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Identifying novel and unconventional research by double-blinded peer review

Liv Langfeldt, Lina Ingeborgrud, Ingvild Reymert, Silje Marie Svartefoss,
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Preface

This report presents the results of an evaluation of the Spark pilot, a research funding instrument which was piloted by the Swiss National Science Foundation (SNSF) in 2019 and 2020 to enable rapid funding of unconventional research ideas. The evaluation report was commissioned by the SNSF, to identify the strengths and weaknesses of the funding instrument, and to provide the SNSF with recommendations on a possible future Spark funding instrument.

The report is written by Liv Langfeldt (project leader), Lina Ingeborgrud, Ingvild Reymert, Silje Marie Svartefoss and Siri Brorstad Borlaug. Silje Marie Svartefoss managed the surveys of the Spark applicants and reviewers.

We are grateful to all the participants in the Spark application and selection process who contributed with input to the evaluation through interviews and survey replies: the Spark applicants in 2019 and 2020, the international expert reviewers and representatives of home institutions, members of the SNSF National Research Council and the SNSF Administrative office.

Oslo, December 2021

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Executive summary

The Spark pilot was initiated by the Swiss National Science Foundation (SNSF) in 2019 as an instrument for rapid funding of unconventional research ideas. For this aim, new review procedures were implemented – including double-blinded evaluations of proposals and selection based on aggregated individual reviews rather than panel negotiations. The purpose of this report is to identify the strengths and weaknesses of the way Spark was set up, and in particular the role of the new review procedures, and so to provide the SNSF with recommendations on a possible future Spark funding instrument.

The evaluation is based on analyses of Spark proposal, applicant and review data, aggregated data for comparisons with other SNSF funding instruments, survey of the researchers who applied for Spark projects and of the experts who reviewed them, as well as interviews with involved heads of labs and departments, members of the SNSF Research Council and the Administrative Office.

Key findings

Overall, the Spark pilot worked according to its intentions. The major goals were achieved, and the new funding instrument with unique terms and a novel selection procedure appears much appreciated among the stakeholders. Spark filled a niche in the Swiss research and funding landscape: it attracted new and younger applicants, and a substantial part of the projects were within the targets of the scheme. The selection process was efficiently managed, and appears to have promoted the main goals of Spark. The double-blinded review helped to attract novel researchers and to focus the assessment on the merits of the projects, not the applicants. Original and unconventional research appears to have been given better chances by including originality and unconventionality as key review criteria and funding proposals based on aggregated reviewer grades (rather than panel negotiations). Below we summarize key findings and point to some challenges that should be addressed in a future Spark.

Spark attracted new and younger applicants and a substantial part of the projects were within the targets of the scheme

A majority of the proposals, as well as of the funded Spark projects, came from applicants who had no previous SNSF grant. They were often younger researchers in temporary positions – with few other funding options. The type of projects differed from other SNSF schemes. Spark projects were smaller, often in need of seed funding to start new research, including research in a field or topic new to the applicant, but also linked to ongoing research. Moreover, judging from survey replies from funded and non-funded applicants, it appears that funded projects more often (than non-funded) concurred with Spark’s aim of addressing unconventional ideas/ideas with limited basis in previous research and to test high-risk/high impact ideas. Most reviewers found the Spark pilot adequate for supporting original, ground-breaking and high-risk research.

Spark filled a niche and integrated well with the Swiss research and funding landscape

Spark appears to have filled a distinct niche in the Swiss research funding landscape, by providing seed funding for novel ideas based on double-blinded review of short proposals. At the same time, the data indicate that Spark filled multiple gaps in Swiss research funding and opened up for a broad set of aims and applicants. The applicants often perceived their Spark proposals not fit for other funding instruments due to their novelty, limited preliminary data, riskiness, and/or eligibility. A majority of applicants had not applied for any other funding for the project in question. However, Spark’s popularity – in terms of its ability to fill a variety of needs for a broad group of applicants – also came with a downside. The scheme attracted a larger number of proposals than prepared for, which implied higher administrative costs, as well as lower success rates.

Adequate selection processes with some challenges

The Spark selection processes promoted original and unconventional research. Including originality and unconventionality as key review criteria and funding proposals based on aggregated reviewer grades, appears to have given original and unconventional research better chances. Omitting panel meetings was also an adequate solution for reducing review costs for small grants.

Overlapping criteria and difficult to assess unconventional research. Reviewers pointed to ‘unconventionality’ and ‘originality’ as two criteria which are difficult to distinguish. The two criteria were overlapping, and the ‘unconventionality’ criterion was less clear to the reviewers than the other review criteria. Moreover,

some reviewers found it hard to assess the ‘unconventionality’ of the proposals, especially when the proposal was not in their field of expertise.

Less risk tolerance in 2020 than in 2019. Due to different budgets and number of proposals, the threshold for approval of a Spark proposal was much higher in 2020 than in 2019. As a consequence, the Spark pilot was less risk-tolerant in 2020 than in 2019. Notably, there were differences in terms of the types of applicants (by their gender, age or type of university) that had the best chances of receiving funding in those two years, but these differences do not appear related to risk tolerance in terms of the different ways the funding threshold was defined.

The double-blinded review played an important and positive role, but created uncertainties

The blinding helped to attract novel researchers and to keep focus on assessing the merits of the projects. An important role of the anonymized proposals was to give a strong signal to the reviewers that they should assess the project description on its own merit, and not consider the merits and competences of the applicants. It also signalled to the applicants that they were welcome to apply regardless of previous research merits in the topic or field of the proposed research. Many applicants were unsure about how well anonymized their proposals were. They thought the reviewers might have identified them or their research environment, or were unsure if they had. Still, both the applicants and other stakeholders appear supportive of the double-blinded review procedure. Our analyses do not provide any evidence that anonymous proposals promoted gender equality, nor that they were detrimental to gender equality.

Harder to assess the novelty of research when proposals are anonymous. Judging from the survey of the reviewers, anonymizing the proposals was considered helpful for about half of them. Those who found it helpful emphasized that it helped assess the research ideas on their own merits and avoid biases. It was also emphasized that with an anonymous project description, it is harder for the reviewer to know if the project as such is new, or part of ongoing research. Hence, in terms of funding research that was not linked to applicants’ previous projects the blinding was an obstacle. 16% of funded applicants reported that their Spark project to a great extent built directly on previous projects where they themselves were the principal investigator.

The selection process was efficiently managed

Algorithm matching of experts worked sufficiently well. For the second Spark call, an algorithm to help find experts matching the individual proposal was developed

and used for the first time. The expert selections informed by the algorithm seems to have resulted in less close matches between experts and proposals, when compared with selection not informed by the algorithm. Still, the difference is small, and when controlling for other factors, the use of the algorithm does not seem to have affected the success rate of the proposals. Notably, all expert assignments were controlled manually, and in some fields the algorithm did not give (appropriate) matches and searches were done manually. All things considered, the algorithm for matching experts to proposals, appears to have worked sufficiently well the way it was used.

Administrative costs for the review and selection process were relatively low. The piloting of Spark caused much work in the SNSF administration because of a lack of adequate ICT tools to handle the large number of proposals and secure anonymized proposals. The funding of small projects, as in the Spark instrument, may easily give higher administrative costs for the review and selection process compared with the size of the grant budget. Still, the SNSF succeeded in keeping the administrative costs of the Spark review and selection process relatively low. When measured relative to the budgets of the funding instruments, costs for running Spark were higher than similar costs for SNSF Project funding, but lower when measured relative to the number of proposals. Moreover, compared with other funding schemes the Spark was less time-demanding for the applicants.

Recommendations

NIFU recommends a continuation of Spark as a funding instrument dedicated to unconventional research. In any continuation, the following challenges pointed out in the evaluation should be addressed: (a) it was hard to keep success rates high and so ensure risk-tolerant funding; (b) the criteria for assessing ‘unconventionality’ and ‘originality’ were not sufficiently defined and understood; (c) reviewers found ‘unconventionality’ hard to assess, especially when the proposal was not in their field of expertise; and (d) keeping the management costs for small projects low. Our suggestions for handling these challenges include:

- *Clearer goals:* Clarify goals and consider harder priorities of the goals and more delimited types of target projects, to reduce the number of proposals and keep success rates high. Consider whether the eligibility criteria fit SNSF’s overall policy and policies for researcher careers.
- *Risk-tolerant funding:* Continue to base selection on aggregated individual review scores, and in particular scores on originality/unconventionality. Ensure risk-tolerant seed funding for unconventional research either by

keeping success rates high or by introducing an element of random selection.

- *Clearer criteria:* Consider clearer guidelines on the review criteria ‘unconventionality’ and ‘originality’, and possibly merge them into one criterion. Clarify whether a proposal’s links to applicants’ ongoing or previous projects should count negatively. If links to an applicant’s other projects are to count negatively, make this clear to applicants and consider a *non-blinded pre-screening* of proposals to exclude those with links to applicant’s other projects.
- *Expertise for assessing unconventionality:* Enable more thorough assessments of unconventionality by ensuring to recruit two ‘within-specialization experts’ for each proposal (this was obtained for less than one third of the proposals in 2020), and so also give all proposals a more equally ‘tough’ assessment.
- *Keep administrative costs low:* Ensure that the costs of administering the funding instrument are proportionate to the small size of the grants. More adequate ICT tools should be a help in this.

1 Introduction

1.1 The Spark Pilot

In 2019 the SNSF initiated a pilot for a funding instrument to enable rapid funding of unconventional research ideas. The primary purpose was to fund unconventional ideas, with minimal reliance on preliminary data, that were unlikely to be funded under other funding schemes. This included the rapid testing or development of new scientific approaches, methods, theories, standards and ideas.

For this, new review procedures were implemented, with blinded review of all proposals, i.e. the proposals were assessed based on the project description only – reviewers were not given any information about the identity, background or institutions of the applicants.

Calls for proposals were announced in 2019 and 2020, open to all fields of research, and a total of 376 Spark projects have been funded (38% of 720 proposals in 2019; 12% of 868 proposals in 2020).¹ The instrument was aimed at smaller projects and provided flexible funding. Different from the SNSF's major instruments Project funding, Spark funding could be used for covering the applicant's own salary. Between CHF 50,000 and CHF 100,000 funding was awarded to each project – normally for a period of 6 to 12 months, and 24 months maximum. In this way, the instrument was open to all researchers at Swiss research institutions,² regardless of field or career stage.³

Two reviewers from a pool of international experts were assigned to each (anonymous) proposal and asked to rate it on four criteria: 'Originality/Novelty of the proposed project', 'Unconventionality of the idea', 'Scientific quality of the proposed project'; and 'Potential for significant impact', all rated on a 4-point scale: A: Very high; B: High; C: Moderate; D: Low. Funding decisions were then made based on the two assessments (without any expert meeting to discuss or adjust scores),

¹ Note that all figures on Spark proposals in this report do not include proposals from 43 applicants who did not agree to share information with NIFU, see Section 1.5.

² Projects were to be conducted at a Swiss research institution, but also applicants not employed at a Swiss institution could apply, provided they had the support from an eligible institution to conduct the research.

³ I.e., career stage after PhD. A PhD or similar was required to apply.

so that proposals with top scores from both reviewers would first be approved, then the ones with one top score and one second best score, and so on.

Because the Spark budget and success rate was substantially lower in 2020 than in 2019,⁴ there is a notable difference in the score profiles of the approved proposals. In 2019, all proposals scored top by one of the reviewers were funded (AA, AB, AC or AD). In 2020, only proposals rated top by both reviewers, or top by one and second best by the other were funded (AA, AB). Additionally, to be funded in 2020, those with overall grade AB also needed high scores on the review criteria ‘originality’ and ‘unconventionality’.⁵

This report provides an evaluation of the Spark pilot. The next section gives some background on research instruments for funding unconventional research ideas and double-blinded review. Section 1.3 and 1.4 outline the aims and questions and key concepts of the evaluation, and Section 1.5 gives an overview of the data and methods applied.

1.2 Background and previous studies

Research funding is essential to enable the conduct of research and to create infrastructure for doing research. Research funding comes in different forms and sizes depending on the goals it aims to support, and calls for research proposals may incentivize e.g. collaborative, innovative and transformative research and be an important tool for implementing research policy.

Funding unconventional research ideas and diversity

Supporting unconventional research ideas may involve research going against the major perceptions and address certain ‘blind spots’ within a field, research that ties together fields with no preliminary interaction, uncertainty concerning expected results as well as how to reach the goals, involving much trial and error (Laudel and Glaser 2014). Flexible funding, for example from institutions with an explicit aim to fund high-risk research, has been found important to achieve this, giving researchers the necessary leeway for experimenting and addressing

⁴ The original budget was the same in the two years, but in 2019 the overall financial situation of the SNSF allowed a topping-up of the budget in face of the very high demand.

⁵ Proposals with the following grades were approved: overall grade AA, or overall grade AB plus at least three As on the review criteria Originality and Unconventionality (and no lower grade than B on these two criteria), or overall grade AB and two As on the review criteria Originality and Unconventionality and no lower grade than B on any of the four review criteria. The 2020 regulations said: ‘Proposals are categorised into different funding priorities, based on the two assessments obtained for each proposal’. ‘If it is not possible to fund all applications that have the same funding priority, preference will be given to applications with a higher score for the criteria “Originality, novelty of idea” and “Unconventionality of proposed research”.’ No such procedure was defined in the regulations for the 2019 call.

new problems and ideas that come up along the way (Heinze et al. 2007; 2008). Furthermore, to support high-risk projects, decision-making processes that do not depend on consensus among the reviewers may be important. Rather, disagreement among reviewers may indicate unconventional research (Langfeldt 2001; 2006). Time is also an important factor. Research projects with a short time horizon may lead researchers to less ambitious problems and as such give more predictive results, compared with projects with longer time perspectives (Bourke and Butler 1999).

Different from long-term funding, The Spark instrument was designed for 'kick-starting' what could potentially develop into more transformative ground-breaking research, by supporting small-scale projects that demonstrate unconventional thinking. Spark had a design to underscore this aim as there is evidence that smaller research teams tend to disrupt science and technology with new ideas and opportunities, whereas larger teams tend to develop existing ones (Wu et al. 2019). Moreover, a researcher survey for the SNSF (Langfeldt et al. 2014) indicated that smaller grants with reduced application requirements increase flexibility, and open up for a more diverse group of applicants, such as younger researchers and those in lower academic positions, researchers with shorter research lines, researchers in the humanities and social sciences, as well as researchers at the Universities of Applied Sciences and Universities of Teacher Education. The researcher survey for the SNSF (Langfeldt et al. 2014) also indicated that more weight on project ideas compared with weight on past performance was perceived as an advantage by the younger and less established researchers. Hence, such design of funding instruments may be a strategy for promoting diversity in research.

Double blind review

An important component of the Spark pilot was the double-blind review process, in which the evaluators only focused on the proposed project idea, and not the identity and/or previous scientific merits of applicants. Reviewers were not asked to assess applicant's competence for the project. While this is common practice within traditional peer review for scientific publishing, it is an unusual strategy for grant selection processes, with some exceptions.⁶ One study, however with limited data,⁷ found that grant reviewers who evaluated short, anonymized proposals picked an almost entirely different set of projects compared with those chosen by reviewers presented with standard, full-length versions of the same proposals

⁶ For example, the Bright IDEAS Award in the UK, intending to support genuinely novel and potentially transformative research projects. Engineering and Physical Science Research Council: [Bright IDEAS Award: The Big Pitch - EPSRC website \(ukri.org\)](https://www.ukri.org/programmes/bright-ideas-award/) Last accessed 19.02.2021.

⁷ The experiment was not set up to study the effect of anonymity.

(Bhattacharjee 2012). Still, it is not clear if weight on project ideas increases the chances of funding blue sky/high-risk research, and the consequences of conducting double-blind review of grants have not been rigorously studied (Liaw et al. 2017). In the evaluation of the Spark pilot, we looked at the extent to which it managed to attract and fund original and unconventional research proposals, as well as the potential role of double-blind review process in this.

Blinding the identity of applicants from reviewers has also been studied as a mechanism for increasing the fairness of peer review systems. In the context of journal peer review, studies show that introduction of double-blind review increased the representation of female authors by 33% (Budden et al. 2008). In grant funding, gender gaps have been linked to less favourable assessments of women as principal investigators (Wittelman et al. 2019). There are also indications that peer review of grant applications at SNSF have been prone to biases as male applicants received more favourable evaluation scores than female applicants (Severin et al. 2020).⁸ In this report, we seek insights into if and eventually how an instrument such as Spark, with a blind review process, may be helpful to promote diversity and gender equality in research.

1.3 Aim of the evaluation

A main question for this evaluation is to what extent the Spark pilot reached its goals. Here, we have differed between explicitly stated goals for the Spark instrument, as stated in the description and regulations of Spark,⁹ and what appear to be more implied goals of Spark ‘written between the lines’ in the same documents, as well as how Spark is described by the SNSF Administrative Office (group interview).

The explicitly stated goals of Spark were:

- to fund the rapid testing or development of new scientific approaches, methods, theories, standards, ideas for application
- to support unconventional and original research ideas or projects, with focus on research that is unlikely to be funded under other funding schemes

Further, we interpret the implied goals of Spark as being:

- a funding possibility and unique career opportunity for younger researchers in temporary positions. This because Spark – different from most other SNSF instruments – was open to any applicant with a

⁸ Analysis of the most recent SNSF calls indicates however no significant gender differences (SNSF Gender Newsletter No 2, December 2021).

⁹ SNSF (2019) Regulations on the Spark funding scheme; SNSF (2020) Spark regulations; SNSF (2020) Spark Pilot Evaluation invitation to tender; SNSF (2021) Spark general information, retrieved from [Spark \(snf.ch\)](https://www.snf.ch)

doctorate or equivalent qualifications (minimum three years of research experience as main source of income), it covered applicants' salary, and not least because assessments and funding was not to rely on candidates' track record (proposals were anonymous). This gave less experienced researchers a chance to compete with the more experienced.

- an experiment to test out new modes of review, such as the effect of double-blind review, and possible connections between contradictory reviews and unconventionality
- to fill a perceived need for less 'risk-averse' funding and provide seed funding to start new projects.

The report addresses the strengths and weaknesses of the Spark pilot in reaching these aims. It is furthermore to provide the SNSF with recommendations on how Spark eventually could be set up in the SNSF funding portfolio from 2022 to best serve its goal. In the following, we give a description of our approaches and methods. First, we address some key concepts.

1.4 Definitions of key concepts

Key concepts for this evaluation are unconventional research and high-risk/high impact research. Both are ambiguous terms and may be interpreted in multiple ways.

Unconventional research

In the Spark guidelines for the reviewers, 'unconventionality' and 'originality/novelty' were separate review criteria. Still, they were defined much along the same lines, and unconventionality was partly defined as an extension of originality/novelty – in addition to being new and original, it should be unique to be unconventional. Moreover, the guidelines on assessing unconventionality were more about the thinking and ideas behind the project, while for originality/novelty it was more about the starting point of the proposed research project as a whole:

‘Originality/Novelty of the proposed project.

Indicate to which extent the starting point or theoretical/methodological approach chosen for the proposed project is original and/or new. Indicators of originality and novelty maybe a lack of existing projects, literature or other scientific output on the topic. The use of databases and search engines, such as dimensions.ai, Scopus, Google Scholar, etc., is permitted to search for similar research, if applicable.’

‘Unconventionality of the idea.

Indicate the extent to which, in addition to being original, the idea of the proposed project shows unconventional thinking and introduces a unique approach or hypothesis, and/or a non-standard methodology, or similar.’

Spark reviewer guidelines 2019 and 2020.

In an attempt to make the distinction between original and unconventional clearer, when we surveyed the experts who had reviewed the Spark proposals about how Spark policies and review procedures supported unconventional and original research, we specified ‘unconventional research’ as ‘research ideas with limited basis in previous research (i.e. unconventional research)’. Apart from this we have not defined ‘unconventional research’ in the surveys, but let the term be up to the respondents to interpret – and comment on (which they did).

High-risk/high impact research

Funding ‘High-risk/high impact research’ was another aim of Spark. It was not a defined review criterion, but review guidelines emphasized that ‘A lack of preliminary data or the riskiness of a research project shall not negatively affect an evaluation, as these aspects are explicitly encouraged for this funding scheme.’

In the questionnaires used to collect data for this report, ‘High-risk/high impact research’ were defined as ‘research ideas with a high probability of failure to get any significant results, but with a possible high impact on future research if successful.’

1.5 Data and methods

The evaluation applies a mixed methods approach, combining multiple sources of both quantitative and qualitative data:

- Background documents
- Data on proposals, applicants and reviews
- Survey of the researchers who submitted Spark proposals
- Survey of the experts who reviewed the Spark proposals
- Interviews with Spark stakeholders

Each of the data sources are described below.

Background documents

Background documents for the analyses included the Spark regulations and other preparatory documents for the Spark calls for proposals and reviewer guidelines. The SNSF also provided NIFU with examples of Spark research plans and qualification statements. Moreover, we draw on analyses of the Spark pilot performed by the SNSF data team:

- Rachel Heyard & Anne Jorstad (2021). Learnings from Spark. Descriptives, Statistical Models and Gender Effects.
- SNSF data team (2019). Exploratory figures on the Project Spark.
- SNSF data team (2020). Project Spark: Gender effect and interactions Statistical modelling.
- SNSF data team (2020). Gender and the use of positive language. Textual analysis on Spark applications.

