves the reports that have been submitted.
- The members also participate in researcher meetings and workshops, during which they can meet researchers who have received funding.

B) Other funding schemes of the Academy: funding for research post as Academy Professor, Academy Programmes, Centre of Excellence programme, funding for research infrastructures

Before a call is opened

Suggesting new Academy Programmes

- The research councils prepare proposals for new Academy Programmes as part of their annual result agreement. The practice is currently changing, however, as programme proposals are also accepted through an open consultation. A joint workshop of the research council processes received proposals and makes final proposals to the Academy's Research Management Group.

Participating in the preparations for and decisions on Academy Programmes

- Each Academy Programme receives a steering group consisting of one or several members from each research council depending on the theme of the programme.
- One research council member acts as the chair of the steering group. Programme operation could generate several work duties for the chair in particular.
- The steering group is responsible for the preparation and implementation of the programme.
- The programme subcommittee consisting of steering group members decides the projects that will be funded.

Participating in the work of the Finnish Research Infrastructure Committee

- A member of each research council participates in the operation of the FIRI Committee. The Committee assembles about ten times a year, which could significantly increase the workload of a research council member.

<ul style="list-style-type: none"> The responsibility of the FIRI Committee includes monitoring and developing national and international research infrastructures, drafting a long-term plan on research infrastructures, and making decisions on the selection and funding of research infrastructure projects and monitoring the projects.
<p>Participating in call guidance</p> <ul style="list-style-type: none"> As in section A. Separate briefings can also be arranged on Academy Programmes, Centre of Excellence programmes and calls of the FIRI Committee, in which research council members participate.
<p>Suggesting international reviewers</p> <ul style="list-style-type: none"> As in section A
<p>After the call has closed</p>
<p>Reporting a personal disqualification</p> <ul style="list-style-type: none"> As in section A
<p>After the review panels</p>
<p>Reviewing applications and review reports</p> <ul style="list-style-type: none"> Research council members participate in preparing funding decisions either in their own research council, in joint preparation teams between several research councils, in the steering group of an Academy Programme or in the FIRI committee. Calls can be single- or two-stage. Research council members participate in decision-making in both stages of a two-stage call. Otherwise the procedure is the same as in section A. This task may require a lot of work from a research council member, depending on which working groups they belong to.
<p>Participating in meetings for preparing funding decisions</p> <ul style="list-style-type: none"> Research council members participate in meetings during which funding decisions are prepared. Meetings are run as in section A.
<p>Preparing justifications for decisions</p> <ul style="list-style-type: none"> As in section A
<p>Participating in meetings for making funding decisions</p> <ul style="list-style-type: none"> Research council members participate in meetings during which funding decisions are made. Meetings are run as in section A.
<p>Participating in the work of the General Subcommittee</p> <ul style="list-style-type: none"> The chair of a research council participates in the General Subcommittee's preparatory meetings and decision meetings. The General Subcommittee makes decisions on funding for the Centre of Excellence programme and selects new Academy Professors. It also makes decisions on some other funding schemes.
<p>After funding decisions</p>
<p>Monitoring research projects that have received funding</p> <ul style="list-style-type: none"> As in section A. The steering groups of Academy Programmes carry out the evaluation of a completed programme. The FIRI Committee monitors the research infrastructures that they have funded.

2. Other science-policy-related tasks

<p>Processing the planning documents of a research council</p> <ul style="list-style-type: none"> Research council members participate in preparing the planning documents of their own research council in connection with the research council's planning meeting (once a year) and other meetings. The officials of the Administration Office assist in the process. During preparation, the research council decides on the following issues:

<ul style="list-style-type: none"> ○ prioritisation between funding schemes ○ special research council principles, for example, science policy focus areas ○ participation in international co-funded calls and their mutual order of priority (such as ERA-NET and NordForsk programmes)
<ul style="list-style-type: none"> ● The chair of the research council holds annual agreement negotiations with the head of the corresponding research unit.
<p>International tasks</p>
<ul style="list-style-type: none"> ● Research council members participate in cooperation teams of funding organisations, such as joint committees (NOS) for Nordic research councils. For example, if the responsibility of a chair in a NOS committee was granted to a research council member, it could result in a significant number of new duties.
<ul style="list-style-type: none"> ● Research council members have various tasks related to international research programmes. They could, for example: <ul style="list-style-type: none"> ○ participate in the steering groups of international research programmes ○ represent the Academy in international organisations and research infrastructures.
<p>Special responsibilities of the chair of a research council</p>
<ul style="list-style-type: none"> ● The chairs of research councils participate in the operation of the Board of the Academy; about seven meetings each year. The chairs are entitled to be present and heard at Board meetings but they do not participate in decision-making. ● The chairs participate in the work of the Research Management Group; about seven meetings each year. The Research Management Group handles key questions in terms of planning and consolidating the Academy's operations. ● The chair of a research council uses the research council's authority when deciding on certain changes related to funding applications, such as extending the funding period or changing the site of research. If the chair is not available, the responsibility is transferred to the vice chair.
<p>Role in science policy discussion outside the Academy</p>
<ul style="list-style-type: none"> ● All research council members, in particular the chair, also participate in science policy discussion outside the Academy. ● The chair or another member can represent a research council in cooperation with stakeholders, for example: <ul style="list-style-type: none"> ○ cooperation with foundations ○ the clinical cooperation group of the Research Council for Health that includes deans/directors of faculties of medicine

3. Annual schedule

The example is the meeting schedule of the Research Council for Health for 2015.

Academy of Finland Meeting schedule of the Research Council for Health for 2015			
January 1/2015	week 3 12 Jan at 12.30	Decision-making teleconference - research post as Academy Research Fellow: research grant	
March	week 12 18 Mar at 10.00–	Preparatory council meeting - Academy Project funding (preparation) - Academy of Finland Awards (preparation)	preparatory tables to the RC in week 8–9

April 2/2015	week 17 22 Apr at 10.00–	Decision-making and preparatory meeting <ul style="list-style-type: none"> - September 2014 call: deciding on reviewers - research post as Academy Professor: deciding on reviewers - Academy Project funding - candidates for 2015 Academy of Finland Award - research post as Academy Professor (proposal to General Subcommittee) - research post as Academy Research Fellow (preparation) - funding for clinical researchers (preparation) 	preparatory tables to the RC in week 12
April	week 18 27–28 Apr	Planning seminar, Katinen Manor, Hämeenlinna <ul style="list-style-type: none"> - operational and financial planning 	
May 3/2015	week 20 11 May at 10.00– 16.00	Decision-making and preparatory meeting <ul style="list-style-type: none"> - September 2014 call: research post as Academy Research Fellow - September 2014 call: funding for clinical researchers - research post as Academy Research Fellow: research grant (old) - research post as Academy Professor: research grant (old) - research post as Postdoctoral Researcher (preparation) - High-risk funding pilot (preparation) 	preparatory tables to the RC in week 16
June 4/2015	week 24 10 June at 10.00– 14.00	Decision-making meeting <ul style="list-style-type: none"> - September 2014 call: research post as Postdoctoral Researcher - September 2014 call: high-risk funding pilot - research post as Academy Research Fellow: research grant (new) - prioritisation between funding schemes in terms of reserve list placements - RCH action plan for 2017–2020 and proposal for 2016 performance agreement - discussion about the funding to strengthen university research profiles - presentation of Lauri Aaltonen’s Centre of Excellence 	
September 5/2015	week 36 2 Sep at 10.00– 16.00	Decision-making meeting <ul style="list-style-type: none"> - research post as Academy Professor: research grant (new) - high-risk funding pilot (decision) - discussion about Academy Programmes - kick-off meeting for high-risk projects (meeting with researchers) 	
October 6/2015	week 41 7 Oct at 10.00– 14.00	Research council meeting <ul style="list-style-type: none"> - visit by the President of the Academy - presentations of Taina Pihlajaniemi’s and Mikael Knipi’s Centres of Excellence 	

November 7/2015	week 45 4 Nov at 10.00– 14.00	Preparatory and decision-making meeting - research post as Academy Professor: deciding on letters of intent - visit by director of Strategic Research Unit	preparatory tables to the RC in week 40
December 8/2015	week 50 9 Dec at 10.00– 14.00	Decision-making meeting - September 2015 call: deciding on applications that will not be reviewed or funded - approving final reports for projects that ended in 2014 - September 2015 call: reviewers (discussion topic)	

4. Applications assigned to be a read by an individual research council member

An example of applications addressed to a member of the Research Council for Health in 2015.