Proposal, applicant and review data

Extensive quantitative data were provided by the SNSF for the analysis of Spark proposals, applicants, expert pool and reviews/rates and outcome:

- *Data on 1588 Spark proposals* (not including proposals from 43 applicants who declined to share information about their proposal with NIFU): approved or not; amount requested and granted; amount applied for own salary; institution; field and discipline; abstract and keywords.
- *Data on Spark applicants* (720 main applicants and 190 co-applicants in 2019; 868 main applicants in 2020): name and email; gender; age; position (type of professorship; function in project; permanent, fixed or no contract); nationality; doctorate country; previous SNSF grants.
- *Data on 1225 expert reviewers*: Name and email; gender; incomplete data on country.
- *Data on 2991 reviews*: Grades on four criteria, overall grade and review comments, reviewer's proximity to the application topic (as indicated by the reviewer, for the 2020 call only); method for matching experts to proposals (manual or algorithm). In total 1496 proposals with reviews (all but

one with two reviews, the one with one review was a proposal which was withdrawn during the review process). The remaining proposals did not pass the formal pre-check or were withdrawn before review.

- *Data on outputs of funded and completed projects:* Publications, collaborations and other outputs.

In the 2020 Spark call, there were technical difficulties with the anonymization of some of the project descriptions, and 255 applicants who were originally not considered due to insufficient anonymization, were invited to resubmit a correctly anonymised proposal to an extra call with deadline in June 2020. Hence, the data set studied consists of three Spark calls: July 2019 (720 proposals), March 2020 (613 proposals) and June 2020 (255 proposals).

For comparison, aggregated data on two other SNSF instruments – SNSF Project funding and Postdoc.Mobility – for 2019 and 2020 were provided:

- On SNSF Project funding:
 - Proposals and success rates by field, type of institution, gender, age, position (type of professorship and function in project), nationality and doctorate country.
 - Reviewer proximity to application topic by field.
- On Postdoc.Mobility:
 - Proposals and success rates by field, gender, age and nationality.
 - Reviewer proximity to application topic by field. (i.e. for the minority of proposals which were sent to external reviewers).

Moreover, the SNSF also provided detailed descriptions of their procedures for the Spark Pilot, and for SNSF Project funding and Postdoc.Mobility (for pre-check of formal requirements/eligibility, expert search and selection, review and selection process; administration of funded projects and procedures), time and personnel costs for these three funding instruments, as well as aggregated data on complaints from applicants in the three schemes (in 2019 and 2020).

Applicant survey

We distributed a short survey to all Spark applicants to gain insights into applicants' opinions and use of the instrument. The survey included questions on the particular Spark application, whether Spark funding primarily contributed to/differed from their main line of research, and their other (attempts at) funding for the project; experiences related to the application process (time and resources); and the framework conditions and aims of Spark. The applicants were also asked to compare their experiences with Spark with their experiences with other relevant funding schemes. In addition, we included open-ended responses to enable the respondents to substantiate their experiences and views.

The survey invited all main applicants in both Spark calls (except the 43 who opted out of sharing information with NIFU, see above section on the proposal data): in total 1588 main applicants. The survey invitation was sent by email to the applicants on 29 June 2021. The survey was open until 8 September 2021 and in this period the applicants who had not responded received three reminders. In total, 870 applicants responded to the survey leading to a response rate of 55%. However, 69 applicant emails were no longer valid and, as they did not receive the survey, these are excluded from the sample. As a result, the total sample consists of 1519 applicants, which leads to a response rate of 57%. Furthermore, when we compare the total sample to the sample of those who responded to the survey, in terms of distribution across relevant background variables (call, field of research, gender, age, type of home institution and application outcome), we find similar distributions across the variables which indicates that we have a representative sample of respondents. The only variable where the two samples differ is the share of proposals that were approved. A higher share of our respondents (36 %) got their proposal approved compared with the total sample (24 %).

Tables 1.1 and 1.2 show the response rate by call year and application outcome. The response rate is about the same for the 2019 and 2020 Spark calls. However, table 1.2 shows that a substantially higher share of main applicants with an awarded proposal answered the survey.

Table 1.1 Response rate by call year.

Call year	% Response		N Response	
	2019	2020	2019	2020
Response	58.4	56.3	399	471

Table 1.2 Response rate by application outcome.

Application outcome	% Response		N Response	
	Not awarded	Awarded	Not awarded	Awarded
Response	48.6	84.3	559	311

The high response rate in the smaller group of awarded applicants, allow us to do differentiated analysis also within this group (of 311 respondents). Still, the lower response rates for the non-funded than for the funded applicants, imply a bias in the sample. Researchers tend to be far more positive about the schemes that funded their research than about schemes that did not. In the analyses we handle this by separate analyses of replies from funded and non-funded applicants. We also draw on other data (proposal data, reviewer survey and interviews with stakeholders) when relevant.

Reviewer survey

Many reviewers have been involved in the evaluation process and to get their views we developed a short survey and distributed it to all reviewers in both calls. The survey contained questions on the adequacy and comprehensibility of guidelines and criteria, the doubled-blinded process, reviewing one application vs multiple and timeline for the selection process, review time compared with other schemes, as well as their overall opinion of the review process and possible improvements. We also asked the reviewers to compare with their experiences of other grant review processes.

The survey was distributed by email to all 1225 reviewers on 7 July 2021. A few days before this, all reviewers received a pre-survey notice from the SNSF which included a letter of recommendation from the SNSF. The survey was open until 9 September 2021. In this period those who had not responded to the survey received three reminders. In total, 711 reviewers responded to the survey which resulted in a response rate of 58%. However, 39 reviewers had emails that were no longer valid, and these are therefore excluded from the sample. This leads to a response rate of 60%. To evaluate representativeness, we have compared the distribution across available background variables (gender, review year, how reviews were assigned and number of reviews) for the total sample compared with those who responded to the survey. There are some differences between these two samples. A slightly lower percentage of reviewers who reviewed proposals only in 2019 answered the survey. Moreover, those who answered the survey seem to have done a higher average of reviews compared with the average of the total sample.

Table 1.3 and 1.4 show the response rate by review year and if the reviewer did one review or more than one review. From the tables we can see that the response rate is substantially higher for those who reviewed both years and for the reviewers who did more than one review. Moreover, a large majority (73.5%) of those who did more than one review also reviewed in both years, which means that the two categories mostly consist of the same reviewers.

Table 1.3 Response rate by review year.

Review year	% Response			N Response		
	2019	2020	2019 & 2020	2019	2020	2019 & 2020
Response	53.0	58.3	74.9	176	368	167

Table 1.4 Response rate by Spark reviews.

Spark reviews	% Response		N Response	
	1 Review	More than one review	1 Review	More than one review
Response	55.4	73.0	487	224

Interviews with stakeholders

The surveys have been complemented by interviews to get in-depth accounts of experiences with and views on the Spark funding instrument, including their thoughts about the double-blind review, the overall framework conditions, and the instrument's role in the Swiss funding landscape. All interviews have been semi-structured and conducted via video link. The interviews lasted for 20–80 minutes. We have interviewed the following groups of stakeholders:

- Head of labs/departments
- Members of the SNSF Research Council (division 1–4)
- Key informants within the SNSF Administrative Office (group interview)

Many of the interviewees had several roles, e.g. they were both head of a lab/department and member of the Research Council and some were Spark applicants themselves. Thus, we asked them to draw on all these roles when reflecting upon the Spark instrument.

To get more insight into the administrative efforts in Spark, we conducted a group interview with a selection of four people from the SNSF Administrative Office. The interviewees had 4–6 years of experience within the SNSF and had all been involved with Spark in different ways, some with main responsibility for finalizing it and putting up the call, others taking care of email correspondence, supervising pre-check etc., changing the regulations between the calls, budget questions and so on. Some interviewees were on board from the very start, others joined in later.

In total, we conducted interviews with 13 people. These were recruited from a list provided by the SNSF administration. We sought to recruit a diverse group of interviewees, in respect of gender, research field and type of institution. Still, the interviews do not necessarily give the full picture of opinions about the Spark funding instrument from lab/department heads and members of the Research Council. Rather, they aim to supplement findings from our surveys, giving more in-depth descriptions of views and opinions.

All interviewees received an email invitation to participate in the project. Here, we explained the main goals of the evaluation, provided relevant background information (including GDPR rights), and attached a support letter from the President of the National Research Council SNSF.

The interviews were recorded and analyzed thematically, with focus on Spark's attractivity and target group, the double-blind review process, Spark in the Swiss funding landscape, and the future of Spark.

All interviewees were informed about their GDPR rights, and were asked for their consent to participate; we asked for permission to record the interviews and to include their names in the list of interviewees in an appendix to the evaluation report. In the report, the information from the interviews is anonymized, and we only give information about positions and research fields when it is relevant for understanding the context.

2 Attractiveness and outreach

A main focus of this evaluation is to investigate to what extent Spark managed to attract and fund the best suited applicants and the intended projects. For a call for research proposals to succeed, it is essential that it reaches out to its target groups and attracts the most competent and promising researchers to participate. Thus, the call for proposal needs to present the funding scheme as attractive to the target group; it has to be clear and easy to understand without any unforeseen bias concerning who finds the scheme attractive or has the opportunity to apply.

2.1 Project outreach – Characteristics of Spark proposals and funded projects

Fields and institutions reached

The majority of the applicants – regardless of their institutional affiliation – had not previously obtained a grant from the SNSF. Of the 1588 proposals, 1042 (66%) had a main applicant with no previous SNSF grant. 73% of the applicants from the ETH domain¹⁰ and 74% from the Universities of Applied Sciences had not previously obtained a grant from the SNSF. The Universities of Teacher Education, which appear with the lowest number of Spark proposals, have the lowest proportion of applicants without previous SNSF grants, while Cantonal universities which appear with the highest number of Spark proposals have the highest proportion of applicants with more than one previous SNSF grant (table below). Those with previous SNSF grants had a somewhat higher success rate in the 2019 Spark Call, and slightly lower in 2020. Still, in both years a large majority of the funded applicants had no previous SNSF grants. In total 230 (of 376) Spark grants were awarded to applicants with no previous SNSF grants (Table A 15 in Appendix 1).

¹⁰ The ETH domain consists of two federal universities (ETH Zürich and EPF Lausanne) and four research institutes (Eawag, WSL, Empa and PSI).

Table 2.1 Spark proposals 2019 and 2020 by the applicant’s institutional affiliation and previous SNSF grants. Percentages.

Type of institution	Applicant’s previous SNSF grants			Total
	0	1	More than 1	
Cantonal university	60.0 %	15.6 %	24.4 %	845
ETH Domain	73.0 %	10.3 %	16.7 %	389
University of Applied Sciences	73.6 %	11.7 %	14.7 %	273
University of Teacher Education	58.8 %	23.5 %	17.6 %	17
Other*	62.5 %	18.8 %	18.8 %	64
Total	65.6 %	13.9 %	20.5 %	1588

Source: Data provided by the SNSF.

* ‘Other’ includes i.a. research institutes outside the ETH domain, hospitals, other types of higher education institutions, industry, libraries, museums and foundations.

More proposals from Universities of Applied Sciences, while proposals from the ETH domain had the highest success rate. Comparing the Spark proposal profile with the profile of SNSF Project funding – the major regular grants scheme of the SNSF – we see that a considerably higher proportion of the proposals came from Universities of Applied Sciences. However, the proposals from the Universities of Applied Sciences had lower success rate both in Spark and in SNSF Project funding. We also see that proposals from the ETH domain had a particularly high success rate in 2019 (20 percentage points higher than Universities of Applied Sciences, tables below). The higher proportion of the proposals from Universities of Applied Sciences is significant both years, and appears as a notable difference of the outreach of the Spark instrument compared with Project funding.

Table 2.2 Applications by type of institution, Spark vs SNSF project Funding 2019 and 2020.

Year	Type of institution	Project funding		Spark	
		N Pro- posals	% proposals by inst type	N Pro- posals	% pro- posals by inst type
2019	Cantonal university	1127	62.1	378	54.6
	ETH Domain	416	22.9	182	20.7
	Other	99	5.5	31	4.3
	University of Applied Sciences	138	7.6	118	18.7
	University of Teacher Education	36	2.0	11	1.8
	Total	1816	100.0	720	100.0
2020	Cantonal university	1167	61.2	467	54.1
	ETH Domain	474	24.9	207	22.9
	Other	82	4.3	33	3.7
	University of Applied Sciences	157	8.2	155	18.6
	University of Teacher Education	26	1.4	6	0.7
	Total	1906	100.0	868	100.0

Source: Spark Data provided by the SNSF and aggregated data on Project funding by the SNSF Data Team.

Table 2.3 Success rates by type of institution, Spark vs SNSF project Funding 2019 and 2020.

Year	Type of Institution	Project funding		Spark	
		N Pro- posals	Success rate %	N Pro- posals	Success rate %
2019	Cantonal university	1127	46.2	378	35.7 %
	ETH Domain	416	48.8	182	49.5 %
	Other	99	43.4	31	38.7 %
	University of Applied Sciences	138	33.3	118	29.7 %
	University of Teacher Education	36	36.1	11	27.3 %
	Sum	1816	45.5	720	38.2 %
2020	Cantonal university	1167	38.6	467	11.1 %
	ETH Domain	474	36.9	207	15.0 %
	Other	82	26.8	33	15.2 %
	University of Applied Sciences	157	21.0	155	7.7 %
	University of Teacher Education	26	30.8	6	16.7 %
	Sum	1906	36.1	868	11.6 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding by the SNSF Data Team.

Variation by field of research: Further comparative analyses show that in both years, the life sciences had a higher percentage of the Spark proposals than of proposals to SNSF Project funding and SNSF Postdoc.Mobility. Compared with other Spark applicants, the life sciences applicants more often came from the Cantonal universities and were group leaders/senior physicians, and less often applied for their own salary.¹¹ We also see that proposals within STEM fields (science, technology, engineering and mathematics) had a substantially higher success rate within Spark, whereas there were only small field differences in success rates in SNSF Project funding and Postdoc.Mobility (tables below).

¹¹ In the life sciences, 71% of applicants came from the Cantonal universities (compared with 27% in STEM fields and 55% in SSH), 27% were group leaders/senior physicians (compared with 18% in STEM fields and 14% in SSH), and 46 % applied for their own salary (compared with 68% in STEM fields and 69% in SSH).

Table 2.4 Applications by field of research, Spark vs SNSF project Funding and Postdoc. Mobility 2019 and 2020.

Year	Main Discipline	Project funding		Postdoc.Mobility		Spark	
		N proposals	% proposals by field	N proposals	% proposals by field	N proposals	% proposals by field
2019	Biology and Medicine	684	37.7	340	35.2	286	40.0
	Math., Nat.Engin. Sciences	584	32.2	335	34.7	225	30.6
	Social Sci. and Hum.	548	30.2	291	30.1	209	29.4
	Total	1816	100.0	966	100.0	720	100.0
2020	Biology and Medicine	676	35.5	327	32.2	361	42.0
	Math., Nat.Engin. Sciences	643	33.7	375	37.0	251	28.2
	Social Sci. and Hum.	587	30.8	312	30.8	256	29.9
	Total	1906	100.0	1014	100.0	868	100.0
Total	Biology and Medicine	1360	36.5	667	33.7	647	41.3
	Math., Nat.Engin. Sciences	1227	33.0	710	35.9	476	29.0
	Social Sci. and Hum.	1135	30.5	603	30.5	465	29.7
	Total	3722	100.0	1980	100.0	1588	100.0

Source: Spark Data provided by the SNSF and aggregated data on Project funding and Postdoc.Mobility by the SNSF Data Team.

Table 2.5 Success rates by field of research, Spark vs SNSF project Funding and Postdoc. Mobility 2019 and 2020.

Year	Main Discipline	Project funding		Postdoc. Mobility		Spark	
		N proposals	Success rate %	N proposals	Success rate %	N proposals	Success rate %
2019	Biology and Medicine	684	46.5	340	51.2	286	37.8
	Math., Nat. & Engin. Sciences	584	46.4	335	52.8	225	39.6
	Social Sci. and Hum.	548	43.2	291	48.5	209	37.3
	Total	1816	45.5	966	50.9	720	38.2
2020	Biology and Medicine	676	36.7	327	43.7	361	10.8
	Math., Nat. & Engin. Sciences	643	34.4	375	43.2	251	13.9
	Social Sci. and Hum.	587	37.5	312	41.0	256	10.5
	Total	1906	36.1	1014	42.7	868	11.6
Total	Biology and Medicine	1360	41.6	667	47.5	647	22.7
	Math., Nat. & Engin. Sciences	1227	40.1	710	47.7	476	26.1
	Social Sci. and Hum.	1135	40.3	603	44.6	465	22.6
	Total	3722	40.7	1980	46.7	1588	23.7

Source: Spark Data provided by the SNSF and aggregated data on Project funding and Postdoc.Mobility by the SNSF Data Team.

Novelty and urgency

Similar profile of submitted proposals both years. Analyzing the grades obtained on originality and unconventionality we find little difference between the two years (Figure 2.1 and 2.2). Hence, in terms of assessed originality and unconventionality the portfolio of submitted proposals appear very similar the two years.

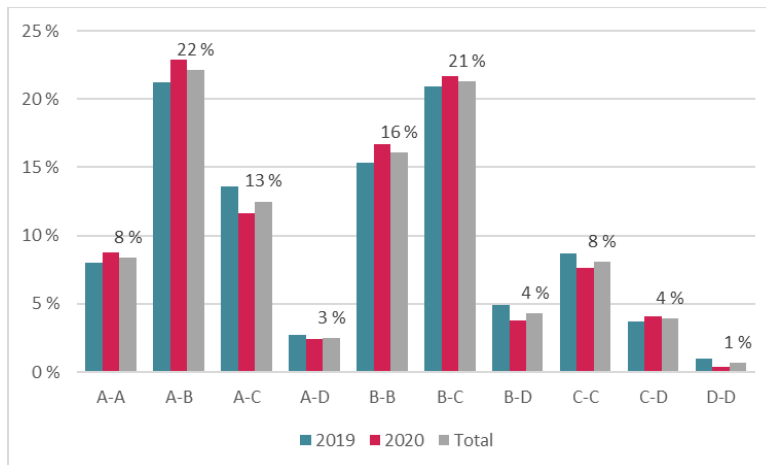


Figure 2.1 Spark proposals by year and grades on originality. Percentages.

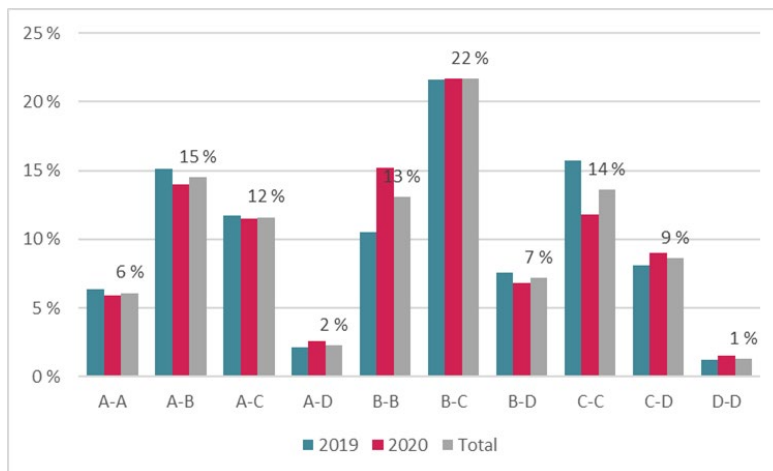


Figure 2.2 Spark proposals by year and grades on unconventionality. Percentages.

Less diversity in the originality and unconventionality grades of funded projects in 2020. As a result of the different success rates and grades needed for approval of proposal in the two years (Figure 2.3), funded projects' grades on originality and unconventionality are very different over the two years. In 2019, 17% of funded proposals were rated A on originality by both reviewers (AA), while in 2020, 53% were rated AA. Similarly, for unconventionality, a much higher percentage of the funded proposals were rated AA in 2020 than in 2019 (14% in 2019 and 33% in 2020, Figure 2.4).

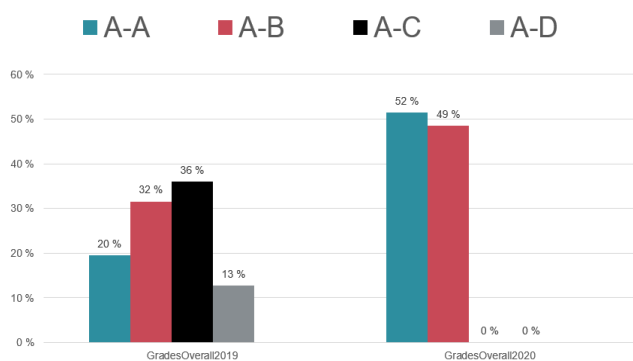


Figure 2.3 Funded Spark proposal 2019 and 2020 by overall grades. Percentages.

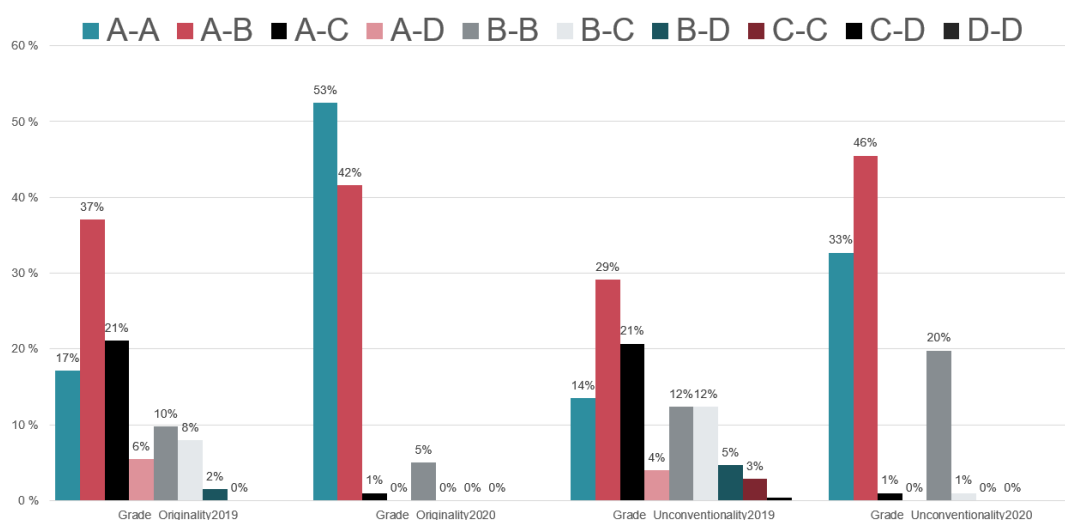


Figure 2.4 Funded Spark proposals 2019 and 2020 by grades on originality and unconventionality. Percentages.

Compared with applicants' other projects, the Spark projects were more often based on novel or risky ideas. In the survey we asked the respondents how their Spark application differed from other projects they had applied for. 82% of the respondents indicated that their Spark proposal was to a larger extent based on novel and/or unconventional ideas than other projects they had applied for. Similarly, 60% indicated that their proposal was more based on a risky idea with significant chance of a failure (table below). Yet, this was less common among junior researchers and more common among those whose proposal had been approved. While 87% of researchers¹² indicated that their Spark proposal was more based

¹² 'Researchers' here include all categories of positions except junior researchers and leadership positions (i.e. not group leader, head of institute, department or similar).

on a novel and unconventional idea, 79% of junior¹³ researchers did so.¹⁴ Similarly, 75% of the applicants with approved proposals indicated that their applications were to a larger extent based on a risky idea than other projects they had applied for, while 51% of those without approved proposals answer the same.¹⁵ Those with a temporary position more often than those with a permanent position identified their Spark project as riskier and with more urgency for funding (both in terms of retaining research opportunities and talent) than their other projects (figures in Appendix 5, Question 3).

Table 2.6 Proposed Spark projects compared with applicant’s other projects. Spark applicants 2019 and 2020. Percentages.

Compared to your other research what characterized the Spark project you applied for?	Spark more so	No difference	Spark less so	Cannot say	N
It was based on novel and/or unconventional ideas, perspectives or methods	82	13	2	2	842
It was based on a risky idea with significant chance of failure	60	27	6	7	839
Urgency of funding: Research opportunities would get lost if waiting	38	34	16	12	833
I was confident that I would get positive results	37	36	13	14	837
Urgency of funding: Research talent would get lost if waiting	31	33	18	17	825

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

Spark projects differed from other projects in multiple ways. There was an open field in the questionnaire to explain how the proposed Spark project differed from the applicant’s other research. Here it was frequently commented that the project was in another field or topic than their other research, a field in which they had no/limited CV, or that it was more interdisciplinary, more fundamental or more applied than their other research. Some explained that it differed by being their own idea and was to be independent research. Others commented that the Spark project was smaller and speedier – to be done in one year only – or that it did not differ from their previous projects. Below are a few examples of the comments:

- *This was not so much about basic research as SNF wants, but about a technological development, yet too basic for InnoSuisse. (Spark applicant 2019, funded)*
- *My other projects are industry-related with a focus on practical applications. The SPARK project allowed me to step back and conduct fundamental research, combining my [applied] experience [...] with my background as a [...] physicist. (Spark applicant 2019, funded)*

¹³ ‘Junior researchers’ include postdocs, research associates and resident physicians, as well as a few PhD students.

¹⁴ No similar difference between researchers and junior researchers were found for ‘It was based on a risky idea with significant chance of failure’ (57% of junior researchers and 60% of researchers indicated that their spark proposals was more so).

¹⁵ Those with approved proposals also somewhat more often indicated that their Spark proposal was more based on novel and/or unconventional ideas, perspectives or methods than other projects they had applied for (88% of approved and 78% of non-approved applicants indicated so).

- *It was an opportunity to start working on something new. I needed to switch topics for Habilitation. (Spark applicant 2019, not funded)*
- *To be honest, my Spark proposal does not seem to differ from what I tried before, or am trying now. I do aim for unconventional, and indeed I was so far successful only with the Spark. (Spark applicant 2019, funded)*
- *The project for the Spark proposal was based on research I had already been conducting. However, as I was employed only part time by my host institution, I was lacking enough time and financial resources to pursue the project to the fullest extent. Hence my applying for a Spark grant as a way of adding resources to the pursuit of the project. (Spark applicant 2020, funded)*

The reviewers often did not find Spark projects different from other projects, but some were more risky or unconventional. Turning to the survey of the reviewers, we see that about one third replied that the Spark proposals were more unconventional or more high-risk/high impact than other proposals they had reviewed, while the majority replied that they did not differ substantially or were less unconventional/high-risk (table below).

Urgency of projects varied. For the urgency of funding the projects, the reviewers saw little difference from other projects (45%) or they could not answer (28% could not remember/could not say or had no comparative basis). 17% of the reviewers indicated that the Spark projects were more urgent, while 11% indicated that they were less urgent (table below). However, turning to the replies from the applicants, we find higher proportions indicating that their Spark projects were more urgent than their other projects. 38% replied that research opportunities would get lost if waiting, and 31% that research talent would get lost if waiting (table above). There is no significant difference between funded and non-funded applicants in these urgency questions. There is however a significant difference between applicants in permanent and temporary positions: Applicants in temporary positions more often indicated that research opportunities and talent would get lost if waiting (table in Appendix 5, Question 3).

Table 2.7 Proposed Spark projects compared with reviewer’s other grant reviewed. Percentages.

Compared to other grant proposals you have reviewed, what characterized the Spark project(s) you reviewed?	The spark proposal(s)			Cannot remember/ Cannot say	Not appl**	N
	was/were less so	did not differ substantially	was/were more so			
a) The project ideas were well prepared and clearly described	14	59	13	10	3	674
b) Urgency of funding: Research opportunities would get lost if rapid funding was not provided	11	45	17	22	6	668
c) The project description(s) contained unconventional research ideas, perspectives and/or methods	10	44	32	10	4	669
d) The research questions were clearly linked to an existing line of research	14	60	12	11	4	669
e) The proposed research involved multiple disciplines of research	14	51	15	16	4	671
f) The projects aimed at testing high-risk/high impact research ideas*	11	43	30	12	4	670

Source: NIFU survey in 2021 to the reviewers of Spark proposals (2019 and 2020 Spark calls).

*I.e. research ideas with a high probability of failure to get any significant results, but with a possible high impact on future research if successful.

**Not applicable, I have not reviewed proposals for other funding schemes.

2.2 Applicant characteristics and success rates

Profile and success rates of Spark applicants

Co-applicants were more senior: Whereas the 2020 call did not allow more than one applicant per proposal, in 2019 there were no restrictions on the number of applicants.¹⁶ 155 of the submitted proposals in 2019 had more than one applicant (i.e. one or more co-applicants in addition to the main applicant¹⁷). In total, there were 190 co-applicants (most often one or two co-applicants per proposal, in five cases three to five co-applicants). Compared with the main applicants, these co-applicants were older, more often in the life sciences, had a permanent position and were full professors. Tables (A1–A10) in Appendix 1 give an overview of main and co-applicants by applicants’ gender, age, and position and field of proposal and whether the proposal included salary for the applicants. For comparability between years and funding schemes this section focuses on the main applicants.

Higher proportion of female applicants compared with SNSF Project funding and Postdoc.Mobility, but lower success rates. Compared with SNSF Project funding, Spark attracted a larger proportion of female applicants. Taking the two years together, 36% of Spark applicants and 26% of Project funding applicants were female. The proportion of female Spark applicants increased from 32% in 2019 to 39% in 2020, and in 2020 were close to the proportion of female applicants in Postdoc.Mobility (42%, Table A 16 in Appendix 1). Still, we see that while women had

¹⁶ For 2020, applicants could list persons and institutions with whom they would be collaborating for the project, but these did not have the status as co-applicants.

¹⁷ In SNSF terminology they are ‘responsible’ applicants.

significantly lower success rates than men when applying for Spark (20% vs 26% taking the two years together¹⁸), this was not the case in the two other funding schemes. In Postdoc.Mobility the success rate for women was slightly higher than for men. In Project funding there was no gender difference in success rates. Yet, there is a notable difference between the two years: While there is a gap of 9 percentage points between male and female Spark applicants in 2019, in 2020 with a higher share of female applicants and lower overall success rate, the gender gap is only 1 percentage point, and not significant (table below).

Table 2.8 Success rates by gender, Spark vs SNSF Project funding and Postdoc. Mobility 2019 and 2020.

Year	Gender	Project funding		Postdoc.Mobility		Spark*	
		N pro- posals	Success rate %	N pro- posals	Success rate %	N pro- posals	Success rate %
2019	Female	489	45.2	377	51.2	230	32.2 %
	Male	1327	45.6	589	50.8	490	41.0 %
	Total	1816	45.5	966	50.9	720	38.2 %
2020	Female	489	36.2	422	45.5	335	11.0 %
	Male	1417	36.1	592	40.7	533	12.0 %
	Total	1906	36.1	1014	42.7	868	11.6 %
Total	Female	978	40.7	799	48.2	565	19.6 %
	Male	2744	40.7	1181	45.7	1023	25.9 %
	Total	3722	40.7	1980	46.7	1588	23.7 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding and Postdoc.Mobility by the SNSF Data Team.

*Numbers differ from those in Heyard and Jorstad (2021) as the sampling criteria differ. We have included all submitted proposals in the analysis, also those also which were considered non-eligible/not sent to review and those which were withdrawn by the applicant. While as explained in Section 1.5, our analyses do not include proposals from 43 applicants who declined to share information about their proposal with NIFU.

Younger applicants had a higher success rate. The age profile of the Spark applicants was in between Project funding and Postdoc.Mobility: there was a lower proportion of applicants above 50 in Spark than in SNSF Project funding (13% vs. 41%), and a lower proportion of applicants below 40 in Spark than in Postdoc.Mobility (58% vs. 97%, Table A 17 in Appendix 1). Looking at success rates by applicants' age, we see that Spark resembles Postdoc.Mobility with higher success rates for applicants below 40 years old, while for Project funding there is little difference in success rates by age. For Spark we also note large differences between years in which age groups were most successful. The (small number of) applicants below 30 were by far the most successful in 2020, while in 2019 they were less successful (table below).¹⁹

¹⁸ In 2019, gender differences remain significant when controlled for other variables, while the differences in 2020 are not significant. See Table A11 and A13 in Appendix 1 and the section 'Different success factors in 2019 and 2020 (regression analyses)' below.

¹⁹ When controlled for other variables, age was a significant success factor in the 2020 Spark call, not in 2019. See Table A11 and A13 in Appendix 1

Tabell 2.9 Success rates by age, Spark vs SNSF project Funding and Postdoc.Mobility 2019 and 2020.

Year	Age	Project funding		Postdoc.Mobility		Spark	
		N pro- posals	Success rate %	N pro- posals	Success rate %	N pro- posals	Success rate %
2019	below 30	3	0.0	274	55.8	28	28.6 %
	30-39	323	47.4	661	50.2	392	41.3 %
	40-49	745	43.6	28	25.0	206	38.3 %
	50-59	611	46.6	3	0.0	80	30.0 %
	60+	134	47.0	0		14	14.3 %
	Total	1816	45.5	966	50.9	720	38.2 %
2020	below 30	1	0.0	321	47.0	28	25.0 %
	30-39	349	37.8	668	41.3	473	14.4 %
	40-49	793	35.8	25	24.0	262	6.9 %
	50-59	620	36.1	0		78	7.7 %
	60+	143	34.3	0		25	8.0 %
	Total	1906	36.1	1014	42.7	866	11.7 %
Total	below 30	4	0.0	595	51.1	56	26.8 %
	30-39	672	42.4	1329	45.7	865	26.6 %
	40-49	1538	39.6	53	24.5	468	20.7 %
	50-59	1231	41.3	3	0.0	158	19.0 %
	60+	277	40.4	0		39	10.3 %
	Total	3722	40.7	1980	46.7	1586	23.7 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding and Postdoc.Mobility by the SNSF Data Team.

Higher proportion of applicants without Swiss citizenship and lower success rates for those with Swiss citizenship. While 50% of the applicants for SNSF Project funding, and 62% of the applicants for Postdoc.Mobility did not have Swiss citizenship, we find that the Spark applicants were a bit more international as measured by citizenship: 67% of the Spark applicants did not have Swiss citizenship (in all three schemes there is little difference between the two years, Table A 18 in Appendix 1). Moreover, the ‘international’ Spark applicants had a significantly higher success rate (26%) than those with Swiss citizenship (20%).²⁰ This contrasts with Postdoc.Mobility where those with Swiss citizenship had a 5 percentage points higher success rate than ‘international’ applicants, and with SNSF Project funding where there were no significant differences (table below).

²⁰ The nationality of the Spark applicants correlates with other characteristics: The non-Swiss applicants were more often *young* (69% below 40 years old, compared with 36% among the Swiss), held a *junior position* (56% among the non-Swiss, compared with 27% among the Swiss), and *applied for their own salary* (63% among the non-Swiss, compared with 51% among the Swiss). Moreover, they were more often within *STEM fields* (33% among the non-Swiss, compared with 23% among the Swiss) and less often within the *SSH* (25% among the non-Swiss, compared with 37% among the Swiss).

Table 2.10 Success rates by nationality, Spark vs SNSF project Funding and Postdoc.Mobility 2019 and 2020.

Year	Nationality	Project funding		Postdoc.Mobility		Spark	
		N proposals	Success rate %	N proposals	Success rate %	N proposals	Success rate %
2019	Switzerland	915	44.2	380	54.7	254	31.9 %
	Other	901	46.8	586	48.5	465	41.7 %
	Total	1816	45.5	966	50.9	719	38.2 %
2020	Switzerland	926	36.3	378	45.2	276	8.7 %
	Other	980	36.0	636	41.2	592	13.0 %
	Total	1906	36.1	1014	42.7	868	11.6 %
Total	Switzerland	1841	40.2	758	50.0	530	19.8 %
	Other	1881	41.2	1222	44.7	1057	25.6 %
	Total	3722	40.7	1980	46.7	1587	23.7 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding and Postdoc.Mobility by the SNSF Data Team.

Higher success rates with a doctorate from abroad. Also measured by the country in which they obtained their doctoral degree, ‘international’ Spark applicants had a higher success rate (26% for those with a doctoral degree from abroad, vs. 22% for those with a Swiss degree).²¹ Also here we see a contrast to SNSF Project funding where there is no significant difference in success rate by doctorate country (table below). The proportion of applicants with a doctorate from abroad is however quite similar in the two schemes (58%, Table A 19 in Appendix 1).

Table 2.11 Success rates by applicant’s doctorate, Spark vs SNSF project Funding 2019 and 2020.

Year	Doctorate Country	Project funding		Spark	
		N proposals	Success rate %	N proposals	Success rate %
2019	Switzerland	713	45.7	294	35.0 %
	Other	916	46.8	363	42.1 %
	Total	1629	46.3	657	39.0 %
2020	Switzerland	701	35.2	329	10.0 %
	Other	1015	37.2	491	13.2 %
	Total	1716	36.4	820	12.0 %
Total	Switzerland	1414	40.5	623	21.8 %
	Other	1931	41.8	854	25.5 %
	Total	3345	41.3	1477	24.0 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding by the SNSF Data Team.

Far more junior researchers than in SNSF Project funding. The positions of the Spark applicants reflect their age profile (see above, Table 2.9) – 47% were junior researchers. This contrasts with SNSF Project funding where only 1% of proposals came from junior researchers (Table A 20 in Appendix 1). We find no consistent differences in success rate by Spark applicants’ position: In 2019, the group leaders had the highest success rate (as in SNSF Project funding), while in 2020 the junior researchers had the highest success rate (table below).

²¹ When controlled for other variables, a doctoral degree from abroad was not a significant success factor. See Table A11 and A13 in Appendix 1

Table 2.12 Success rates by function in project/position, Spark vs SNSF project Funding 2019 and 2020.

Year		Project funding		Spark	
		N proposals	Success rate %	N proposals	Success rate %
2019	Group leader, Senior physician	761	49.9	158	46.8 %
	Head of inst., dept etc	568	46.0	52	28.8 %
	Researcher, other*	458	38.4	189	32.8 %
	Junior researcher**	26	23.1	320	38.4 %
	Total	1813	45.4	719	38.1 %
2020	Group leader, Senior physician	833	37.6	171	7.0 %
	Head of inst., dept etc	570	39.3	42	9.5 %
	Researcher, other*	463	31.1	235	11.9 %
	Junior researcher**	38	15.8	420	13.6 %
	Total	1904	36.1	868	11.6 %
Total	Group leader, Senior physician	761	49.9	329	26.1 %
	Head of inst., dept etc	568	46.0	94	20.2 %
	Researcher, other*	458	38.4	424	21.2 %
	Junior researcher**	26	23.1	740	24.3 %
	Total	1813	45.4	1587	23.6 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding by the SNSF Data Team.

*'Researchers' include all categories of positions except junior researchers and leadership positions (i.e. not group leader, head of institute, department or similar).

**'Junior researchers' include postdocs, research associates and resident physicians, as well as a few PhD students.

Applicants in temporary and full-time positions had a higher success rate. 35% of the Spark applicants had a permanent position, the remaining 65% a temporary position (fixed-term contract or no contract). In line with younger applicants having a higher success rate, we also find that applicants in a temporary position had a higher chance of getting their proposal funded (table below). While the large majority (64%) of the applicants had full-time employment, the minority who worked part-time (below 100%) had in both years a somewhat lower chance of Spark funding (overall 4 percentage points lower, table below).

Table 2.13 Spark success rates by applicants' work contract/permanent position, percentages 2019 and 2020.

Year	Work contract/position	N	Success rate
2019	fixed-term contract	410	42.7 %
	no contract	53	32.1 %
	permanent contract	256	32.0 %
	Total	719	38.1 %
2020	fixed-term contract	511	13.9 %
	no contract	61	16.4 %
	permanent contract	296	6.8 %
	Total	868	11.6 %
Total	fixed-term contract	921	26.7 %
	no contract	114	23.7 %
	permanent contract	552	18.5 %
	Total	1587	23.6 %

Source: Data provided by the SNSF.

Table 2.14 Spark success rates by applicants with full time or part time positions, percentages 2019 and 2020.

Year	Part time or full time	N	Success rate
2019	Part time position	245	33.9 %
	Full time position	451	40.4 %
	Total	696	38.1 %
2020	Part time position	276	10.1 %
	Full time position	561	12.1 %
	Total	837	11.5 %
Total	Part time position	521	21.3 %
	Full time position	1012	24.7 %
	Total	1533	23.5 %

Source: Data provided by the SNSF.

Applicants who applied for their own salary had a lower success rate in 2019, but not in 2020. Differently from SNSF Project funding, Spark proposals could include applicant's own salary, and a majority (59%) of the applicants applied for their own salary. As shown in the table below, those who applied for their own salary had a lower success rate in 2019. For 2020, on the other hand, there is no significant difference (1 percentage point higher success rate to those who applied for own salary, table below). Furthermore, when looking jointly at temporary/permanent position and application for own salary, applicants in a temporary position have a higher success rate than those in a permanent position regardless of whether they applied for own salary or not (Table 2.16).

Table 2.15 Spark success rates by whether the proposal applied for applicants' salary, percentages 2019 and 2020.

Year	Applied own salary	N	Success rate
2019	No	297	44.1 %
	Yes	423	34.0 %
	Total	720	38.2 %
2020	No	351	10.8 %
	Yes	517	12.2 %
	Total	868	11.6 %
Total	No	648	26.1 %
	Yes	940	22.0 %
	Total	1588	23.7 %

Source: Data provided by the SNSF.

Table 2.16 Spark success rates by applicant’s work contract/permanent position and whether the proposal applied for applicant’s salary. Percentages (2019 and 2020).