Funding scheme	Number of applications	Time for reading
Academy Projects	47	weeks 8–12
Academy Research Fellows	17	weeks 12–17
Postdoctoral Researchers	25	weeks 12–17
Personalised Health (Academy Programme), full applications	15	weeks 20–24
Academy Professors - letters of intent	26	weeks 40–45
- full applications	6	weeks 12–17
High-risk funding pilot	10	weeks 34–36
Total	146	

Appendix 4. Practices of international research funding organisations

1. Steering relation

Funding organisation	Steering ministry, steering relation
Academy of Finland	Ministry of Education and Culture The Academy of Finland is a central science administration agency whose operation is steered by a Board appointed by the Finnish Government. The Ministry does not take part in funding decisions.
European Research Council, ERC	N/A
Ministry of Economy and Competitiveness (MINECO), Spain	MINECO is the Ministry of Economy and Competitiveness. In Spain, funding organisations operate under a suitable ministry (education/industry/science/science and innovation/finance, etc.) The ministry does not take part in funding decisions.
The Austrian Science Fund (FWF), Austria	There are three ministries in the federation, of which the Federal Ministry of Science, Research and Economy (BWF) is responsible for FWF. Of the three funding organisations at the practical level, FWF is the most important research funder.
Research Council of Norway (RCN), Norway	RCN operates under the administration of the Education and Research Ministry; other Ministries are responsible for research within their own administrative sector. RCN coordinates the operations of all ministries. Public administration RCN still controls about 25% of research and development funding in Norway. Income from all ministries in Norway.
The French National Research Agency (ANR), France	Public agency under the Ministry of Science.
The Swedish Research Council (VR), Sweden	VR is a public agency funded by the Ministry of Education and Research. It is a medium for implementing politics.
Deutsche Forschungsgemeinschaft (DFG), Germany	Independent operator under civil law, separate from the government. Funding is received from the federation without accountability. Scientific boards make the decisions.
Economic & Social Research Council (ESRC), UK	Autonomy in relation to the government. Public entity, most of the funding from Dept. for Business, Energy and Industrial Strategy.
Medical Research Council (MRC), UK	Not unit-specific, public, a body under a ministry, funding from the government of the UK.
UK Research Council, UK	Seven research councils that receive funding from the government's research budget. Research budget is administered by the Department for Business, Energy and Industrial Strategy (BEIS).

2. Organisation's status in the national research system

Funding organisation	Funder's social duty
Academy of Finland	Improves the quality and impact of Finnish research, renews science and research environments, makes research more international.
European Research Council, ERC	Organisation that funds basic research of the European Commission. Funding schemes include Starting Grants, Consolidator Grants, Advanced Grants, Proof of Concept and Synergy. Decisions are made by ERC's Scientific Council.
Ministry of Economy and Competitiveness (MINECO), Spain	Promotes high-quality research, education and career development and science and technology, supports centres of expertise and research infrastructures.
The Austrian Science Fund (FWF), Austria	Creates wealth and value in Austria. Main operator in funding basic research. Strengthens and develops the scientific system and promotes the attractiveness of Austria, promotes communication between science, culture and commercial interests, improves competitiveness, international orientation and independent research in Austria: <ol style="list-style-type: none"> 1) promotes scientific operation 2) administers funding 3) reports annually 4) promotes general awareness of scientific research 5) administers grants and programmes on the basis of contracts 6) participates in common European and international programmes and funding instruments

Research Council of Norway (RCN), Norway	<p>Acts as an adviser to the government on research policy. Implements policy and scientific priorities. Identifies research needs, funds research projects which individual institutions could not cover financially themselves.</p> <ol style="list-style-type: none"> 1) develops various disciplines and the research system 2) R&D&I operation of commerce and industry and related research 3) challenges the welfare society in terms of health, welfare and education 4) meets challenges related to the world's energy, climate and environment
The French National Research Agency (ANR), France	<p>Develops science and technology, promotes cross-discipline and international research.</p>
The Swedish Research Council (VR), Sweden	<p>A leading role in developing basic research and a high scientific level in Sweden. Areas of responsibility:</p> <ul style="list-style-type: none"> • allocates funding to research • specifies the strategic focus areas of research to be funded in cooperation with other parties who grant research funding • prepares analyses, assessments and strategic materials related to research and research funding on a national and international level • promotes interaction between researchers and various academic circles and researchers and the rest of society • promotes multi- and cross-discipline research • supports the usability of research results and ensures the impact of the results in the sectors of society in which they can be used, such as education, healthcare, trade and industry • advises the government on research policy • aims to increase national and international cooperation of the research community • takes responsibility in ethical questions related to research • increases understanding about the importance of basic research for society
Deutsche Forschungsgemeinschaft (DFG), Germany	<p>Funds excellent basic research carried out by universities. A small share of funding granted to other parties.</p>
Economic & Social Research Council (ESRC), UK	<p>Consults the Board on welfare, health, social science and education; promotes and supports high-quality research and postgraduate education in social science and economics, develops and forms a national data management infrastructure for the needs of high-quality research, advances social science competence and education and in that way contributes to the UK's financial competitiveness, efficiency of public administration services and quality of life; communicates in a clear manner and promotes the general understanding of social science. Identifies strategic key challenges, coordinates social research. Promotes the use of various methodological approaches and the competence of using the methods. Invests in infrastructures. ODA application processes require participation in reducing poverty, sustainable development or promoting well-being in developing countries.</p>
Medical Research Council (MRC), UK	<p>Promotes and supports research on human health, produces competent researchers, develops and distributes information so that the UK's financial competitiveness is improved, promotes the public discussion and visibility of medical research.</p>
UK Research Council, UK	<p>Promotes research by funding science projects and programmes.</p>