Contract type	Applied Own Salary	N	Approved
Fixed-term contract	No	330	31.5 %
	Yes	591	24.0 %
	Total	921	26.7 %
No contract	No	3	33.3 %
	Yes	111	23.4 %
	Total	114	23.7 %
Permanent contract	No	315	20.3 %
	Yes	237	*16.0 %
	Total	552	18.5 %

Source: Data provided by the SNSF.

* The 38 funded applicants with a permanent contract who had applied for their own salary included two in full-time senior positions at Cantonal universities. The remaining held junior positions, part-time positions, and/or were employed at Universities of Applied Sciences, Universities of Teacher Education or at research institutes.

Different success factors in 2019 and 2020 (regression analyses)

In 2019, male applicants in a temporary position in the ETH domain, who did not apply for own salary, had a higher chance of success. Multivariate analysis indicates large variations in what appear as the significant success factors in 2019 and 2020. For 2019, including gender, age, field of research, type of university, applicants with/without a professorship, permanent or temporary position, a doctorate from Switzerland or from abroad, whether applied for own salary or not, in a (binominal logistic) regression model, we find that male applicants, applicants in a temporary position, applicants in the ETH domain and those who did not apply for own salary²² had a significant higher chance of funding (Table A 11 in Appendix 1). In a similar model for 2020, we find no effect of gender, application for own salary or type of university. In 2020, only age and temporary position appear with a significant effect: applicants aged below 40 and those in temporary positions had a higher chance of success in the competition for grants than those over 40 and in permanent positions (Table A 13 in Appendix 1).

No impact of algorithm matched reviewers or reviewer proximity to proposal in 2020. In the regression model for 2020, we also included the method for matching reviewers to the proposal (algorithm or not, only used in 2020), and whether the reviewers were within the specialization of the proposal or not (only data for

²² Regardless of type of applicant institution, jointly for 2019 and 2020 those who applied for their own salary had lower success rates than those who did not (with one exception, in the small and heterogeneous category of ‘other institutions’, the success rate was 2 pp higher among those applied for own salary). Most applicants (84%) from the Universities of Applied Sciences applied for their own salary. As noted in Section 2.1, applicants from the Universities of Applied Sciences had lower success rate than other Spark applicants. Also, when looking only at those who applied for own salary, the Universities of Applied Sciences came out with the lowest success rate.

2020). These factors did not appear to have any significant effects on the success of the proposals (Table A 13 in Appendix 1).

A simulated lower success rate for 2019 reduced gender bias. To further explore the role of the different success rates – and the different review grades needed for proposal approval the two years – we also ran the 2019 data with a simulated 2020 success rate (i.e. the grades required for funding in 2020).²³ Interestingly, with the simulated lower success rate/stricter grade requirements, the gender effect was reduced and no longer significant. Also, the effect of the ETH domain was reduced and no longer significant, while the effects applying for own salary and of a temporary position were still significant (Table A 12 in Appendix 1).

A simulated higher success rate for 2020 did not give significant gender bias. We also ran the 2020 data with a simulated 2019 success rate (i.e. funding all proposals with overall scores AA, AB, AC or AD), to explore the potential effects of a higher success rate for 2020. In this simulation, gender appeared insignificant for success, as in the actual 2020 selection process. On the other hand, with the higher simulated success rate, both having received previous SNSF grants and having a doctorate from abroad were added as significant success factors, while the effect of holding a temporary position was reduced and no longer significant (Table A 14 in Appendix 1).

In conclusion, the different ways of setting the funding threshold in the two years do not explain the differences in success factors between years. Still, we see that with a lower success rate we find *fewer* identifiable success factors/applicant characteristics that seem to have an effect on the success of the proposal. The finding that a simulated lower success rate for 2019 would remove significant gender bias, is in line with the SNSF's own analyses of the Spark data (Heyard and Jorstad 2021).

Motivations for applying for Spark

The Spark applications were motivated by exploring unconventional and risky ideas, but were also seen as a step in building an academic career. When the applicants were asked what had motivated their application, the most common answers were that their Spark proposal was an opportunity to address ideas with limited basis in previous research (unconventional research) or to test high-risk/high impact research ideas. 8 in 10 respondents indicated these as important motivations – 4 or 5 on a scale from 1 to 5 – on these two motivations. That the Spark proposal was exclusively assessed on the project description and that they saw Spark as a

²³ In 2019, all proposals scored 'A' by a least one of the reviewers were funded. In 2020, only proposals rated A by both reviewers or 'A' by one and 'B' by the other were funded. Additionally, to be funded in 2020, those with an AB overall rate also needed to have high scores on the review criteria 'Originality' and 'Unconventionality'. See Section 1.1.

step in building an academic career were also important motivations for many. About 64–65% of the respondents answered 4 or 5 on these motivations (table below). Applicants from the Universities of Applied Sciences somewhat less often indicated that the project was a step in building an academic career or needed to be implemented quickly (Table A22 in Appendix 1).

Double-blinded review and new ideas attracted applicants: From their free text comments, the combination of doing research in a new field/a kind of research in which they lacked a CV and blind review seemed key to many. They gave a mix of reasons why the Spark call for new research ideas and/or blind review fitted their project, e.g.:

- *An unconventional idea that had been attempted by few only before and for which I had no previous track record.*
- *Additional to g) [assessed exclusively on the project description] little to no own track record in the field of the project is consequently required.*
- *In my field it is of great advantage to be evaluated without disclosing the identity. I believe that my association with a particular PI in the past has otherwise negatively affected my forthcoming.*
- *Anonymous evaluation reduces bias against Universities of Applied Sciences*
- *Opportunity to ‘test’ an alternative career thanks to the interdisciplinary aspect.*

A majority of the project ideas were developed before the Spark call and/or did not fit other funding schemes. According to the applicants, the project ideas were more often developed before the Spark call (57% indicated 4 or 5) than motivated by the Spark call (42% indicated 4 or 5), and the project ideas often did not fit other SNSF funding instruments (55% indicated 4 or 5). Projects that needed to be implemented fast appear as one of the least prominent motivations, yet 43% indicate this as important (43% indicated 4 or 5, table below).

Table 2.17 Applicants' motivation to apply for Spark (2019 and 2020). Percentages.

Why did you apply for a Spark grant? Please indicate your motivations on the scale from 1 to 5.	1 Not at all	2	3	4	5 To a great extent	Cannot say	N
a) I needed funding for a project idea which was developed before I learnt about the Spark call.	14	13	13	23	34	1	858
b) I developed a new project idea that was motivated by the Spark call.	26	18	14	20	22	1	856
c) It was an opportunity to address ideas with limited basis in previous research (i.e. unconventional research).	2	4	10	33	50	1	859
d) It was an opportunity to test high-risk/high impact research ideas*.	3	4	13	28	50	2	860
e) It was an opportunity to address interdisciplinary research ideas.	11	14	20	22	32	1	857
f) The project did not fit to other funding instruments of the SNSF.	9	12	17	21	34	7	858
g) I was motivated by the possibility of being assessed exclusively on the project description	11	8	14	19	46	1	859
h) I saw the proposal/project as a step in building an academic career.	14	8	13	20	44	1	857
i) My colleagues/head of lab/department encouraged me to apply for a Spark grant.	29	11	14	17	24	4	856
j) I had a project that needed to be implemented fast.	18	17	21	22	21	1	854

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

Opportunities for unconventional and risky ideas motivated awarded proposals. Notably, those who got their Spark proposal approved more often reported that they applied because they saw the Spark call as an opportunity to address ideas with limited basis in previous research and to test high-risk/high impact ideas. While 6 in 10 applicants with approved proposals answered that their application to a great extent was motivated by these factors, 4 of 10 applicants without approved proposals answered so (means in table below, regression table in Appendix 5, Question 1).

Table 2.18 Applicants' motivation to apply for Spark, approved and not approved proposals (2019 and 2020). Means on scale 1 (not at all) to 5 (To a great extent), and percentage indicating 5 (To a great extent).

Why did you apply for a Spark grant? Please indicate your motivations on the scale from 1 to 5.	Not approved		Approved	
	% 5	Mean rate	% 5	Mean rate
a) I needed funding for a project idea which was developed before I learnt about the Spark call.	32	3.45	38	3.63
b) I developed a new project idea that was motivated by the Spark call.	21	2.93	22	2.99
c) It was an opportunity to address ideas with limited basis in previous research (i.e. unconventional research).	45	4.18	58	4.39
d) It was an opportunity to test high-risk/high impact research ideas*.	43	4.06	63	4.45
e) It was an opportunity to address interdisciplinary research ideas.	31	3.47	34	3.59
f) The project did not fit to other funding instruments of the SNSF.	35	3.66	34	3.64
g) I was motivated by the possibility of being assessed exclusively on the project description	44	3.77	50	3.91
h) I saw the proposal/project as a step in building an academic career.	41	3.68	48	3.82
i) My colleagues/head of lab/department encouraged me to apply for a Spark grant.	24	2.95	26	3.00
j) I had a project that needed to be implemented fast.	21	3.18	22	3.04

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

Important field differences. Analyses of differences between fields of research indicate that the career perspective of Spark was more frequent among researchers in the social sciences and humanities (SSH) than among researchers in the life sciences and STEM. Furthermore, among SSH researchers Spark was more often (than among life sciences and STEM researchers) seen as an opportunity to address interdisciplinary research ideas and less frequently an opportunity to test high-risk/high impact research ideas. STEM researchers less frequently indicated that their proposals were motivated by addressing ideas with limited basis in previous research (table in Appendix 5, Question 1).

For many the Spark proposal was part of career building

Seeing Spark as a step in building their academic career was, as would be expected, more prominent among junior researchers and researchers in a temporary position. Also, female researchers more frequently than their male colleagues saw Spark as a step in building their career. While 52% of female researchers answered to a great extent (5 on a scale from 1 to 5) on this motivation, only 39% of male researchers did so. The gender difference is significant also when controlling for junior and temporary positions and other background variables (regression tables in Appendix 5, Question 1).

One of the institute heads explained in an interview that Spark was open and therefore especially appreciated among postdocs who could also apply. In her/his institute, only postdocs applied, and these postdocs took the chance to write their own projects and did not depend on professors as in Project funding. S/he did not consider applying her/himself, both because s/he had lot of projects running, but also because:

'I felt that it was for the younger researchers so I would have felt bad taking funding from them. In Spark, everyone was invited, but I felt it was not for me. The format was attractive for them [younger researchers].'

Most interviewees also pointed to Spark as an important tool for building an academic career for junior researchers. Spark was described as a career instrument for young researchers to develop independency and to be bold, and as a stepping-stone to permanent positions. An interviewee who was head of a research group said that the postdocs from her/his group who got the Spark funding, went on to tenure track assistant professors' positions, and that Spark was crucial to that, as they got an independent grant funding record – which was pretty unusual among postdocs. S/he further pointed out that postdocs who recently got their PhD could not apply for SNSF Project funding, they were not eligible. To this end, Spark was seen as a 'solution' to a Swiss research system described as a 'Catch 22':

'There is a dilemma that postdocs are supposed to become independent, but they have no way to get money [due to eligibility criteria] and become independent. So, it depends on the leeway the professor gives to the postdoc. SNSF has to rethink, there is no way to get independent, except for Spark.'

A head of a department followed up on this, stressing that the biggest advantage of Spark was that it did not require permanent employment, which was required by other SNSF funding. The short-term funding was also an advantage for the young researchers, and s/he added that Spark was too short term for oldsters. While there is other funding for young researchers, like the Postdoc/Ambizione funding, this is longer term, but it was possible to start something new with the Spark grant. As such, the young researchers could still be employed for example as a regular Postdoc, but have some additional money that was their money, and by that the possibility to prove themselves. In her/his view, Spark was the perfect instrument for this group to become independent. As such, s/he argued an eventual future Spark should have young researchers as target group, to fill an important gap in the funding landscape:

'Spark should be for the youngsters, maybe limited to people at the beginning of the career. People in permanent positions can get their money somewhere else. I would really restrict it to the youngsters.'

Another interviewee pointed out that Spark not necessarily was, or should be, an early career instrument, though many young researchers in her/his institute saw Spark as an opportunity. However, funding is limited in Spark, s/he stressed, and may thus appear less attractive to more senior researchers. In her/his view, these would rather write larger proposals for a larger grant.

2.3 Attractiveness and eligibility

Applicants' views on the Spark framework conditions and terms

Compared with other SNSF funding schemes, Spark appears better for exploring new ideas and for young talents. When asked to compare Spark with other SNSF funding schemes, many did not have an opinion – which may be explained by many applicants having little prior experience with the SNSF (see Section 2.2). Still a large proportion (58%) replied that Spark gave better possibilities to explore and experiment with new ideas and openings in research. 48% of the respondents said that Spark was better on grants available for young researchers, and 42% indicated that Spark was better on seeded funding to generate preliminary data (table below). Notably, on all questions we see a significant difference between those who got their Spark proposal approved and those who did not, where the former group more frequently perceived Spark better than other SNSF funding schemes (table below, results from regression analysis in Appendix 5, Question 9).

There were some differences between different groups of researchers. Male researchers more frequently saw Spark as better regarding flexibility of the use of funds. Junior researchers and researchers in fixed-term positions perceived Spark as more adequate for their career level (tables in Appendix 5, Question 9).

Table 2.19 Spark’s attractiveness compared with applicants’ other SNSF funding schemes. Replies from Spark applicants, by approval of Spark proposal. Percentages.

Comparing the Spark pilot to other SNSF funding schemes* you are familiar with, was Spark poorer, about the same or better, concerning	Better	About the same	Poorer	Cannot say/not applicable	N
E: Flexibility of use of funds					
Not approved	16	32	4	48	493
Approved	34	35	4	26	295
Total	23	33	4	40	788
F: Seed funding to generate preliminary data					
Not approved	35	19	4	43	489
Approved	55	12	1	31	296
Total	42	16	3	38	785
G: Possibility to explore and experiment with new ideas/openings in research					
Not approved	48	20	6	27	491
Approved	74	6	1	20	296
Total	58	14	4	24	787
H: Grants available for young research talents					
Not approved	42	18	6	33	493
Approved	58	12	0	30	297
Total	48	16	4	32	790
I: Adequacy for your career level					
Not approved	32	32	6	29	489
Approved	45	30	4	21	295
Total	37	31	6	26	784
J: Adequacy for your funding needs					
Not approved	27	32	14	27	489
Approved	36	32	12	20	293
Total	31	32	13	24	782

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

* When asked to specify the SNSF funding which was their main reference for comparison, 52% answered Project funding, 13% Ambizione and 9% Postdoc.Mobility and the rest mentioned a variety of other schemes (table in Appendix).

Most applicants agreed that the Spark pilot fitted needs for rapid funding of unconventional research in Switzerland: When asked about the adequacy of the terms of the Spark pilot, the majority of the respondents gave positive scores (4 or 5 on the scale from 1 to 5) while very few indicated negative views: 75% indicated that the categories of eligible researchers were adequate, 74% saw the terms adequate for providing grants for young research talents, 73% indicated that the speed of the application and selection process was adequate, 64% thought the types of institutions eligible for hosting Spark projects were adequate (20% replied ‘cannot say’), 56% thought the amount of funding was adequate and 52% the project duration (table below). Applicants in temporary positions were more positive on Spark’s adequacy for young talents, and for all aspects²⁴ those who got their proposals funded more often perceived the Spark pilot as adequate than the ones with non-approved proposals. There were no significant differences between fields or calls

²⁴ Except for ‘Project duration’ where there was no significant difference between approved and non-approved applicants.

in replies, except that those in the extra call in June 2020 were less positive on the speed of the application and selection process²⁵ (tables in Appendix 5, Question 10). Notably, the figures include the views of those who applied for Spark projects and presumably found the terms and conditions adequate for their needs. The views reported in the reviewer survey and in the interviews with stakeholders, analysed in Chapter 4.2, are more diverse.

Table 2.20 Applicants' views on the adequacy of the terms and conditions of Spark. Percentages.

To what extent do the terms of the Spark pilot fit the needs you see for rapid funding of unconventional research in Switzerland concerning:	1	2	3	4	5	Cannot say	N	Mean rate (1-5)
	Not at all				To a great extent			
A: Speed of the application and selection process	3	6	14	33	40	3	816	4.04
B: Amount of funding	2	10	29	34	22	3	813	3.64
C: Project duration	4	13	30	34	18	2	813	3.49
D: Categories of researchers eligible for grants	2	4	11	26	49	8	810	4.28
E: Grants available for young research talents	2	4	9	24	50	11	811	4.30
F: Types of institutions eligible for hosting the projects	2	2	12	26	38	20	807	4.22

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

2.4 Attractiveness and outreach – Summary results

New applicants and a broader target group. Concerning fields and institutions that were attracted to the Spark instrument, we found that the majority of the applicants – regardless of their institutional affiliation – had not previously obtained a grant from the SNSF. Of the 1588 proposals, 1042 (66%) had a main applicant with no previous SNSF grant. There were relatively more proposals coming from Universities of Applied Sciences, while proposals from the ETH domain had the highest success rate. Our comparative analyses show that in both years, the life sciences had a higher percentage of the Spark proposals than of the proposals to SNSF Project funding and SNSF Postdoc.Mobility, while proposals within STEM fields had a substantially higher success rate within Spark.

Novel projects and risky ideas. The applicants reported that the Spark projects were more often based on novel or risky ideas, compared with their other projects. The reviewers, however, did often not find the Spark projects different from other projects, though they found some to be more risky or unconventional. Moreover, the urgency of getting the projects funded varied, and almost half of the reviewers saw little difference from other projects by this mean. From the applicants' point of view, there is a significant difference between applicants in permanent and temporary positions: applicants in temporary positions more often indicated that research opportunities and talent would get lost if waiting.

²⁵ Lower satisfaction in this group relates to blinding problems and resubmission, see Section 3.1.3.

Opportunities for unconventional and risky ideas often motivated awarded proposals. A clear motivation for applying for Spark was to explore unconventional and risky ideas. Those who got their Spark proposal approved more often reported that they applied because they saw the Spark call as an opportunity to address ideas with limited basis in previous research and to test high-risk/high impact ideas. Most of the project ideas were developed before the Spark call and/or did not fit other funding schemes. We find important field differences concerning motivation: the career perspective, and the opportunity to address interdisciplinary research ideas, was more frequent among SSH researchers than researchers in life sciences and STEM.

More female applicants, but with lower success rate. Spark attracted a larger proportion of female applicants compared with SNSF Project funding, and the proportion of female Spark applicants increased from 32% in 2019 to 39% in 2020. Still, in 2019 women had significantly lower success rates than men in Spark, though this was not the case in Postdoc.Mobility and Project funding.

More junior researchers, with higher success rate. Moreover, Spark attracted far more junior researchers than SNSF Project funding, and the younger applicants had a higher success rate in Spark. Applicants in temporary position also had a higher chance of getting their proposal funded – regardless of whether they applied for their own salary or not. A majority of the applicants applied for their own salary. Spark was also seen as a career instrument for young researchers to develop independence, and as a steppingstone to permanent positions. Some stakeholders also argued that a future Spark should have young researchers as an explicit target group. Compared with other SNSF funding schemes, Spark appears better for exploring new ideas, as well as for young research talents.

More non-Swiss applicants. Compared with other SNSF funding schemes Spark attracted a higher proportion of applicants without Swiss citizenship. Also different from other SNSF schemes, those without Swiss citizenship had clearly higher success rates.

The success profiles for the two pilot years differed greatly. For 2019, including in the analysis gender, age, field of research, type of university, applicants with/without a professorship, permanent or temporary position, doctorate from Switzerland/abroad, applied for own salary or not, we found that male applicants, applicants in a temporary position, applicants in the ETH domain and those who did not apply for own salary had a significantly higher chance of funding. In a similar model for 2020, only age and temporary position have a significant effect: applicants below the age of 40 and in a temporary position had a higher chance of success in the competition for grants. When running the 2019 data with a simulated 2020 success rate (i.e. the grades required for funding in 2020), the gender effect was reduced and no longer significant.

Neither algorithm matching of reviewers to proposals nor reviewer closeness to the proposals significantly impacted the 2020 success rates. The method for matching reviewers to the proposal (algorithm, only used in 2020, or manual), does not appear to have had any significant effect on whether proposals were funded. Nor do we find a significant effect of differences in reviewers' closeness to the field of the proposal.

3 Adequacy of selection processes and framework

Funding agencies are reliant upon adequate review and selection procedures to select the proposals most likely to meet the goals of the funding programme. The ability to fund proposals that largely meet the Spark evaluation criteria is therefore an overarching focus for this evaluation. This includes the expertise and the organization of reviews, the communication and transparency as well as resources and efficiency and integration in the SNSF funding portfolio.