3. Processing, preparation and decision-making processes (incl. review processes)

Funding organisation	Review and decision-making process
Academy of Finland	<p>For example, RCCS: science advisers and secretaries check the applicant's eligibility; the science adviser looks for two reviewers per application and organises panels that contain 25–65 applications, duration 1–2 days. Three working groups prepare the working committee meeting. The RC makes the decisions. The science adviser takes care of communication, payments, monitoring and reporting. The RC approves the final reports.</p>
European Research Council, ERC	<p>A permanent Standing Committee on Panels assigned by the council specifies review criteria and approves the compositions of review panels. Officials at ERC's implementing office (ERCEA) carry out the annual plan approved by ERC's scientific council, organise application processes and reviewing of applications. There are 25 panels that are divided into three groups: Social Sciences and Humanities (SH), Life Sciences (LS), Physical and Engineering Sciences (PE). Panels consist of</p>

	10–16 members. The names of panel chairmen are published before the application period in question ends; the names of other panellists are published after the review process has ended.
Ministry of Economy and Competitiveness (MINECO), Spain	Research officials are responsible for checking the eligibility of applications (a single-phase procedure apart from a few exceptions – two phases in centre of expertise application periods, for example), organising a remote peer review (this is the responsibility of an independent unit) and a panel of experts, and monitoring projects that have received funding. Depending on the number of applications, 2–5 experts/discipline cooperate on the review and monitoring process. 14–18 applications per expert and two independent experts per application. The chairman of a review panel is also the team leader of science experts.
The Austrian Science Fund (FWF), Austria	FWF's board consists of 27 members and their deputies. Review only consists of foreign reviewers; all applications are treated in the same way – no quotas for various fields. Scientific experts check technically -> only then added to the online system → assigned to a specific reviewer and their deputy. Strict ineligibility rules. An applicant may specify a maximum of three persons who they do not wish to take part in the application process. Continuous application period. Clear cases can be rejected without a review (in a different field, an unqualified applicant, errors in the application). If a special application process, 10 days for supplementing the application. The number of reviewers varies from 2–6. Reviews have a certain structure and a scale of 1–5. Two parts, one for the applicant, the other for FWF. If reviews have not been sufficiently justified, they will be ignored. After the council meeting, FWF prepares decisions and sends them to applicants. Parts of the review may be included anonymously as an appendix. There are five standard replies for rejections, see pages 11–12. Rules for reapplying with grades 5 and 1–2 + the aim is to obtain the same reviewers. Changes must be marked. There are several rules for selecting a reviewer that can be referenced on page 13. The maximum term of a council member is nine years.
Research Council of Norway (RCN), Norway	RCN's decision-making process varies depending on funding themes. One of the most extensive funding models is FRIPRO that provides funding for independent projects: 1) FRIPRO team checks that applications comply with application conditions and distributes the applications to panels. 2) Administration selects foreign reviewers. 3) All reviewers in a panel go through all applications, and grade and rank them together. 4) Council (domestic and foreign researchers) makes decisions on funding.
The French National Research Agency (ANR), France	<p>General funding application process consists of two phases: First, a five-page pre-application. Applications are ranked in a review unit based on the average of grades given by reviewers. Only applications that exceed the grade threshold move forward. This is followed by two peer reviews per application. Peer reviewers do not participate in the meetings of the scientific review panel; they act privately, and are in no contact with the panel or any parties of the projects being reviewed. Scientific review committees (CES) review complete applications collectively on the basis of peer reviews. The presenting official of a project produces a review report in connection with a panel. CES compares the applications and ranks them. The consensus of a scientific review panel is summarised into the final review report. ANR collects applications from all themes and funding instruments together and ranks them by challenges, on the basis of the order suggested by CES and within the limits of the budget of a general funding application process.</p> <p>A separate budget has not been allocated to individual councils; instead, budgets have been specified challenge-specifically ("challenge" = a more extensive entity formed by several councils. The selection threshold is determined by an internal council consisting of research officials of social challenge units by comparing compiled ranking lists with the available budget. At this point, the decision is more financial than based on scientific quality.</p>
The Swedish Research Council (VR), Sweden	<p>Applicants suggest a panel. The council assigns the panels that provide the council with recommendations for decision-making on the scientific quality of applications. The council decides the budget.</p> <p>Review panel</p> <ul style="list-style-type: none"> • reviews and classifies the scientific quality of applications issued for the panel • produces the final written assessment on each application • produces a list of projects to be funded within the budget framework of the review panel as well as a ranking for funding • suggests a budget for prioritised projects <p>Members of the research council act as panel observers and transmit information between the panel and the council. Observers do not participate in the review process.</p>

<p>Deutsche Forschungsgemeinschaft (DFG), Germany</p>	<p>48 permanent councils representing all disciplines/subject matters. Applicants select a primary topic; however, the selection can be changed by the staff of the office. Several boards for multidisciplinary applications. Office staff is responsible for administering application and decision-making processes. Voluntary reviewers are responsible for the assessment of the applications' scientific quality. Council members – the majority of whom are independent researchers – are responsible for funding decisions and prioritisation.</p>
<p>Economic & Social Research Council (ESRC), UK</p>	<p>1) Council members do not intervene in the funding of individual applications; instead, they participate in the decision-making concerning funding forms. ESRC is involved in deciding the distribution of funding between various funding mechanisms and channels.</p> <p>2) Employees of a research council go through each application, ensure that it is suitable for the application process in question, and that all necessary appendices have been attached to the application. In addition, they administer and monitor the peer review process, select peer reviewers and monitor panel meetings.</p> <p>3) The majority of applications are processed in this way: officials check the application after it has been received through an online system. At least three peer reviewers are selected for those applications that move forward. If the average grade given by them is above 4.5 (on a scale of 1–6), comments are made anonymously and sent to the applicant. Next, the assessments and feedback are sent to the panel members. After their review (1–10), the applications are ranked for the Grant Delivery Group, which prepares final recommendations for ESRC's research committee.</p>
<p>Medical Research Council (MRC), UK</p>	<p>Two-phase peer assessment process. First, external reviewers prepare an expert assessment on an application. This is followed by a review and funding decision made by a council or a panel. Usually, this consists of two phases: a screening in which applications approved for the next phase are selected and a meeting in which the final funding decision is made. The screening is based on the peer review and assessments made by the council/panel members.</p> <p>Applicants lodge their applications with councils/panels as part of the application process. Information on open application periods and the responsibility area of each council/panel is available for applicants on MRC's website. If necessary, the panel or agency staff may relocate applications to another topic or panel. Applicants are notified if the council or the placement in a funding application form is changed.</p>
<p>UK Research Council, UK</p>	<p>Currently, research grant applications are submitted through an online application system even though a new application submission system is under development. Internal checks happen first (which council, for example) followed by a peer review. Some councils have their own peer reviewers; others have external reviewers. Peer reviewers are selected so that there is expertise in a relevant area, there is an even number of reviewers from the UK and abroad and typically so they have qualifications in the topic area related to the application.</p> <p>Depending on the panel and the number of applications, a list of applications can be made that are processed in a full panel. Members of the Board/panel are experts in various fields who discuss the applications and give peer reviews and make decisions on the suitability of applications for funding. Several funding panels either process specific disciplines or types of grants, such as researcher exchanges or researcher grants, or a research phase.</p>

4. Key grounds and preparation of decisions (scientific review, science policy, selection of reviewers, who carries out preparatory work and the ranking of the projects being reviewed)

Funding organisation	Decision-making principles
<p>Academy of Finland</p>	<p>Quality, impact and ability for renewal. Review scale 1–6. Science-policy-related matters also affect decision-making.</p>
<p>European Research Council, ERC</p>	<p>Scientific quality is vital. Panellists are selected by ERC council members and in particular the vice-presidents (three persons). Panels prepare a ranking.</p>
<p>Ministry of Economy and Competitiveness (MINECO), Spain</p>	<p>The main grounds for decision-making include the scientific review and the ranking prepared by the review panel on the basis of grades. More than 50 thematic panels are organised in connection with each application period. Financial preconditions are also taken into account in the final funding decision in addition to the ranking.</p>
<p>The Austrian Science Fund (FWF), Austria</p>	<p>Quality and competition: FWF's funding operation focuses on investing in the production of new information; international reviewers assess the quality of research on the basis of competitiveness.</p>