3.1 Expertise and selection procedure

3.1.1 Expertise, disciplinary distance and contradictory reviews

Applicants' satisfaction with the reviews

Varied satisfaction with the reviews. The applicants were asked about the reviewers' abilities to assess all the fields involved in the applications, to provide an open-minded/unbiased review and whether they provided a thorough assessment. Many applicants replied 'Cannot say/Did not receive any review' on these questions (70% of the funded and 7% of the non-funded, the latter in most cases had not received the review reports and consequently had no basis for replying).²⁶ Among those who answered, the responses from the non-funded applicants were spread across the whole scale from 1 to 5, whereas the funded applicants used the upper side of the scale more (table below). The mean scores indicate little difference between the questions: the average rate from the non-funded is around 3 on the ability to assess all the fields, on open-minded/unbiased review and on thoroughness, whereas the average rates from the funded applicant are around 4.4 on all three questions. Compared with similar figures for other funding schemes, an

²⁶ Review reports were sent to all rejected applicants, but not to the funded applicants – unless they asked for them.

average score around 3 from non-funded applicants is not low.²⁷ The similar figures for NCCR²⁸ applicants who did not make it to a full proposal was 2.5 on the ability to assess all the fields in the proposal and 2.2 on the thoroughness of the assessments (Langfeldt et al. 2021, Table 3.3). The applicants in the 2019 call expressed more satisfaction with the reviews, but when controlled for proposal approval, gender, position and field, there is no significant difference between years (table in Appendix 5, Question 6).

Table 3.1 Applicants' views on the reviews of their Spark proposal, by approval of Spark proposal. Percentages.

Based on the anonymous review reports you received (in case of a negative decision*), to what degree do you think the reviewers who assessed your Spark proposal:	1 Not at all	2	3	4	5 To a great extent	Cannot say/ Did not receive any review	N	Mean rate (1-5)
a) Were able to assess all the fields of research involved in the application?								
Not approved	13	22	29	19	10	7	525	2.99
Approved	0	0	2	14	13	70	288	4.33
Total	7	13	20	20	11	30	813	3.19
b) Provided an open-minded/unbiased assessment of your application?								
Not approved	11	20	29	22	10	7	525	2.99
Approved	0	1	2	10	17	70	287	4.45
Total	8	13	17	20	13	29	812	3.21
c) Provided a thorough assessment of your application?								
Not approved	13	20	25	25	10	7	525	2.91
Approved	0	1	2	12	15	70	285	4.35
Total	9	14	20	16	12	29	810	3.12

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

*Review reports were to be sent to all rejected applicants. Funded applicants only received the report if they asked for it.

Many non-funded applicants were dissatisfied with reviewer competence. Also, when asked more generally about the competence of the experts reviewing the proposals, many of the non-funded applicants are negative, whereas the funded applicants are far more positive (table below). When asked to compare the competence of the Spark reviewers with other SNSF funding schemes they were familiar with, a majority replied 'Cannot say' or 'About the same'. Of those who stated an opinion, a large part of the non-funded applicants found Spark reviewers to have poorer competence, whereas many of the funded applicants found Spark reviewers to have better competence (table below). We find no significant differences in replies between the Spark calls, or the gender or research field of applicants (tables in Appendix 5, Questions 5c and 9a).

²⁷ Table 3.7 in Langfeldt & Borlaug (2016) provides results from four different funding schemes. Spark scores on level with or better than these.

²⁸ NCCR stands for Swiss National Centres of Competence in Research. This is a SNSF funding scheme providing long-term grants to establish research centres.

Table 3.2 Applicants' satisfaction with the competence of the experts reviewing their proposals. Percentages.

Considering your Spark application, to what extent did you find the following issues and processes satisfactory? 5c) The competence of the experts reviewing the proposals	1	2	3	4	5	N	Mean rate (1-5)	
	Not at all				To a great extent			Cannot say
<i>Results of Spark selection process:</i>								
Non-approved proposal	13	20	26	18	10	12	526	2.90
Approved proposal	1	1	4	22	38	34	306	4.45
Total	8	13	18	19	20	20	832	3.37

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

Table 3.3 Spark reviewer competence compared with other SNSF funding schemes. Replies from Spark applicants, by approval of Spark proposal. Percentages.

Comparing the Spark pilot to other SNSF funding schemes* you are familiar with, was Spark poorer, about the same or better, concerning 9a) Reviewer competence	Better	About the same	Poorer	*Cannot say/ not applicable	N
Non-approved proposal	4.6	36.3	26.2	32.9	496
Approved proposal	13.5	24.3	0.3	61.8	296
Total	8.0	31.8	16.5	43.7	792

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

*When removing those without an opinion and those who had no previous SNSF grant (we do not have information about those who had applied but not obtained other SNSF grants), 212 respondents remain – 49 whose Spark proposal was approved and 163 with non-approved Spark proposals. In this subsample, we find a similar pattern as in the table with all respondents: Of the non-approved Spark applicants 5% indicate that Spark is better, 53% indicate 'About the same' and 42% 'Poorer'. Of the approved Spark applicants 27% indicate that Spark is better, 74% indicate 'About the same' and 0% 'Poorer'.

Reviewer characteristics and experiences

Most of the reviewers had previous grant review experiences. 79% of the Spark reviewers had reviewed one or more proposals for the SNSF the last ten years, and 96% had reviewed one or more proposals for other funding agencies. Those with extensive previous review experiences more often reviewed Spark proposals both in 2019 and 2020 (table below).

Table 3.4 The Spark reviewers' other review experiences. By Spark review year. Percentages.

Proposals reviewed last 10 years	Reviewed proposals in			Total
	Only 2019	Only 2020	2019 and 2020	
a) Grant proposals reviewed for the SNSF (not including Spark proposals)				
0	16.1 %	26.8 %	13.3 %	21.0 %
1 to 5	77.6 %	67.1 %	55.4 %	67.0 %
6 to 20	3.4 %	4.7 %	21.7 %	8.4 %
above 20	2.9 %	1.4 %	9.6 %	3.7 %
N (reviewers)	174	365	166	705
b) Grant proposals reviewed for other funding agencies				
0	7.1 %	3.1 %	3.8 %	4.3 %
1 to 5	32.0 %	34.0 %	20.8 %	30.4 %
6 to 20	27.8 %	28.0 %	21.4 %	26.4 %
above 20	33.1 %	34.8 %	54.1 %	38.9 %
N (reviewers)	169	353	159	681

Source: Spark reviewer survey 2021.

Compared with the applicant population, the reviewer pool contained more senior scholars and less women. The majority of the reviewers were male (70%), full professors or lead researchers/similar (58%), and located in North America, Australia or Europe (88%). One third of the reviewers were 40–49 years old, 13% were below 40, 26% were 50–59, and 27% were above 60 years old (table below). In contrast, a large part of the applicants were below 40 years old (58%), and the share of women was somewhat higher than among the reviewers (36%). The men, the full professor and the European reviewers somewhat more often served as reviewers both years. A large part of the reviewers indicated that their field of research was within the natural (39%) or social (24%) sciences, whereas 14% indicated the medical sciences, 12% engineering and technology and 8% the humanities (table below, gender figures are complete data from the SNSF, the remaining only covers those who replied to the survey).

Table 3.5 The Spark reviewers' gender, position, age and country. By Spark review year. Percentages.

Reviewer characteristics	Reviewed proposals in			Total
	2019 only	2020 only	2019 and 2020	
Gender*				
Female	29.7 %	31.2 %	24.7 %	29.6 %
Male	70.3 %	68.8 %	75.3 %	70.4 %
N	343	647	235	1225
Position				
Lead Researcher/Head of Research/similar	5.1 %	4.1 %	4.2 %	4.4 %
Full professor/similar	51.7 %	51.1 %	60.5 %	53.4 %
Associate professor/similar	25.6 %	23.1 %	20.4 %	23.1 %
Assistant professor/similar	8.5 %	16.6 %	10.2 %	13.1 %
Other	9.1 %	5.2 %	4.8 %	6.0 %
N	176	368	167	711
Age				
Below 40	11.9 %	14.2 %	15.0 %	13.8 %
40-49	31.3 %	37.2 %	27.5 %	33.4 %
50-59	31.8 %	22.1 %	28.7 %	26.1 %
60 or above	25.0 %	26.5 %	28.7 %	26.7 %
N	176	366	167	709
Country				
Canada, USA and Australia	46.0 %	42.1 %	35.3 %	41.5 %
Europe (other than UK)	28.4 %	24.9 %	31.1 %	27.2 %
United Kingdom	14.8 %	20.8 %	19.8 %	19.0 %
Other	10.8 %	12.3 %	13.8 %	12.3 %
N	176	366	167	709
Research field				
Natural sciences and agriculture	31.6 %	43.3 %	36.4 %	38.8 %
Engineering and technology	7.5 %	12.3 %	13.9 %	11.5 %
Medical sciences	13.2 %	14.8 %	11.5 %	13.6 %
Social sciences	28.2 %	19.7 %	29.1 %	24.0 %
Humanities	13.2 %	6.3 %	7.9 %	8.4 %
Other	6.3 %	3.6 %	1.2 %	3.7 %
N	174	365	165	704

Source: Spark reviewer survey 2021. *Gender figures: Data from SNSF.

The reviewers found the criteria clear and easy to understand and the proposals close to their expertise. When asked about the Spark review criteria and guidelines, a large majority of the reviewers indicated that they were clear and easy to understand (89% indicating 4 or 5 on a scale from 1 to 5 on the criteria and 88% on the guidelines, table below). Moreover, 86% indicated that the proposal(s) they reviewed was/were close to their field of expertise. As for the various review criteria, few indicated any difficulty with any of them. 'Unconventionality' appears to have been the most difficult to assess: When asked to what extent they were able to assess the various aspects, the 'Unconventionality' of the proposed project(s) appears with an average score of 4.1 on a scale from 1 to 5, while 'Potential for significant impacts' get an average score of 4.2, 'Originality/Novelty' with 4.5 and 'Scientific quality' with 4.6 (table below).

Table 3.6 The Spark reviewers' views on the criteria and their ability to assess the Spark proposals. Percentages.

	1	2	3	4	5			
	Not at all/in no cases				To a great extent/in all cases	Can-not say	N	Mean rate (1-5)
Comprehensibility of criteria and ability to assess the Spark proposals. Please indicate to what extent you agree with the statements below.								
a) The review criteria were clear and easy to understand	0	0	3	36	53	8	688	4.54
b) The review guidelines provided by the SNSF were clear and easy to understand	0	0	3	31	57	9	689	4.59
c) The proposal(s) I reviewed was/were close to my field of expertise	0	2	9	38	48	4	688	4.36
d) I was able to assess the 'Originality/Novelty of the proposed project(s) assigned to me	0	1	5	34	55	4	686	4.49
e) I was able to assess the 'Unconventionality' of the proposed project(s) assigned to me	1	5	14	36	37	7	688	4.12
f) I was able to assess the 'Scientific quality' of the projects assigned to me	0	2	3	28	63	4	684	4.58
g) I was able to assess the 'Potential for significant impacts' of the proposed project(s) assigned to me	1	4	11	37	42	5	685	4.24

Source: Spark reviewer survey 2021.

Reviewers found it hard to assess unconventionality, especially when the proposal was not in their field of expertise. Many of the open field comments in the reviewer survey concerned the difficulties of assessing unconventionality and distinguishing the unconventionality criterion from the originality/novelty criterion. One reviewer pointed out that 'Strictly interpreted, evaluation of originality and unconventionality would need an intimate knowledge on the specific topic of proposal'. And whereas some said they had declined to review proposals that were outside their area of expertise, others had accepted to review some proposals outside their field. And as one of the quotes below illustrates, in the second Spark call, only those who reviewed at least two proposals got paid, which incentivized them to take on proposals outside their field:

- *The assigned projects were not necessarily in areas with which I am fully knowledgeable. Therefore it was often difficult to determine exactly how novel and unconventional these proposals were.*
- *I was repeatedly asked to review proposals that were well outside my area of expertise. I declined those requests.*
- *In second round it[...] was tricky that 2 proposals were proposed for review (to get paid) but as one was out of my expertise then I needed to stay for one review.*
- *No concerns - I sometimes get asked to review papers and proposals which are outside my research area, but this was targeted correctly!*

Impact is often hard to assess. There were also some comments regarding the impact criterion, emphasizing that potential impacts are difficult to predict and assess, and some were sceptical to this review criterion:

- Potential impact is always most difficult to assess.
- More a project is original and unconventional more it could be hard to foresee all its impacts.
- I think the impact statements can be revealing and useful, but the concept is vague and it tends to encourage wild claims.
- I am always concerned about impact questions. Significant impacts from any one research study are rare. Applicants are often pressured into making unrealistic claims. (I realise the question says 'potential' but perhaps the word 'significant' could be omitted. However, this question is being widely used in review guidelines.)
- All research is done with the aim to contribute to the research field and to the societies we work in. However, a strong focus on impact of a study can limit foundational research.

Grades, reviewer match and success rates (review and reviewer data)

Lower success rate for proposals with good match to reviewers' area of specialization. The success rate is somewhat lower for Spark proposals where both reviewers indicate that the proposal is within their area of specialization, than for proposals where at least one of the reviewers indicates that the proposal is within their wider discipline (table below, figures for 2020 only/data on reviewer match to proposal topic only for 2020). Notably, when controlling for other background variables, the lower success rate for those with good reviewer match is not significant (see Section 2.2).

Table 3.7 Success rates by reviewer match to proposal topic. Spark proposals 2020. Percentages.

Reviewer match to proposal topic	N proposals	Success rate %
Both reviewers 'is within my area of specialization'	254	9.1
Both reviewers 'within my wider discipline'	150	14.0
One reviewer in wider discipline, one in area of specialization	400	13.8
Other replies	17	11.8
Total	821	12.3

Source: Data provided by the SNSF.

More contradictory reviews when proposals are within reviewers' area of specialization. The two reviewers assigned each proposal gave the same overall grades in 30% of the cases, in 45% of the cases they differed by one grade (e.g. A vs. B or B vs. C etc.), while in the remaining cases they differed by two grades or more (A vs. C, B vs. D or A vs. D). Splitting the data by reviewers' indication of proximity to the proposal, we see that when one or both of the reviewers indicate that the proposal is within reviewers' area of specialization, there is somewhat more often a gap by two or three grades. For the overall grades, the difference between the proposals

reviewed by two close experts compared with two more distant experts, is 5 percentage points more proposals with clearly divergent scores (i.e. more than 1 grade gap). The similar figure for the scores on unconventionality is 6 percentage points, for scores on scientific quality 6.5 percentage points and for scores on potential impacts 7 percentage points, whereas for the scores on originality the difference is marginal (1.7 percentage point, table below).

Table 3.8 Match between reviewer grades by reviewer match to proposal topic. Spark proposals 2020. Percentages.

Review criterion	Reviewer match to proposal topic	Match between reviewer scores			N
		Full match	1 grade difference	2 or 3 grades difference	
Overall grade	Both reviewers 'is within my area of specialization'	30.7	43.7	25.6	254
	Both reviewers 'within my wider discipline'	28.7	50.7	20.7	150
	One reviewer in wider discipline, one in area of specialization	29.8	42.5	27.8	400
	Other replies	37.5	50.0	12.5	16
	Total	30.0	44.5	25.5	820
Originality	Both reviewers 'is within my area of specialization'	31.1	49.2	19.7	254
	Both reviewers 'within my wider discipline'	31.3	50.7	18.0	150
	One reviewer in wider discipline, one in area of specialization	35.0	48.0	17.0	400
	Other replies	50.0	43.8	6.3	16
	Total	33.4	48.8	17.8	820
Unconventionality	Both reviewers 'is within my area of specialization'	30.3	46.9	22.8	254
	Both reviewers 'within my wider discipline'	32.0	51.3	16.7	150
	One reviewer in wider discipline, one in area of specialization	37.8	41.0	21.3	400
	Other replies	37.5	43.8	18.8	16
	Total	34.4	44.8	20.9	820
Scientific Quality	Both reviewers 'is within my area of specialization'	31.9	42.9	25.2	254
	Both reviewers 'within my wider discipline'	31.3	50.0	18.7	150
	One reviewer in wider discipline, one in area of specialization	29.5	48.5	22.0	400
	Other replies	37.5	50.0	12.5	16
	Total	30.7	47.1	22.2	820
Potential Impacts	Both reviewers 'is within my area of specialization'	28.7	45.3	26.0	254
	Both reviewers 'within my wider discipline'	27.3	54.0	18.7	150
	One reviewer in wider discipline, one in area of specialization	29.0	45.8	25.3	400
	Other replies	31.3	56.3	12.5	16
	Total	28.7	47.3	24.0	820

Source: Data provided by the SNSF.

Close reviewers more often gave lower grades. When the proposals were within the area of specialization of the reviewer they somewhat more often received lower grades (C or D), whereas when they were within the wider discipline of the reviewer they more often obtained B. Hence, it seems close reviewers more often felt confident to give lower scores, whereas reviewers with less proximity were less critical (table below).

Table 3.9 Reviewer grades by reviewer match to proposal topic. Spark reviews* 2020. Percentages.

Overall Grade	is within my area of specialization	is within my wider discipline	other	Total
A	23.0	23.0	25.0	23.0
B	30.6	34.1	31.3	32.1
C	32.0	30.9	43.8	31.6
D	14.5	11.9	0.0	13.2
Total	913	712	16	1641

*The sample consists of the Spark reviews in 2020, two per proposal, i.e. the units of analysis are the reviews (not the proposals or the reviewers). Data on reviewer match to proposal topic is not available for 2019.

Harder to obtain top scores for proposals within the specialization of both reviewers. A result of the lower scores and more gap in reviewer scores among the proposals which were within the specialization of both reviewers, is that they – with the selection criteria applied for the 2020 proposals – have a lower success rate (as shown in Table 3.7). Looking into the distribution of scores we see that when the proposal was within the specialization of both reviewers, lower proportions of the proposals ended up with overall score AA or AB – implying a possibility for funding in 2020 – and a higher proportion with AC – implying no possibility for funding in 2020 (5% AA with both reviewers within the specialization compared with 9% AA with both reviewers within the wider discipline, and 11% AB with both reviewers within the specialization compared with 15% AB among those with both reviewers within the wider discipline, table below).

Table 3.10 Overall grades by reviewer match to proposal topic. Spark reviews 2020. Percentages.

Overall Grade	Both reviewers 'is within my area of specialization'	Both reviewers 'within my wider discipline'	One reviewer in wider discipline, one in area of specialization	Other replies	Total
A-A	4.7 %	8.7 %	7.0 %	0.0 %	6.5 %
A-B	11.4 %	15.3 %	16.5 %	31.3 %	15.0 %
A-C	15.4 %	12.7 %	14.5 %	12.5 %	14.4 %
A-D	2.8 %	2.0 %	5.0 %	0.0 %	3.7 %
B-B	10.6 %	9.3 %	12.3 %	12.5 %	11.2 %
B-C	18.9 %	24.7 %	17.8 %	18.8 %	19.4 %
B-D	7.5 %	6.0 %	8.3 %	0.0 %	7.4 %
C-C	11.0 %	8.0 %	9.0 %	25.0 %	9.8 %
C-D	13.4 %	10.7 %	8.3 %	0.0 %	10.1 %
D-D	4.3 %	2.7 %	1.5 %	0.0 %	2.6 %
N	254	150	400	16	820

Lower grades on unconventionality with two close reviewers. The most notable difference was for the scores on unconventionality (table below): When the proposal did not match the specialization of any of the reviewers (i.e. both reviewers were within the wider discipline), 21% ended up with AB on unconventionality (compared with 11% in the group with two specialist reviewers) and 7% with AC (compared with 14% in the group with two specialist reviewers).

Table 3.11 Grades on Unconventionality by reviewer match to proposal topic. Spark reviews 2020. Percentages.

Overall Grade	Both reviewers 'is within my area of specialization'	Both reviewers 'within my wider discipline'	One reviewer in wider discipline, one in area of specialization	Other replies	Total
A-A	6.3 %	4.7 %	5.8 %	12.5 %	5.9 %
A-B	11.4 %	20.7 %	13.5 %	6.3 %	14.0 %
A-C	13.8 %	6.7 %	11.5 %	18.8 %	11.5 %
A-D	2.4 %	2.7 %	2.8 %	0.0 %	2.6 %
B-B	11.8 %	14.0 %	18.0 %	12.5 %	15.2 %
B-C	20.9 %	22.0 %	21.5 %	37.5 %	21.7 %
B-D	6.7 %	7.3 %	7.0 %	0.0 %	6.8 %
C-C	9.8 %	12.7 %	12.8 %	12.5 %	11.8 %
C-D	14.6 %	8.7 %	6.0 %	0.0 %	9.0 %
D-D	2.4 %	0.7 %	1.3 %	0.0 %	1.5 %
N	254	150	400	16	820

Manual selection of reviewers gave closer match than when using an algorithm. For the second Spark call, an algorithm was introduced to help assign experts to proposals.²⁹ The reviewers who were manually selected for the specific proposal they reviewed, slightly more often found the proposal to be within their area of specialization than those who were selected by the SNSF algorithm. In 2020, 57% of those who were manually selected and 53% of those who were assigned by help of the algorithm, found the proposal to be within their area of specialization, whereas 46% of those assigned with the algorithm and 42% of those selected manually found the proposal to be within their wider discipline (table below).

Table 3.12 Reviewer match to proposal topic by matching method. Spark reviews* 2020. Percentages.