	<p>Independence: creativity of basic research requires freedom. Thanks to FWF's judicial independent position, it is able to ensure freedom and secure it from the direct impact of interest groups of science and research.</p> <p>International orientation: FWF follows the standards of the international research community and supports actively cooperation across national borders.</p> <p>Equal treatment of all disciplines: FWF treats all researchers according to the same standards without favouring or discriminating against any disciplines.</p> <p>Openness and justice: FWF aims to avoid collisions of interest by checking and reviewing all phases of the selection process, communicating clearly the methods and the decision-making process in order to thus ensure the acceptability of its operation.</p> <p>Levelling off gender differences: The equal treatment of women and men in research is one of FWF's primary principles and the organisation aims to achieve this objective with the help of special programmes and by levelling off gender differences in all disciplines.</p> <p>Equality: FWF reviews grant applications without considering the applicant's status or academic degree.</p> <p>Ethical principles: Committed to ensuring that scientific practices and internationally approved ethical norms are considered in operations covered by its funding sector.</p>
Research Council of Norway (RCN), Norway	<p>The main review criterion of all applications processed is scientific quality. In the case of research programmes, the reviewing of applications is also based on their relevance to the target themes of the application process in question.</p> <p>When the applications of research projects and young research talents are being reviewed, criteria that are emphasised also contain the strength of scientific thinking and scientific innovativeness. In addition, the competence of project manager and research team will be considered.</p>
The French National Research Agency (ANR), France	<p>The ranking of applications is based on the scientific assessment of a council consisting of peer reviewers. The Scientific Challenge Steering Committee is responsible for specifying the programmes and it consists of representatives of the Minister for the research or topic in question, researcher associations, innovation clusters and cooperation parties. Check the annual work programme on the basis of a national research strategy, the programme of the previous year, and necessary additions. May suggest primary focus areas.</p>
The Swedish Research Council (VR), Sweden	<ul style="list-style-type: none"> • VR has decided that a specific review scale must be used when reviewing applications in the panel; the scale is based on four review criteria (basic criteria) of scientific quality. • Novelty and originality • Scientific quality of an application • Applicant's track record (refers to the applicant's ability to implement a project) • Suitability for implementation
Deutsche Forschungsgemeinschaft (DFG), Germany	<p>Mainly bottom-up funding; no predefined application themes. A small share of top-down funding but the themes are selected on the basis of the bottom-up process. All researchers who work in public, non-commercial institutions (mostly universities) can apply to standardised funding programmes, and all universities can apply to coordinated programmes. The distribution of funding between disciplines and funding forms is assessed as necessary. Application reviewing and selecting reviewers are only based on scientific merits.</p>
Economic & Social Research Council (ESRC), UK	<p>Primary review criteria of scientific top research:</p> <ol style="list-style-type: none"> 1) No conflict of interests 2) originality/opportunity for promoting a discipline 3) research planning and methods 4) costs 5) results, distribution, effects 6) research ethics
Medical Research Council (MRC), UK	<ol style="list-style-type: none"> 1) Importance: how significant are the questions or the lack of prior information that the research aims to answer? 2) Scientific potential: what kinds of possibilities does the project seem to have for good scientific progress? 3) Resources being applied for: is the funding being applied for necessary for the research work of the project, and does the importance/relevance of the project and its scientific potential correspond to the amount of funding being applied for?

	In addition, the following are also reviewed: potential impact and achieving the targeted impact, ethical questions, appropriate use of animal tissue and/or human-origin tissue, methodology and experimental research, and plans related to material management.
UK Research Council, UK	Scientific top research: funding for competitive, peer-reviewed research. Criteria: quality, suitability for implementation, relevance, strategic importance and the effectiveness of research, international competitiveness, the track record of the researcher and research staff, implementation media.