Reviewer match to proposal topic	Algorithm match	Manual match	Total
'is within my area of specialization'	53.2	57.3	55.7
'is within my wider discipline'	46.2	41.5	43.3
'other'	0.6	1.2	1.0
N	639	999	1638

*Source: Data provided by the SNSF. *The sample consists of the Spark reviews in 2020, two per proposal, i.e. the units of analysis are the reviews (not the proposals or the reviewers).*

3.1.2 Blinded evaluations

Many applicants were unsure about reviewers' ability to identify applicants. While 20% of the surveyed applicants thought that the reviewers were not at all able to identify them or their research environment, 41% of the applicants did not know, and 6% thought the reviewers to a great extent were able to identify them (table below). Hence, a large part of the applicants thought the reviewers might have identified them/their research environment or were unsure if they had.

²⁹ Expert matches by the algorithm were controlled manually, non were assigned automatically.

Table 3.13 Applicants' views on reviewers' ability to identify applicants or their research environments, by approval of Spark proposal. Percentages.

Based on the anonymous review reports you received (in case of a negative decision*), to what degree do you think the reviewers who assessed your Spark proposal:	1	2	3	4	5	Cannot say/ Did not receive review	N	Mean rate (1-5)
6d) Were able to guess your identity or identify your research environment from reading your project description?	Not at all				To a great extent			
Not approved	27	17	14	14	6	23	526	2.40
Approved	7	4	5	3	6	76	286	2.87
Total	20	12	11	10	6	41	812	4.47

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

*Review reports were to be sent all rejected applicants. Funded applicants only received the report if they asked for it.

Applicants were satisfied with the double-blinded review process. Even if many applicants were unsure whether the proposals were effectively anonymized, the large majority of them expressed positive views on anonymized proposals and the double-blinded review process: 77% rated 4 or 5 on the scale from 1 to 5 when indicating their satisfaction with the double-blinded review (table below).

Table 3.14 Applicants' satisfaction with the double-blinded review process. Percentages.

Considering your Spark application, to what extent did you find the following issues and processes satisfactory?	1	2	3	4	5	Cannot say	N	Mean rate (1-5)
5g) The anonymised proposals/the double-blinded review process	Not at all				To a great extent			
Results of Spark selection process:								
Non-approved proposal	8	7	11	27	43	4	525	3,93
Approved proposal	2	2	6	15	74	2	307	4,59
Total	6	5	9	22	55	3	832	4,18

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

A minority of the reviewers reported they could identify applicants. Of the 1496 evaluated Spark proposals, the experts reported in their review report that they could identify the identity, host institution and/or career level the applicant in 125 applications (119 identifiable by one of the two reviewers, 6 identifiable by both reviewers). Hence, in 8% of the cases the applicants were reported not fully anonymous to one or both reviewers. Some commented that they could guess the university, group or the individual applicants, others that they could guess the applicant's career level (guesses which were not necessarily correct). A slightly higher percentage of the proposals within STEM (9.8%)³⁰ than within SSH (6.4%), and a slightly higher percentage of applicants above 40 years old (9.2% compared with 7.6% below 40) did not seem fully anonymized. There was no difference by gender

³⁰ Life sciences 8.7%.

of main applicants (8.4% not fully anonymized proposals in both groups). Moreover, proposals from Universities of Teacher Education and Universities of Applied Sciences were harder to identify (none of the proposals from Universities of Teacher Education and 6.7% of those from Universities of Applied Sciences were reported identifiable). In sum, proposals within STEM fields at Cantonal universities or the ETH domain, with main applicants above 40 years old, seems to have been somewhat easier to identify. Still, overall, above 90% of the proposals were reported to be fully anonymized and only 0.4% were reported guessed/identified by both reviewers.

Reviewers specialized in the area of the proposal could more often thought they could identify the applicant. From the review data for 2020, when the reviewers were asked to indicate whether the proposal was within their ‘area of specialization’ or within their ‘wider discipline’, we also see that reviewers matching the area of specialization of the proposal somewhat more often thought they could identify the identity, host institution and/or career level the applicant (7.5% compared with 5.3% of those with match to their wider discipline, table below).

Table 3.15 Reviewers’ ability to identify applicants by reviewers’ match to proposal topic. Spark proposals 2020. Percentages.

Reviewer match to proposal topic	Reviewers though they could identify the identity, host institution and/or career level the applicant			N
	None of the two	Both could	One could	
Both reviewers ‘is within my area of specialization’	92.5	0.4	7.1	254
Both reviewers ‘within my wider discipline’	94.7	0.0	5.3	150
One reviewer in wider discipline, one in area of specialization	92.0	0.8	7.2	400
Other replies	94.1	0.0	5.9	17
Total	92.7	0.5	6.8	821

Source: Data provided by the SNSF.

The reviewers had split views on the blinding of the proposals. When asked whether the blinding of proposals was conducive to supporting unconventional research, the replies from the reviewers varied. Whereas 31% replied that the blinding made little difference, 46% thought it helped supporting unconventional research. Reviewers within the social sciences and humanities more often indicated that the blinding was conducive to supporting unconventional research (Appendix 6, Question 15). Those who served as reviewer both years, more frequently replied that the blinding made little difference, indicating that those with more experiences of reviewing Spark proposals were more sceptical towards the importance of blinding the proposals (41% replied that it supported unconventional research, and 41% replied that it made little difference, Table below). Among those who answered that blinding made little difference for supporting unconventional research, some commented that the identity of the applicant should not matter:

They would usually ‘pay no attention to applicant’s identity and try to focus on science’, or that ‘a good idea should stand for itself, so blinding should ideally make little difference’. Others commented that even if blinded, there were possibilities for guessing who the applicants were, e.g. because there were few working in the field in Switzerland. Some were also concerned that the blinding could make it more difficult to assess originality and unconventionality, i.e. to assess the ‘probability of old wine in new bottles’. Furthermore, some hold that the blinding was unproductive because they could not assess applicants’ track record for novelty:

- *Although I can’t be sure, I thought I could guess who the applicant was, which in fact opposes the very idea of blind reviewing. And what if it is someone else then? Or couldn’t an applicant mimic a more successful PI?*
- *I am not sure if blinding matters for me, and sometimes I could guess the authors, sometimes they had to mask it very well, and then it is unclear if the referenced work is theirs or by others, which then interferes with understanding the novelty a bit.*
- *group quality is an important aspect (...) of judging a proposal. In the end we want value for money, unconventional ideas from people/groups with a track record of bringing fresh ideas gain a little more confidence.*

On the other hand, those who found that the blinding was helpful for unconventional research, argued that focus on project description alone helped to assess the research ideas on their own merit and avoid biases:

- *I think that psychologically there’s no way to avoid it. If you know who the person you evaluate is, it impacts your evaluation. Hence, blinding is very important in my opinion.*
- *I liked it that I had to focus only on ideas. I think that an expert in the field is able to identify unconventionality even without knowing the applicants’ track record. For a short funding period this can open up opportunities for younger, less known scholars*

Table 3.16 Reviewer Survey: Reviewers’ views on blinding for supporting unconventional research. By year(s) providing reviews for Spark. Percentages.

Overall, do you think the blinding of applicants’ identities was conducive to supporting unconventional research?	2019	2020	2019 and 2020	Total
Yes	48.8	46.9	40.7	45.9
No	7.3	8.2	8.6	8.1
The blinding made little difference	28.7	27.4	40.7	30.9
It was not really blinded – I could guess the identity of the applicant(s)	5.5	8.7	4.3	6.9
Cannot remember/Cannot say	9.8	8.7	5.6	8.2
N	164	343	162	669

Source: Spark reviewer survey 2021.

Stakeholders' views on the double-blind review

In the interviews with department heads and members of the Research Council, double-blind review processes were described as a tool for encouraging new ideas, and as to ensure that researchers were not 'judged' by their previous research track: 'Since you don't give your CV to the reviewers you are not judged by your publication record, but only judged on the idea. You can enter a new field'.

To this end, double-blind peer review would allow new research tracks. This was highlighted as one of the very positive things about Spark: 'Because the applicants felt they could have really unconventional ideas and put them forward without being punished for career issues, level issues or research field bias'.

One of the interviewees described Spark as 'a beautiful mechanism' due to the double-blind review process. This meant that young researchers would not be 'revealed' as inexperienced, avoiding a Matthew effect: 'In Spark, the stigma of not being independent is not present'.

Others pointed out that Spark should serve as a role model for other funding instruments of the SNSF due to the double-blinded review, and that they wanted this also in other instruments. Many interviewees mentioned that double-blind review should be kept for an eventual future Spark. One of them stressed the importance of generally downplaying the role of the CV and explained that also some divisions in the Research Council had been less inclined to use the CV, instead paying more attention to the project description. S/he added that how CVs are framed may also have changed, providing more room for other types of activities over publications, and downplaying the traditional standards of 'excellence' in research. Still, s/he added that blind reviews may impact the type of applicants – which do not need to be very qualified or to be trained in the field.

Still, to actually practise double-blind review could be difficult in a small country as Switzerland, where it often was easy to guess applicants' identity. This could, according to one interviewee, in the worst-case lead to reviewers' believing they know the applicant and evaluate from that. This became particularly evident in certain fields, one of them pointed out, as in most cases you would know from what lab the applications came:

'There is this kind of fashion right now that everything is to be fair and unbiased and I can understand that, but what we do is often so specialized, it is easy to know everyone. The applicants will suggest something from their previous work. You see what previous work they cite in the introduction, so you see where it comes from.'

However, another interviewee anticipated it was more difficult to guess applicants' identity because Spark encouraged new ideas:

'If I do reviews, I know the persons, and when it is blind, you know those who do research in the field and you can imagine who they are. But since Spark encourage new ideas, it is even more blind'.

Still, the effect of double-blind reviews was challenged. One interviewee said s/he was not sure whether it made a difference, though s/he liked the principle that it made reviewers pay attention to the project rather than applicant's credentials. S/he explained that even though knowing the authors could bias reviewers, knowing this could also help them understand more of the context, where this proposal came from. It was hard to say whether that was a good thing or not, s/he added. Upon the question of whether s/he thought double-blind review could have any effect on the type of applicants, s/he replied that was definitely true. A lot of post-docs s/he knew had got Spark funding, and that was 'a huge boost to them'. Also, s/he mentioned that many researchers who did not normally apply for grants approached her/him in the second round wanting to apply, and that this motivation was due to the double-blind nature of the grant:

'I think the double-blind review together with the relatively low logistical requirements [that is, less time demanded] really encouraged the early-career researchers to apply. I think that is a nice objective for the grant.'

Concerning the evaluation process besides the double-blinded review, an interviewee found difficulties with having a virtual pool of reviewers that did not meet in person. In her/his view, this made reviewers incapable of 'building a culture of evaluation'. Thus, s/he stressed that reviewers should meet – physical or online. S/he was also quite sceptical of using algorithms for matching experts to proposals, which did not work out very well, in her/his opinion.

3.1.3 Differences between the Spark calls

A main difference between the 2019 and 2020 Spark calls, was the use of an algorithm to assign reviewers – from within a reviewer pool – to the second year's proposals. Moreover, the 2020 call was restricted to one applicant per proposal – co-applicants as in 2019 were not accepted – and the terms and eligibility regulations of the instrument and the call documents was refined and clarified.

No negative impact found from algorithm assigned experts. In 2019, experts were manually matched to proposals. In 2020, the five best-suited experts per proposals were identified by an algorithm, and then validated manually. When the algorithm failed to find matching experts, or the experts declined the review request, the search was done manually. From the analysis in Section 3.1.1, we saw that reviewers who were manually selected for the specific proposal they reviewed, slightly more often found the proposal to be within their area of

specialization than those who were selected by the SNSF algorithm (Table 3.12). From the analysis in Section 2.2, we saw no significant difference in success rates between proposals with manual versus algorithm assigned experts (Table A13, Appendix 1). Moreover, we find no difference between calls in applicants' satisfaction with expertise (satisfaction controlled for approval of proposal and other background variables, see regression tables in Appendix 5, Questions 5, 6 and 9).

No measurable effect of refined regulations, except for co-applicants. The refinements of the regulations before the second call aimed to clarify terms and eligibility. The refinement and clarification of the regulations did not reduce the proportion of proposals which did not meet formal requirements. In both years 6% of the submitted Spark proposals did not pass the preliminary check by SNSF and was rejected without review (i.e. 'formal non-consideration'). We do not see any specific effect of the refined regulations on the outreach of the second call, except that co-applicants were excluded. As noted in Section 2.2, the co-applicants³¹ were older, more often had a permanent position and were full professors (compared with the main applicants). Regarding the originality and unconventionality of the proposals – as measured by the expert assessments – we find no notable difference between the calls. The proportions of top grades and lower grades on these criteria were about the same (Figure 2.1 in Section 2.1). Hence, we see no measurable effect of the exclusion of co-applicants or other refinement of the regulations on the originality and unconventionality of the proposals.

More women, more from abroad and more juniors in the second year. We see some differences in the profiles of the (main) applicants in the two years, but cannot relate this to changes in the regulations. When excluding the co-applicants from the figures, applicants appear with much the same profile regarding type of home institution, research fields, age, and whether they hold a permanent position or not, and applied for own salary or not. Still, in 2020, we see a higher percentage of women (39% vs 32%), a slightly higher percentage of junior researchers (48% vs 45%), and higher share of applicants with doctorates from abroad (60% vs. 55%, tables in Appendix 1).

Less satisfied applicants in the extra call June 2020. There were no significant differences between calls in applicants' views on the adequacy of Spark for their funding needs or the types of eligible institutions (regression tables in Appendix 5, Questions 5, 9 and 10). The only difference in applicants' satisfaction we find relates to lower satisfaction with the clarity of the terms and requirements among the applicants in the extra call June 2020. These were applicants from the March 2020 call who were asked to resubmit their proposal because of technical difficulties in anonymizing the proposals, and in the survey they expressed lower

³¹ 155 of the 720 proposals in 2019 had one or more co-applicant. See Appendix 1, Tables A1-A10 for figures on co-applicants.

satisfaction with the clarity of the terms and requirements for proposals. Hence, their dissatisfaction most probably relates to the blinding problems and resubmission, rather than the changes in the regulations of the Spark instrument.

The reviewers saw little differences between the calls. In the survey of the reviewers, those who had reviewed Spark proposals both years were asked to comment on any differences between the calls they remembered (free text replies). The large majority of those who commented had noted no differences between the calls, while a few commented that the number or content of the proposals they reviewed had been different (i.e. they were assigned more/better/poorer proposals one of the years). There were also a few who commented that process or guidance was improved (three comments) or that the payment for the review was inferior (two comments) in the second year.³²

3.1.4 Spark reviewer expertise compared with other schemes

From the survey data, expertise used to review the Spark proposals appear at about the same level as for other funding schemes. In the reviewer survey, a majority (55%) of the reviewers replied that the Spark proposals were about as difficult to review as other proposals from other funding schemes, or they indicated that the Spark proposals were easier to review (35%). Hence, it seems the level of expertise used was not inferior to what was used in other funding schemes.³³ Among the applicants, most thought the expertise used for Spark was about the same as for other SNSF funding schemes or they had no opinion.³⁴

Less reviewer proximity to proposal topic than for SNSF Project funding and Post-doc.Mobility. Compared with the two other SNSF funding schemes we have data on, a somewhat lower proportion of the Spark reviews appear to have been performed by experts matching the specific topic/field of the proposal. In 2020, 56% of the Spark reviews, 67% of the Project funding reviews and 65% of the Post-doc.Mobility reviews were within the reviewer's area of specialization (as indicated in the review form by the reviewer, table below). The largest discrepancy is found within the social sciences and humanities where 53% of the Spark reviews and 70% of the Project funding reviews were within the reviewer's area of specialization. Notably, taking into consideration that most Spark reviewers were from a predefined reviewer pool, while reviewers for Project funding and

³² The payment was the same the two years, except that the second year there was a requirement for at least two reviews to get paid.

³³ Still, some reviewers commended that they had been assigned proposals which were outside their expertise. Some had also accepted to review these, see Section 3.1.1.

³⁴ When comparing the competence of the Spark reviewers with other SNSF funding schemes, 32% of the applicants replied 'About the same', 8% 'Better', 17% 'Poorer' and the remaining 44% 'Cannot say' (Table 3.3).

Postdoc.Mobility were searched more widely, less reviewer proximity to Spark proposal topics would be expected.

Table 3.17 Reviewer proximity to proposal topic, Spark vs SNSF project Funding and Postdoc.Mobility. Replies from reviewers* in 2020 by proposal’s field of research.

Reviewer match to proposal topic	Biology and Medicine	Math., Nat. & Engin. Sciences	Social Sciences and Humanities	Total
Spark 2020				
is within my area of specialization	58.7	54.4	52.7	55.6
is within my wider discipline	40.1	45.2	46.1	43.4
other	1.2	0.4	1.2	1.0
N	673	482	486	1641
Project funding 2020				
is within my area of specialization	69.3	67.0	69.6	68.6
is within my wider discipline	30.2	32.7	29.9	31.0
other	0.5	0.3	0.4	0.4
N	2199	2379	2024	6602
Postdoc.Mobility 2020				
is within my area of specialization	60.0	67.6	65.5	64.8
is within my wider discipline	38.0	32.4	34.5	34.7
other	2.0	0.0	0.0	0.6
N	50	71	55	176

Source: Data from the review forms/reviewer’s indication of proximity. Spark data provided by the SNSF and aggregated data on Project funding and Postdoc.Mobility by the SNSF Data Team.

*The unit of analysis is the reviews (not the reviewers or the proposals).

3.2 Transparency and trust

Applicants’ satisfaction with transparency and feedback

The Spark applicants were generally satisfied with the clarity of the terms and requirements for proposals, somewhat less with the transparency of funding decisions and the feedback to applicants. 78% of the applicants indicated that they were satisfied with the clarity of the terms and requirements for proposals, 49% with the transparency regarding funding decisions and 44% with the clarity and completeness of the feedback to applicants (rating 4 or 5 on the scale from 1 to 5, table below). Those who got their proposals approved were more satisfied than those who did not – on average rating about one grade higher on both transparency of funding decisions and the feedback to applicants, and 0.7 higher on the clarity of the terms and requirements (table below). Moreover, applicants in the additional Spark call in June 2020 expressed less satisfaction with the clarity of the terms and requirements, and junior researchers were more satisfied with transparency of funding decisions and the feedback to applicants (regression table in Appendix 5, Question 5).

Better scores on transparency than for the NCCR scheme. Notably, Spark obtained higher scores from its applicants on the transparency of the funding decisions than similar scores from applicants to the SNSF’s NCCR scheme, a scheme

where funding decisions are based on less standardized selection criteria:³⁵ While non-approved Spark applicants on average rated Spark 3.0 on transparency (table below), the similar figure for NCCR applicants who did not make it to a full proposal was 2.1 (Langfeldt et al. 2021, Table 4.1).

Table 3.18 Spark applicants' satisfaction with clarity, transparency and feedback. Applicants' replies by approval of their Spark proposal. Percentages.

Considering your Spark application, to what extent did you find the following issues and processes satisfactory?	1 Not at all	2	3	4	5 To a great extent	Cannot say	N	Mean rate (1-5)
<i>A: The clarity of the terms and requirements for proposals</i>								
Non-approved proposal	3	10	16	36	33	1	526	3.87
Approved proposal	0	2	4	26	68	0	306	4.59
Total	2	7	12	32	46	1	832	4.14
<i>D: The transparency regarding funding decisions</i>								
Non-approved proposal	16	18	23	22	16	4	527	3.04
Approved proposal	4	5	13	26	40	12	307	4.06
Total	12	13	19	24	25	7	834	3.39
<i>E: The clarity and completeness of the feedback to applicants</i>								
Non-approved proposal	16	22	23	24	12	3	523	2.94
Approved proposal	6	5	15	27	30	16	306	3.84
Total	12	16	20	25	19	8	829	3.25

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

Transparency, impartiality and confidence were often perceived similar to other SNSF schemes. The Spark applicants were also asked to compare the transparency, impartiality/ethical standard of the Spark selection process and their general confidence of the process, with other SNSF funding schemes they were familiar with.³⁶ On all three items a majority replied either 'about the same' or 'cannot say/not applicable' (figure below). Among those who replied that the Spark process was better or poorer than other SNSF selection processes, the replies differed greatly between funded and non-funded applicants – the funded being far more in favour of Spark.

³⁵ The NCCR selection process is based on the discretion of evaluation panels, not pre-set rules for ranking proposals based on aggregated individual review scores.

³⁶ When asked to specify the SNSF funding which was their main reference for comparison, 52% answered Project funding, 13% Ambizione and 9% Postdoc.Mobility and the rest mentioned a variety of other schemes (table in Appendix).

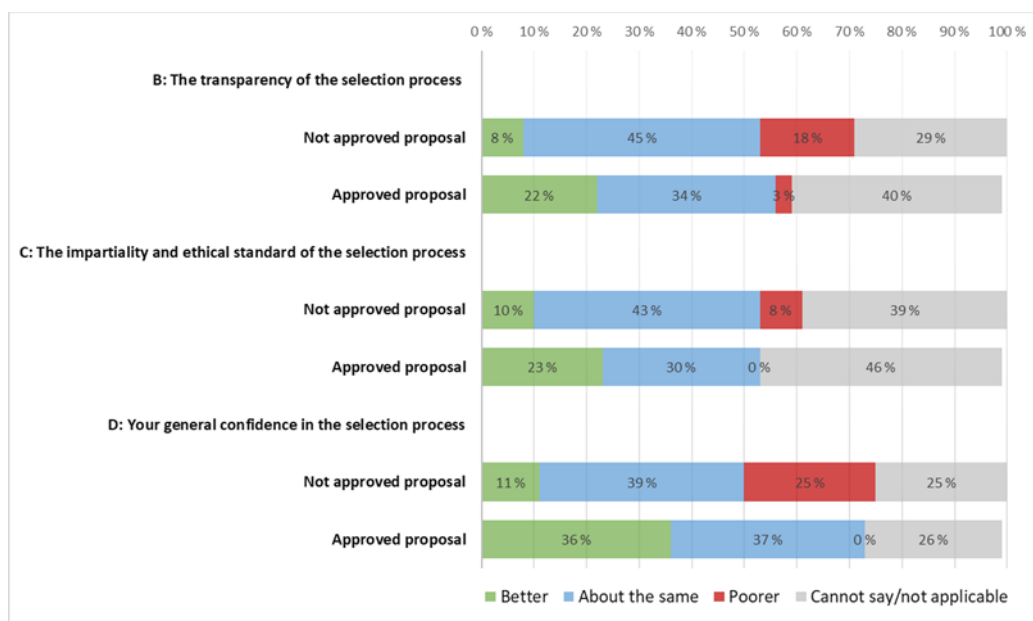


Figure 3.1 ‘Comparing the Spark pilot to other SNSF funding schemes you are familiar with, was Spark poorer, about the same or better, concerning ...’. Replies from Spark applicants, by approval of Spark proposal. Percentages. (N=790, Source: NIFU survey in 2021 of Spark applicants in 2019 and 2020 calls).

More complaints from Spark applicants in 2020 than in 2019. Taking applicants’ formal complaints about the evaluation procedure as an indicator of lack of confidence, we see little difference between Spark and the two other SNSF funding schemes we have data on – Project funding or Postdoc.Mobility. The proportion of Spark applicants who registered a complaint regarding the evaluation procedure in 2019 or 2020 was about the same as for Postdoc.Mobility and lower than for Project funding. However, in 2020 there was a substantial number of Spark applicants who registered a complaint about SNSF policies (8% of applicants in 2020 compared with 0.5% in 2019). We assume most of these related to the specific difficulties with anonymizing proposals in 2020. They may also relate to the lower success rate in 2020. In conclusion, registered complaints do not indicate lower confidence in the Spark *evaluation procedure* than for other SNSF schemes, but there is an increase in complaints in 2020, which may indicate a reduced trust in the SNSF’s policies and management of the Spark instrument.

Clarity and perceived adequacy of review criteria

Some reviewers did not embrace ‘unconventionality’ as a good criterion for the review. As noted in Section 3.1.1, the reviewers found the criteria clear and easy to understand and the proposals within their expertise. Also, when asked about adequacy of the review criteria the reviewers are generally positive. However, several were less convinced about the adequacy of the ‘unconventionality’ criterion, which

also was the criterion which appeared the most difficult to assess (see Section 3.1.1). On average the reviewers rated the adequacy of ‘unconventionality’ 3.7 on a scale from 1 to 5, while the other criteria on average are rated from 4.3 (‘potential for significant impacts’) to 4.7 (‘scientific quality of the proposed project’, table below).

Table 3.19 Reviewer Survey: Reviewers’ views on adequacy of the review criteria. Percentages.

Adequacy of the review criteria. The Spark review form asked for assessment on the following four criteria. For each of them, please indicate whether you think it is an adequate criterion when assessing proposals.	1 Not at all	2	3	4	5 To a great extent	Cannot say	N	Mean rate (1- 5)
a) Originality/Novelty of the proposed project	0	1	4	26	66	3	689	4.61
b) Unconventionality of the idea	2	9	25	38	23	3	688	3.74
c) Scientific quality of the proposed project	0	1	4	18	75	3	688	4.72
d) Potential for significant impacts	0	3	13	36	46	3	687	4.27

Source: Spark reviewer survey 2021.

The reviewers had divergent opinions on the ‘unconventionality’ criterion. A majority of the comments in the reviewer survey on the adequacy of the review criteria, concerned ‘unconventionality’. Judging from the comments, many of the reviewers perceived the unconventionality criterion and originality/novelty criterion as overlapping and hard to distinguish from each other. Moreover, some emphasized that it was hard to assess the unconventionality of the proposals, particularly if they were outside their own research field. One of the reviewers put it like this:

- *The difference between originality and ‘unconventionality’ is minimal. Or at least, I don’t understand the difference enough to merit another major category. It’s also the case that proposal outside of a reviewer’s field will be viewed as ‘unconventional’ if only because the reviewer is not up-to-date on the thinking pervasive in that field. By using ‘unconventionality’ as a metric, proposals are punished if the reviewers are in the same domain and heavily rewarded if reviewers are in different domains.*

Others did not see unconventionality as an adequate criterion when reviewing research proposals because they saw no value in unconventionality as such, and gave different reasons for this:

- *I think we should not focus so much on novelty and unconventionality. There are many great existing methods and ideas that have not been studied nearly enough. It is absolutely valuable to look at these with new data or in new context. For example, in my field [...] the incentives are already tilted too much towards novelty and surprising findings, and we see too little replication. This is not productive and funding instruments should not contribute to these bad incentives.*

- *S[ome] of the proposals I read were flat out weird – I really couldn't see them being fruitful ideas. But they would score highly on the unconventionally criterion. I feel that the originality/novelty criterion captures this idea adequately.*

Contrary to this, others were enthusiastic about unconventionality:

- *I think the criteria are excellent. [...] I think it is very important that some funders give high marks to this criterion as unconventional ideas of very high scientific quality and importance often struggle to get funded.*
- *This is an excellent opportunity provided by the SNF to fund 'unconventional' and 'blue sky' ideas that would otherwise not stand the chance of scrutiny / risk assessment of conventional grant application schemes.*
- *important to give new, unconventional ideas a chance to be followed even if they do not fit into a specific, defined field of research*

In sum, the reviewers had divergent opinions about unconventionality as a criterion for assessing research proposals. They probably interpreted and used the criterion differently, which may have impacted the grades given on this criterion.

Clarity and outcome by number of review assignments

Grades and outcome did not vary by number of review assignments. We find little evidence that the grades given or the outcome of review differed by the number of reviews the reviewers performed. In 2019, those who reviewed more than one Spark proposal somewhat more often gave top overall score (A), while in 2020 they somewhat less often gave top overall score. In neither year is the difference statistically significant (Table A 21 in Appendix 1). Nor does the proportion of approved proposals differ between those who reviewed one or more proposals (table below). Still for 2019, we find significant difference for the grades on unconventionality. Those who reviewed multiple proposals in 2019 somewhat less often gave top grade on unconventionality (19% of reviews from those with multiple reviews and 24% of those from with single assignments rated A, Table A 22 in Appendix 1). Still, in 2020, there was no significant difference, and more strict grades on unconventionality from those with multiple reviews do not seem to be a persistent issue.

Table 3.20 Proposal outcome by number of reviews the reviewer performed, by year. Spark reviews.* Percentages.

Year	Approved proposal	Reviewed Spark proposals that year		Total
		1	>1	
2019	No	59.9 %	58.9 %	59.3 %
	Yes	40.1 %	41.1 %	40.7 %
	N	509	841	1350
2020	No	88.5 %	87.2 %	87.7 %
	Yes	11.5 %	12.8 %	12.3 %
	N	610	1030	1640

Source: Data provided by the SNSF. *The sample consists of the Spark reviews in 2020, two per reviewed proposal, i.e. the units of analysis are the reviews (not the proposals or the reviewers).

Those who reviewed multiple Spark proposals found the task less difficult. In the survey, a majority (55%) of the reviewers replied that the Spark proposals were about as difficult to review as other proposals they had reviewed (i.e. proposals from other funding schemes). Moreover, a substantial proportion of the reviewers indicated that the Spark proposals were easier to review, and very few indicated that they were more difficult to review. In sum, this indicates that the review task was clear to the reviewers. Even if the proposals were blinded and review criteria differed from other schemes, overall, they did not find Spark proposals more difficult to review. Notably, reviewers who reviewed multiple Spark proposals more often found the task less difficult (14 percentage points more replying less difficult, table below).

Table 3.21 Reviewer Survey: Difficulty of review compared with other funding schemes. By number of Spark proposals reviewed. Percentages.

Compared to grant proposals you have reviewed for other funding schemes, was/were the Spark proposal(s) less, about the same or more difficult to review?	Spark proposals reviewed		
	One	More than one	Total
Less difficult	30.3	43.8	34.6
About the same	58.7	48.4	55.4
More difficult	2.2	5.5	3.2
Cannot remember/Cannot say	4.5	0.9	3.4
Not applicable, I have not reviewed other grant proposals	4.3	1.4	3.4
N	465	219	684

Source: Spark reviewer survey 2021.

3.3 Resources and management

Application and review time

Applicants were generally satisfied with the time and effort needed to prepare a proposal and the support from the SNSF. A majority of the applicants answered positively when asked about the time and effort needed to prepare a proposal and the support from the SNSF during the application process. On both items, their

average score is 4 on a scale from 1 to 5 (table below). Applicants who did not get their proposal funded are less satisfied, still on both items average score is above 3.5 in this group.

Table 3.22 Applicants' satisfaction with application time and support. Percentages.

	1 Not at all	2	3	4	5 To a great extent	Cannot say	N	Mean rate (1-5)
Considering your Spark application, to what extent did you find the following issues and processes satisfactory?								
B: The support during the application process from the SNSF								
Non-approved proposal	5	9	18	25	23	20	526	3.67
Approved proposal	0	0	9	21	57	13	307	4.53
Total	3	5	15	23	36	17	833	4.00
F: The time and efforts needed to prepare a proposal								
Non-approved proposal	2	6	26	46	19	1	525	3.75
Approved proposal	0	1	10	36	52	0	307	4.40
Total	1	4	20	42	31	1	832	3.99

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

A majority of the applicants used less time on their Spark proposal than for proposals to other SNSF schemes. When asked to compare how much time they used on their Spark proposals compared with other proposals they had submitted, 46% of the applicants answered that they used less time. Since 22% answered that they could not say, or had not submitted other grant proposals, 46% answering 'less time' implies that the vast majority of applicants with an opinion found that a Spark proposal was less time-consuming than other proposals (table below).

The funded applicants somewhat more often replied that they used less time on Spark, but when controlled for other background variables³⁷ in a regression analysis, the difference between funded and non-funded is not significant. Moreover, replies do not differ significantly by field of research, gender, position, or call/year (table in Appendix 5, Question 8).

Table 3.23 Compared to grant proposals you have submitted to other SNSF funding schemes, did you spend less, about the same or more time on preparing your Spark proposal? Applicants' replies by proposal results. Percentages.

Proposal	Less time	About the same time	Vary/Less and more*	More time	Do not re- member / Cannot say	Not appli- cable**	N
Non-approved	43.2	23.8	8.6	1.8	2.3	20.3	512
Approved	51.0	18.9	8.6	1.0	1.7	18.9	302
Total	46.1	22.0	8.6	1.5	2.1	19.8	814

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

* 'Less than some but more than other grant proposals I have submitted'

** Not applicable, I have not submitted other grant proposals to the SNSF

³⁷ Controlled for field of research, gender, position, or call/year, see table in Appendix 5, Question 8.

Those who reviewed multiple Spark proposals spent relatively less time. In the survey, a majority of the reviewers (60%) replied that they spent about the same time on reviewing the Spark proposals as proposals from other funding schemes, and 29% that they spent less time. Very few indicated that they spend more time. Reviewing multiple Spark proposals seem to have eased the task: Reviewers who reviewed multiple Spark proposals more often replied that they used less time than for other funding schemes (11 percentage points more replying less time, table below).

Table 3.24 Reviewer Survey: time for review compared with other funding schemes. By number of Spark proposals reviewed. Percentages.

Compared to grant proposals you have reviewed for other funding schemes, did you spend less, about the same or more time (on average) on reviewing the Spark proposal(s)?	Spark proposals reviewed		
	One	More than one	Total
Less time	25.2	36.1	28.7
About the same time	62.7	54.8	60.2
More time	3.0	6.4	4.1
Cannot remember/Cannot say	4.5	1.4	3.5
Not applicable, I have not reviewed other grant proposals	4.5	1.4	3.5
N	464	219	683

Source: Spark reviewer survey 2021.

Different views on short proposals. The free text explanations about the time spent on reviews varied greatly. Some explained that they spent less time on the Spark reviews because the proposals, and feedback requested, were shorter, and there was no panel meeting. Still, some explained that they spent more time because shorter proposals were hard to assess, or because of more demanding review criteria or proposals outside their field. Hence, for some the short proposals made them easier to review, while some found them harder than the longer proposals in other funding schemes:

- *The shorter project descriptions limited the depth and led to key information being omitted from the application. This made it harder to judge quality.*
- *More time because less details in the proposal.*
- *The time saved resulted from the fact that we were only given the core content of the proposal and were thus not asked to comment on details of the work programme, project logistics or budgeting.*
- *Even though the topics were further from my discipline, the proposals were less difficult to review because they generally contained fewer technical details.*
- *I spent less time because the proposal was short and followed a precise schema and especially because the project was necessarily simple in its internal articulation due to the limited time frame. The way my feedback was requested was also easy to comply with.*

Several also explained that the various factors evened out and that they spent about the same time as for reviewing other proposals:

- *things balanced out – the proposals tended to be short and crisp but perhaps more time was spent trying to figure out whether they were actually novel or not.*
- *Although I spent a good deal of time trying to determine the originality/unconventionality of the proposal, the smaller amount of material in the proposal (with respect to those I normally review) meant that the total amount of time I spent on the review was around the average.*

Administrative resources and organization

Long timeline for expert search. The SNSF's administrative work and resources for organizing the review of the Spark proposals differed from other SNSF schemes, both in terms of workload and the duration of the tasks. As there were no panel meetings, time for organization and execution of meetings was saved – in terms of cutting timeline as well as administrative work. Still, establishing the pool of experts/searching additional experts, and allocating experts to a large number of proposals extended the timeline more than what was saved from omitting review panel meetings. Aggregating the estimated timeline for the various administrative work steps, we see that while SNSF Project funding adds up to 20 weeks, and Postdoc.Mobility to 14 weeks, Spark adds up to 31 weeks: 3.5 weeks for preliminary check of proposals, 20 weeks for expert search and 8 weeks for decision making and communication (based on estimates from the SNSF, table below). Notably, these figures are based on a double timeline for Spark in 2020 – because about 30% of the proposals had anonymity problems and were resubmitted to an extra call and caused more administrative work for this year. If we count 2020 as two calls and calculate the average time (for in total three calls), we get lower numbers per call, e.g. the time for searching experts per Spark call would be 14 weeks, not 20 weeks. Still, 14 weeks for search experts is more than for Project funding, which on average spent 9 weeks on this.

Lower administrative costs than SNSF Project funding when measured relative to number of proposals, higher when measured relative to budget. Measured in estimated administrative workload *per call*, Spark was less resource-demanding than SNSF Project funding, and not very different from Postdoc.Mobility. Resources spent varied somewhat by administrative tasks: A little fewer resources were spent on preliminary check of proposals than in the two other SNSF schemes. A little fewer resources were spent on expert search than in Project funding, still substantially more than in Postdoc.Mobility – which in most cases do not use external experts. Much administrative resource was saved on omitting panel meetings, and also for decision making and communication Spark comes out with lower

administrative cost per call. In total, each Spark call demanded on average 397 FTE weeks in the SNSF administration, while Postdoc.Mobility demanded 440 and Project funding 748 (based on estimates from the SNSF, table below). Still, when we measure costs relative to grant budgets, Spark comes out as less cost effective than Project funding: Spark demanded 22 FTE weeks per funded million CHF, while Project funding demanded 10 FTE weeks (and Postdoc.Mobility demanded 61 FTE weeks, table below). On the other hand, when measured per proposal, Spark comes out with lower costs than Project funding and Postdoc.Mobility (Spark 0.5 FTE weeks per proposal compared with Project funding 2.4 and Postdoc.Mobility 3.0 FTE weeks per proposal).

Table 3.25 SNSF resources for proposal review, average figures per call for Spark, Project funding and Postdoc.Mobility. Duration of processes in weeks and full-time equivalent SNSF positions, SNSF estimates for 2019 and 2020.

	Project funding*	Postdoc Mobility	Spark
N proposals	314	148	816
% of proposals funded	37.2	43.9	23.5
Total budget granted (CHF)	72 686 290	7 241 776	18 451 267
CHF per funded proposal	619 596	111 412	96 100
a) Duration in weeks, by work step at SNSF			
Preliminary check	3.2	3.5	3.5
Expert search	8.7	0.3	****20.0
Meeting organization and execution	4.7	3.0	0.0
Decision making and communication	3.8	7.0	8.0
Total weeks duration of process	20.3	13.8	31.5
b) FTE SNSF officers per stage**			
Preliminary check	10.1	9.3	7.6
Expert search	7.3	4.0	2.5
Meeting organization and execution	11.1	9.3	0.0
Decision making and communication	8.3	9.3	2.5
Total FTE positions by SNSF officers	36.8	31.9	12.6
c) FTE weeks by SNSF officers***			
Preliminary check	31.9	32.6	26.6
Expert search	63.4	1.1	50.0
Meeting organization and execution	51.8	27.9	0.0
Decision making and communication	31.8	65.1	20.0
Total FTE weeks by SNSF officers	747.9	439.6	396.9
Average FTE weeks per proposal	2.4	3.0	0.5
Average FTE weeks per mill CHF granted	10.3	60.7	21.5

Sources: Estimates by the SNSF, averages per call.

*Figures are average of the estimates from SNSF Divisions 1, 2 and 3.

**Full time equivalent SNSF officers for the duration of each work step.

*** Includes work by scientific, financial and administrative officers. Calculated based on a) and b) with all decimal places.

**** Spark figures are based on the average of resources and time for 2019 and 2020 counting as two calls. Hence, the two calls in (March and June) 2020 count as one call. If splitting the figures on three calls the average time for searching experts per call would be 14 weeks, not 20.

Lack of sufficient software for handling a great number of applications and secure anonymized proposals. In the SNSF administration, the piloting of Spark was perceived as far more demanding than the administration of their other funding schemes, both because of the great number of submitted proposals and limitation

on the ICT tools available. Interviewees explained that their tools were not dimensioned for such big quantities of submissions as in Spark. The tools were not easy to adapt and part of the work with handling the proposals had to be done manually or in new tools developed on the side of the system. Compared with the two other funding instruments, these new tools helped to reduce the workload for the preliminary check of proposals and for decision making and communication. Still, lack of adequate software increased the amount of work in the SNSF administration. Also, for the second call, there were problems with non-anonymized proposals. The problems with securing double-blinded review resulted in about 30% of the proposals being resubmitted in an additional call. Hence, an extra call had to be organized and much work repeated within a short timeframe.

The piloting of Spark caused more work within the SNSF Administrative Office. In addition to Spark being a new scheme with new procedures, which attracted more proposals than other schemes, and did not have adequate ICT tools, Spark also caused additional work because a large part of the applicants were new to the SNSF. These applicants asked more questions and needed more support in the application phase and in the follow-up of funded projects. To some extent, Spark served as helping and training new applicants and grantees for the SNSF – which presumably would be helpful for them also for later/other SNSF schemes. However, the Spark budget and grants were small, and compared with the allocated grants Spark demanded much administrative work.

Difficulties with finding the right experts for evaluating Spark proposals. The large number of proposals also added to the problem of finding reviewers to all proposals. The recruited pool of experts had to be enlarged for the first call. For the second call, many of the same reviewers could be used and this saved some time. Moreover, for the second call, an algorithm was developed to match reviewers to proposals. All matches were still checked manually, and the algorithm worked less well in some fields, hence the algorithm did not save as much time as hoped. In our interview with the SNSF administration, it was stressed that the biggest challenge with the many proposals was to find the right experts for assessing each of them.

Lifetime management of the Spark projects

Same management of funded projects as for other SNSF schemes. The SNSF have followed up Spark funded projects much the same way as for other SNSF funding schemes. This includes checking documents before release of funds, follow-up on employment of project staff or extensions of the project period and checking reports before project termination.

Fewer resources for lifetime management than Postdoc.Mobility. The administrative costs on the management of Spark projects compared with SNSF Project

funding and Postdoc.Mobility, comes out very differently depending on whether we compare by the size of the schemes in terms of the total amount funded or the number of funded projects. Spark had higher estimated administrative costs than SNSF Project funding when measured relative to the amount funded, but lower when measured relative to the number of projects (FTE weeks per funded project: Spark 0.3 and Project funding 0.6; FTE weeks per funded mill CHF: Spark 3.5 and Project funding 1.0). Compared with Postdoc.Mobility, Spark comes out lower on both measures (table below). In sum, taking the small size grants into consideration, SNSF's estimated resources for follow-up of the grants may seem high compared with what is spent on SNSF Project funding. Still, comparing with Postdoc.Mobility, Spark seems to demand less resources on follow up of project, both in terms of FTE weeks per funded project and per funded mill CHF.