5. Processing multidisciplinary and interdisciplinary applications

Funding organisation	Multidisciplinary
Academy of Finland	Applications are addressed to a single research council. When panels are being assembled, various disciplines as well as multidisciplinary and interdisciplinary projects are taken into account. Multidisciplinary and interdisciplinary projects receive fair treatment according to a study carried out by the Academy.
Ministry of Economy and Competitiveness (MINECO), Spain	A suitable operating method has not yet been found, even if a multidisciplinary panel and review in a couple of panels with variable themes have been trialled.
European Research Council, ERC	Previously, a separate panel for multidisciplinary applications. Currently, a multidisciplinary application is described including the application's key words and several panels are indicated.
The Austrian Science Fund (FWF), Austria	Processed in the same way as other applications expect that reviewers may be changed so that all disciplines are taken into consideration.
Research Council of Norway (RCN), Norway	The aim is to compile review panels in such a way that they cover all related disciplines as well as possible. A multi-disciplinary panel is compiled if there are several applications from the same interdisciplinary field.
The French National Research Agency (ANR), France	Interdisciplinary committees
The Swedish Research Council (VR), Sweden	Cross-disciplinary applications: A special procedure for interdisciplinary applications when research covers several disciplines. Reviewed in a separate interdisciplinary panel.
Deutsche Forschungsgemeinschaft (DFG), Germany	Multidisciplinary panels and reviewers. Several councils involved in decision-making.
Economic & Social Research Council (ESRC), UK	<ol style="list-style-type: none"> 1) Reviewers and panellists are selected to cover all areas of an application. During panel meetings, experts from various fields have an opportunity to discuss and form a common view of the ranking of the applications. 2) ESRC has signed a funding agreement between councils (seven councils in the UK).
Medical Research Council (MRC), UK	Multidisciplinary applications are sent to councils representing the main fields of expertise concerned; reviewers are selected so that they cover all disciplines as well as possible.
UK Research Council, UK	Multidisciplinary applications are sent to councils representing the main field of expertise concerned; reviewers are selected so that they cover all disciplines as well as possible.

Appendix 5. Academy of Finland organisation 1948–2015

- 1939 (Act on the Academy of Finland 1939, so-called Cajander’s Academy, delayed entry into force due to the World War)
- 1948 Academy of Finland starts operation (12 Academicians of Science)
- 1950 the following are founded:
 - government research council for humanities
 - government research council for natural sciences
 - central government research council for science
- 1961 the following are founded in addition to the above councils:
 - research council for medicine
 - research council for agriculture and forestry
 - research council for technology
 - research council for social science
 - joint advisory board
- 1970 restructured Academy of Finland starts operation. It is comprised of six research councils and a central board of research councils (“central organs of science administration”). They were assisted by an administration and finance unit.
- 1973 councils’ secretaries with a position of trust changed into officials. The Administration Office is divided into administration, planning and finance units.
- 1983 Research Council for Environmental Science is established.
- 1994 the Administration Office comprised a council unit, a science policy responsibility area, general and personnel administration responsibility area, financial administration responsibility area, an IT team and an inspection unit.
- 1995 Organisation renewal of the Academy of Finland, four research councils instead of seven:
 - Research Council for Biosciences and Environment (original title was the Research Council for the Environment and Natural Resources)
 - Research Council for Culture and Society
 - Research Council for Natural Sciences and Engineering
 - Research Council for Health.
- 1997 four research units in the Administration Office, a science policy unit, a general and personnel administration unit, a finance and service unit, an IT unit (later known as IT management unit), a researcher exchange unit (later known as international affairs unit) and a communications unit.
- 2013 current units start operation in the Administration Office (incl. units that have been established later on: Academy Programme Unit, Planning and Management Support Unit and Strategic Research Unit).

Appendix 6. Funding opportunities of the Academy of Finland 1995–2015

1995

- Developing country research
- Other funding that supports research
 - Government grants for organising international scientific conferences
 - Alexander von Humboldt Association's grants for inviting a visiting researcher
 - Supporting the return to Finland of a researcher who has worked abroad
 - Seminars and scientific meetings
 - Cooperation groups and networks
 - Inviting a visiting professor or another researcher to Finland
- Grants and allowances for international cooperation
 - EU's research programmes
 - Grants according to researcher exchange agreements
 - Russia research cooperation
 - Cooperation between the Academy of Finland and the Russian Academy of Sciences
 - Grants of a science and technology cooperation commission between Finland and Russia
 - Grants in the University of London's School of Slavonic and East-European Studies Unit
 - Cooperation with Deutscher Akademischer Austausch Dienst (DAAD)
- Grant for specialists with a doctoral dissertation involved in clinical work
- Supporting scientific publications
 - Government allowances for scientific associations
 - Other support for publishing
- Special allowance for researcher education
 - Grants for researcher education positions
 - Grants for organising researcher education courses
 - Researchers' employment abroad and researcher training
 - Researcher education for researchers who work for research facilities, industry, business sector or public administration
 - Grants for researcher education at the European University Institute (EUI)
 - Thomas Jefferson University's grants for researcher education in biochemistry and molecular biology
- Research grants for research projects
- Research programmes
 - Fish reproduction and cultivation
 - Research Programme for Restoration of Boreal Environments
- Researcher posts
 - Academy professor posts
 - Posts of a senior and junior researcher
 - Research assistant posts
- Grants for senior researchers

2006

- Centre of Excellence programmes
- Preparation of international joint projects
- National seminars
- Grants for hiring postdoctoral researchers
 - Research teams
 - Cooperation with a company or public administration

- Individual
- Grants for the employment of foreign researchers in Finland
- Grants for hiring senior researchers
- Start-up allowance for young researchers
- Scientific associations
- Support for organising international scientific conferences
- Support for graduate schools and national researcher training courses
- Researcher exchange grants
- Supporting the return of a researcher to Finland
- Researcher training and working abroad (incl. EUI)
- General call for research grants (so-called May call)
- Research programmes
- Research posts
 - Academy Professors
 - Academy Research Fellows
- Further education of persons in working life

2010

- Funding for research post as Academy Professor
- Academy Project funding
 - Targeted Academy Project funding
 - Funding for development research
 - Joint call in the field of materials science and engineering (Academy of Finland, Tekes and National Science Foundation, NSF)
 - Joint call in the field of biomaterials for medical applications and advanced materials for printed functionality (Academy of Finland, Tekes and Japan Science and Technology Agency, JST)
- Funding for research post as Academy Research Fellow
- Research programme: The Future of Living and Housing
- Funding for clinical researchers
- Funding for research post as Postdoctoral Researcher
 - ERA-AGE 2: FLARE 2 joint call for postdoctoral researchers
- International researcher mobility
 - Mobility funding
 - Fellowship grants from foreign funding agencies
 - JSPS Fellowship to Japan
 - CAS Fellowship to China
- Centres of Excellence in research (2012–2017)
- Research infrastructures (FIRI 2010)

2015 (November)

- Programme call by Strategic Research Council
 - Competent Employees – Successful Labour Market
 - Health, Welfare and Lifestyles
 - Security in a Networked World
 - Urbanisation in Society
 - A Climate-Neutral and Resource-Scarce Finland, supplementary call
- Competitive funding to strengthen university research profiles

2016 (April)

- Academy Programmes and related calls
 - BioFuture2025 Academy Programme, call for letters of intent
 - Health from Cohorts and Biobanks (COHORT) Academy Programme, call for letters of intent
 - International joint call related to the New Energy Academy Programme: Inno Indigo
- Special funding for NSF Graduate Fellows for research in Finland
- SRC matching funds for Horizon 2020 (open-ended call)
- Targeted calls
 - Key project funding, Forging ahead with Research
 - Funding for Antarctic research
 - Research, development and innovation programme ICT 2023: thematic call within autonomous systems and the augmented human
- Centres of Excellence in research (2018–2025), call for letters of intent
- Funding for research infrastructures (FIRI 2016)

2016 (September)

- Academy Project funding, all research fields
- Funding for research post as Academy Research Fellow
- Review of applications for sport science project funding from Ministry of Education, Science and Culture
- SRC matching funds for Horizon 2020
- Targeted call: International joint projects within the ICT 2023 programme: WiFiUS, wireless communications and networking
- Funding for research post as Postdoctoral Researcher
- Special funding for researchers
 - Funding for clinical researchers
 - International researcher mobility based on bilateral agreements

Appendix 7. Academy of Finland's Academy Project funding in 1995-2015

DECISION YEAR	Granted €	Granted, number	Project size
1995	37,811,893	761	49,687
1996	71,084,684	1,291	55,062
1997	79,304,795	927	85,550
1998	85,296,605	975	87,484
1999	90,814,837	1,018	89,209
2000	96,416,944	1,004	96,033
2001	114,962,167	1,095	104,988
2002	52,346,079	587	89,176
2003	59,533,086	769	77,416
2004	65,130,400	691	94,255
2005	59,515,090	728	81,751
2006	82,991,406	783	105,992
2007	115,149,588	699	164,735
2008	122,172,900	596	204,988
2009	130,129,617	522	249,290
2010	147,050,040	422	348,460
2011	99,452,359	243	409,269
2012	95,772,547	214	447,535
2013	91,726,318	212	432,671
2014	89,783,570	197	455,754
2015	96,946,246	218	444,708