Table 3.26 Estimated resources for SNSF's management of funded projects from project start through to scientific and financial reports and follow-ups ('lifetime management'), average figures per call for Spark, Project funding and Postdoc.Mobility. Duration and full-time equivalent SNSF positions, SNSF estimates for 2019 and 2020.

	Project funding*	Postdoc Mobility	Spark
Number of funded projects	117	65	192
Total budget granted (CHF)	72 686 290	7 241 776	18 451 267
a) Duration in weeks, at SNSF***	208	9	52
b) FTE SNSF officers per stage**			
SNSF Scientific officers	0.1	2.5	0.3
SNSF fin. and admin. officers	0.2	5.8	0.9
c) FTE weeks			
SNSF Scientific officers	22.9	22.5	15.6
SNSF fin. and admin. officers	49.2	52.2	48.4
Total FTE weeks by SNSF officers	72.1	74.7	64
Average FTE weeks per funded project	0.6	1.1	0.3
Average FTE weeks per mill CHF granted	1.0	10.3	3.5

Sources: Estimates by the SNSF, averages per call.

*Figures are average of the estimates from SNSF Divisions 1, 2 and 3.

**Full time equivalent SNSF officers for the duration of each work step. Calculated based on a) and b) with all decimal places.

***Duration in weeks does not necessarily correspond with the duration of the projects.

3.4 Selection processes and framework – Summary results

Double-blinded review

The applicants were satisfied with the double-blinded Spark review procedure, but many were unsure about the reviewers' ability to identify them. A large part (41%) of the applicants were unsure about whether the reviewers could guess their identity, and only 20% thought the reviewers 'not at all' could guess their identity or research environment from reading the project description. Still, the applicants were supportive of the double-blinded review procedure. 77% used the positive

side of the scale when rating their satisfaction with the anonymous proposals and the double-blinded review procedure.

Reviewers specialized in the area of the proposal slightly more often thought they could identify the applicant. Reviewers matching the area of specialization of the proposal somewhat more often reported to be able to identify the applicant, even if the proposals were anonymized. Still, only a minority reported to be able to do so: 7.5% of reviewers in the ‘area of specialization’ of the proposals and 5.3% of those in the ‘wider discipline’ reported to be able to identify the applicant’s identity, host institution and/or career level. Junior scholars and applicants from Universities of Applied Sciences could less often be identified.

The reviewers had split views on the blinding of the proposals. When asked whether the blinding of proposals was conducive to supporting unconventional research, 46% of the reviewers thought it helped supporting unconventional research, while 31% replied that the blinding made little difference and 8% thought it was negative. Among the latter, some commented that blinding could be unproductive because reviewers could not assess applicants’ track record for novelty. Stakeholders in the research organizations described the blinding as a tool for allowing new research tracks because the researchers were not ‘judged’ by their previous publication record. It could also avoid a Matthew effect, giving young researchers an opportunity to get funded.

Review criteria

The reviewers generally found the criteria clear and easy to understand, but had divergent opinions on unconventionality. While the reviewers found the review criteria clear and easy to understand, some did not embrace ‘unconventionality’ as a good criterion for the review. It was noted that ‘unconventionality’ was difficult to assess especially when the proposal was not in the reviewer’s field of expertise. Some indicated that it was particularly challenging to distinguish the unconventionality criterion from the originality/novelty criterion. Other reviewers were sceptical about the impact criterion, emphasizing that potential impacts are difficult to predict and assess, especially in original projects.

Reviewer competences and match to field of proposal

The reviewer pool contained experienced, senior scholars. Nearly all the reviewers had previous grant review experiences, a large part were full professors or lead researchers/similar, and most were located in North America, Australia or Europe. Compared with the applicant population, the reviewer population was older and more male dominated.

Applicants' satisfaction with the reviewer competences did not differ much from other schemes. On a scale from 1 to 5, the non-funded Spark applicants on average rated the reviewers' ability to assess all the fields in the proposal, giving a thorough and open-minded/unbiased review, around 3, whereas the average rate from the funded applicants was around 4.4 on these questions. The applicants' rates of reviewer competences are not inferior to what other schemes previously have obtained on the same questions.

The reviewer competences were matched to the proposals. In the survey, most reviewers indicated that the Spark proposals were close to their field of expertise and a substantial proportion replied that they were easier to review compared with proposals from other funding schemes. Very few indicated that the Spark proposals were more difficult. Those who reviewed multiple Spark proposals found the task less difficult than in other schemes, but grades and outcome did not differ by number of review assignments. Even if the proposals in most cases were close to the reviewers' field of expertise, they were often not *within* their field of expertise. In the 2020 call, about half of the proposals were assessed by one expert who indicated that the assigned proposal was within his/her area of specialization and one expert who indicated that it was within his/her 'wider discipline', while 31% were assessed by two experts who indicated that the assigned proposal was within their area of specialization, and 18% were assessed by two experts who indicated that it was within their 'wider discipline'³⁸.

Manual selection of reviewers gave a closer match than when using an algorithm. The reviewers who were manually selected, slightly more often found the proposal to be within their area of specialization than those who were selected with help of the SNSF algorithm. Still, when controlled for other variables, there were no significant difference in success rates between proposals with manual versus algorithm matched experts.

Reviewers evaluating proposals within their area of specialization more often disagreed on unconventionality. When one or both reviewers indicated that the proposal was within their area of specialization, there was more often a gap by two or three grades between their reviews. The most notable difference is for the scores on unconventionality. Hence, a lower proportion of the proposals with two 'specialist' reviewers ended up with a combination of grades that was above the 'hard' funding line in 2020 (only overall grades AA or AB were funded).

Transparency

Clear terms and requirements. The Spark applicants were generally satisfied with the clarity of the terms and requirements for proposals. They were somewhat less

³⁸ See Table 3.7. There is no data on this for the 2019 call.

satisfied with the transparency of funding decisions and the feedback to applicants. Still, Spark got better scores on transparency compared with the NCCR scheme, and compared with other SNSF funding schemes we have data on, there is little difference in formal complaints from applicants. There were, however, more complaints about Spark in 2020 than in 2019. We assume this to be related to difficulties with anonymizing proposals and a lower success rate in 2020.

Time and resources

Less time- and resource-demanding for the applicants. Most of the applicants used less time on their Spark proposal than for proposals to other SNSF schemes (counting those with previous experiences/able to answer the questions), and they were generally satisfied with time and efforts needed to prepare a proposal.

Reviewer time varied. The majority of the reviewers spent the same or less time on reviewing Spark proposals than other proposals. One reason for spending less time was that the Spark proposals were shorter. Still, some reviewers spent more time. The free text explanations about the time spent on the reviews varied greatly: some spent more time because shorter proposals were perceived as harder to assess, others due to more demanding review criteria or because the proposal was outside their field.

Lower administrative costs than SNSF Project funding and Postdoc.Mobility when measured relative to number of proposals. Concerning administrative resources at the SNSF, Spark had higher administrative costs than SNSF Project funding when measured relative to budget, but lower costs when measured relative to number of proposals. When comparing with Postdoc.Mobility, Spark had lower administrative costs both when measured relative to number of proposals and to budget.

The administration lacked sufficient software for handling a great number of applications and secure anonymized proposals. In the SNSF administration the piloting of Spark was perceived as far more demanding than their other funding schemes, due to a great number of submitted proposals, lack of ICT tools available, and because a large part of the applicants were new to the SNSF.

4 Spark in the Swiss research funding landscape

To fit well in a national funding landscape and contribute to the overall strategies of a funding agency, a new funding scheme should serve defined needs and fill gaps between existing funding instruments. In this chapter we look at how the Spark instrument integrated into the Swiss research and funding landscape and stakeholders' views on the need for a Spark kind of funding instrument.

4.1 Characteristics of Spark projects

Spark filled different needs for different groups of applicants. As outlined in Section 2.2, the majority of the Spark project ideas were developed before the Spark call and/or they did not fit other funding schemes. We also saw that applicants who got their Spark proposal approved more often (than the non-approved applicants) had applied because they saw Spark as an opportunity to address ideas with limited basis in previous research and to test high-risk/high impact ideas. When we furthermore split the motivations for the proposals by whether the applicants had received prior funding for the proposed project from their home institution or not, we see that those with such prior funding more often were motivated by the possibility of being assessed exclusively on the project description and saw it as an opportunity to address interdisciplinary research ideas. And, as would be expected, those with such prior funding more often applied funding for a project idea developed before the Spark call (table below).

Table 4.1 Spark applicant survey: Motivations to apply for Spark by prior funding to the project from own institution and by Spark proposal approval, means on a scale from 1 'Not at all' to 5 'To a great extent'.

Q1 Why did you apply for a Spark grant? Please indicate your motivations on the scale from 1 to 5.	No prior funding from home inst. (Q2)			With prior funding from home inst. (Q2)*		
	Funding from Spark			Funding from Spark		
	No	Yes	Total	No	Yes	Total
a) I needed funding for a project idea which was developed before I learnt about Spark	3.40	3.60	3.47	4.11	3.91	4.01
b) I developed a new project idea that was motivated by the Spark call.	2.97	3.02	2.98	2.42	2.72	2.56
c) It was an opportunity to address ideas with limited basis in previous research	4.17	4.42	4.26	4.31	4.13	4.22
d) It was an opportunity to test high-risk/high impact research ideas.	4.07	4.46	4.21	4.03	4.34	4.18
e) It was an opportunity to address interdisciplinary research ideas.	3.45	3.55	3.48	3.78	3.97	3.87
f) The project did not fit to other funding instruments of the SNSF.	3.66	3.67	3.66	3.66	3.42	3.54
g) I was motivated by the possibility of being assessed exclusively on the proj. descrip.	3.72	3.91	3.78	4.51	3.91	4.22
h) I saw the proposal/project as a step in building an academic career.	3.67	3.83	3.73	3.69	3.68	3.69
i) My colleagues/head of lab/department encouraged me to apply for a Spark grant	2.95	3.06	2.99	3.00	2.50	2.77
j) I had a project that needed to be implemented fast.	3.15	3.03	3.11	3.54	3.09	3.33

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls). See Table 2.18 for percentages.

* These are applicants who in the survey indicated 'I had already obtained some funding for the project from my/our home institution(s)'.

The Spark projects were perceived not to fit other funding instruments due to novelty, limited preliminary data, riskiness, and eligibility. When asked why the project did not fit to other funding instruments of the SNSF, most respondent answered that this was due to the novelty and unconventionality of the idea, the limited preliminary data or the riskiness of the project (table below). The novelty and riskiness of the project were less frequently mentioned by researchers within SSH. Also, female researchers less frequently mentioned the riskiness of the project. Researchers in temporary positions and those with non-approved proposals more often indicated that the project did not fit other calls due to eligibility (table in Appendix 5, Question 1b). Of those who indicated other reasons (than the predefined categories in the questionnaire) for which their project did not fit other funding schemes, many commented that they were postdocs/on a temporary contract or other reasons why they were not eligible for (few other) SNSF grants. Others explained that it was a kind of research that had small chances in other schemes or that they had small chances in other schemes because they did not have a CV in the field of the proposals.

Table 4.2 Spark applicant survey: Why the Spark project did not fit other SNSF funding instruments, by approval of Spark proposal. Percentages.

You have indicated that your project did not fit to other funding instruments of the SNSF. Please indicate the reason(s) for this (multiple replies possible):	Not approved	Approved	Total
Due to the novelty and unconventionality of the idea	63.0	58.8	61.5
Due to the limited preliminary data	58.4	60.6	59.2
Due to the riskiness of the project	44.8	55.8	48.6
Due to the limited duration and budget	28.9	26.7	28.1
Due to my eligibility: I was not employed by an institution eligible for other SNSF funding	25.0	19.4	23.0
It was at the intersection between SNSF and Innosuisse/ basic and applied research	14.0	15.2	14.4
Other	14.3	17.6	15.4
N	308	165	473

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

A majority of the applicants had not applied for any other funding for the project. When asked about funding *prior* to the Spark Call, 62% of the applicants replied they had not applied for any other funding for the project, while 8% answered that they had obtained some funding from their home institution, and 7% indicated that the project had obtained funding from sources other than the SNSF or the home institution. Moreover, 12% indicated that they were hired on a project (i.e. not principal investigator) that was the basis for the Spark proposal. Very few (2%) reported that they had previously obtained funding from the SNSF for the project (table below). Having already obtained funding from home institutions was more common among those who got their Spark application approved (11% of those who obtained Spark funding had prior institutional funding for the project, while 7% of those with non-approved Spark proposals had such funding, table below).

Approved Spark projects more often received funding from their home institution or other sources than SNSF. Regarding funding *after* the Spark call, 14% of the applicants replied that they had obtained funding from their home institution and 14% that they had obtained funding from sources other than SNSF. Funding from the home institution was more common for those with approved applications: while 22% of the funded Spark projects obtained funding from their home institutions after the Spark Call, only 10% of the rejected Spark projects obtained such funding. Moreover, non-approved Spark projects more often unsuccessfully applied for funding from other SNSF funding schemes or from other sources than the SNSF (table below). Junior researchers more often replied that their home institution had provided funding for the project and that they were hired on a project where they could follow up their Spark project (tables in Appendix 5, Question 2b).

Table 4.3 Spark applicant survey: Other applied and/or received for the projects, before and after the Spark call. By outcome of Spark proposal. Percentages.

What other funding have you applied and/or received for the project? (multiple replies possible)	Not approved	Approved	Total
Prior to the Spark call:			
I had not considered applying for any other funding for the project	62	61	62
I had unsuccessfully applied for funding from (an)other SNSF	10	8	10
I had unsuccessfully applied for funding from funding sources other than SNSF	14	14	14
I had already obtained some funding from my/our home institution(s)	7	11	8
I had already obtained some funding from (an)other SNSF funding scheme	2	3	2
I had already obtained some funding from other funding source(s)**	7	7	7
I was hired* on a project that was the basis for the Spark proposal	12	11	12
After the Spark call			
My home institution(s) provided funding for the project	10	22	14
I have unsuccessfully applied for funding from other SNSF funding schemes	7	4	6
I have unsuccessfully applied for funding from funding sources other than the SNSF	14	8	12
I have obtained funding from other SNSF funding schemes	3	4	3
I have obtained funding from funding sources other than the SNSF	14	14	14
I was hired* on a project where I can/could follow up my Spark project	5	9	6
Other**	42	38	41
N	559	311	870

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

**Other than home institution or SNSF.

*Please include projects where you are/were not principal investigator in this category.

** A large proportion of the applicants used the open field in the survey to explain on other funding – and particularly on the lack of funding – of their Spark project. Many explained that they had received no funding, had to drop the project, or put it on hold. Some had left university. Others explained that they had applied for other funding after the Spark call but not knew the result yet, or that their Spark project was ongoing and/or that they planned to apply for additional funds.

Spark proposals were often inspired by the applicants' previous work, and in one third of cases directly building on PI's earlier project. When asked how the Spark proposal linked to the applicants' previous work, 76% of the respondents answered that it was inspired by previous work, while 33% of the respondents indicated that the Spark proposal directly built on an earlier project where they were the principal investigator (answering 4 or 5 on a scale from 1 to 5, table below). Few respondents answered that the Spark project was built on a previous project proposal that was adapted to fit the Spark call. 67% indicated that this was not at all the case (answering 1 on a scale from 1 to 5, table below).

Funded projects had more often a need for acquiring new competences. Many respondents indicated that they had to acquire new competence for the Spark project (46% indicated 4 or 5 on a scale from 1 to 5, table below). When controlled for the other background variables in a regression model we saw that the need to acquire new competence for the Spark project was more common for the researchers who got their applications approved than those with declined proposals (table in Appendix 5, Question 4).

In most cases, Spark projects could be done in parallel with other projects. 61% of the applicants replied that they could work in parallel with their other projects alongside the Spark project, while 14% answered that they had to put their other

projects on hold, and 9% that they had to/would have to resign from other projects (answering 4 or 5 on a scale from 1 to 5). Applicants with approved proposals less frequently responded that they could work parallel with Spark and their other projects. Younger researchers more frequently answered that they had to put their other project(s) on hold or resign from them, while being able to work in parallel with the Spark project and other projects was more common among female than male respondents (table in Appendix 5, Question 4).

Table 4.4 Spark applicant survey: How the applied projects were linked to applicants' other research. By outcome of Spark proposal. Percentages.

In what way was the Spark project you applied for linked to your other research?	1 Not at all	2	3	4	5 To a great extent	Cannot say/not applicable	N	Mean rate (1–5)
A: It was inspired by my previous research								
Not approved	6	5	11	27	50	0	534	4.09
Approved	3	7	13	28	48	0	305	4.11
Total	5	6	12	27	49	0	839	4.10
B: It built directly on previous project(s) where I was the principal investigator								
Not approved	29	13	14	14	21	9	532	2.83
Approved	28	18	20	12	16	6	304	2.66
Total	29	15	16	14	19	8	836	2.77
C: It built directly on previous project(s) where I was not the principal investigator								
Not approved	43	15	12	14	11	5	526	2.31
Approved	40	16	18	12	10	6	304	2.32
Total	42	15	14	13	10	5	830	2.31
D: It was part of/closely linked to my overall research agenda								
Not approved	7	13	16	29	34	1	531	3.70
Approved	5	10	18	36	30	0	305	3.77
Total	6	12	17	32	32	1	836	3.72
E: It was part of an overall project for which I/my group had obtained other research funding/grants								
Not approved	51	20	10	9	6	4	527	1.97
Approved	51	21	11	10	4	3	302	1.92
Total	51	20	10	9	6	4	829	1.95
F: It built on a previous project proposal which was adapted to fit the Spark Call								
Not approved	68	11	8	6	4	4	527	1.63
Approved	67	13	7	7	5	2	302	1.67
Total	67	12	7	6	4	3	829	1.65
G: It was a continuation of my postdoc project								
Not approved	62	10	8	7	7	7	527	1.80
Approved	63	11	10	8	4	5	302	1.73
Total	62	10	8	7	6	6	829	1.77
H: I had (or would have) to acquire new competences for the Spark project								
Not approved	21	11	23	23	19	4	527	3.09
Approved	13	12	22	32	20	1	302	3.34
Total	18	11	23	27	19	3	829	3.18
I: I had (or would have) to resign from (an)other project(s) to work on the Spark project								
Not approved	66	13	8	5	4	5	527	1.62
Approved	63	12	9	6	3	7	303	1.65
Total	65	12	8	5	4	6	830	1.63
J: I had (or would have to) put other projects on hold to work on the Spark project								
Not approved	47	18	15	10	4	5	526	2.01
Approved	43	18	20	9	5	5	302	2.10
Total	46	18	17	9	5	5	828	2.04
K: I (could have) work(ed) in parallel with the Spark project and (an)other project(s)								
Not approved	6	8	16	30	35	4	530	3.83
Approved	9	14	22	24	28	3	304	3.51
Total	7	10	18	28	33	4	834	3.71

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

Stakeholders' views on the role of Spark in the Swiss research funding landscape

Stakeholders were overall very satisfied with Spark. In the stakeholder interviews, (with Department/lab head and/or member of Research Council) one interviewee explained that the advantage of Spark compared with Project funding was that the Spark application was short and more open, while Project funding applications demand months of preparation. S/he pointed out that there are other types of career funding for younger researchers, but not a lot for funding projects, and that Spark was favourable in that way. Also, in her/his opinion, Spark could be a well-suited instrument for researchers with unconventional academic track records. S/he exemplified with her/his own field, where people often moved back and forth between academia and other sectors and had unconventional CVs. People in her/his field were also interdisciplinary oriented and often moved between fields, which made it hard for the young to get career funding. The fact that people not necessarily needed a doctoral education but sufficient experience, to get Spark funding was also mentioned.

Another interviewee stressed that the application process and format was one of the greatest things about the instrument. This was primarily due to the short application format, which took much less time compared with other grant applications in the SNSF. These length restrictions would further also force researchers to focus on what was most important about the grant, which, in her/his opinion, was the new scientific idea. The larger grants would take a lot of time and with low probability of being successful – a very wasteful process, as explained by this interviewee. Also, in her/his field, a lot of projects could be delivered for smaller amounts of money, and s/he claimed that six Spark grants would deliver more interesting science compared with one SNSF project grant of CHF 600.000. As such, s/he argued that moving towards the Spark system was very defensible, however pointing out that such short format would not be enough for a grant of CHF 4–5 million.

A third interviewee found the open-end of Spark as beneficial, pointing to that not many programmes had open topics. Also, the fact that Spark did not require any 'success', giving researchers the possibility to try something new. The high-risk aspect of Spark was, according to her/him, the real innovation of the instrument: 'I thought wow the first time I read about it. With Spark I don't need a product, I need to write why it is a good idea'. In her/his view, there were no other possibilities for funding a good idea, when you did not know if the idea would work. As such, Spark would give Switzerland a chance of getting new innovations – and the interviewee stressed that you learn both from successful and unsuccessful projects. This was also pinpointed by another interviewee, saying it was completely new to have a funding instrument for unconventional research, where you

could test theories and methods, and after 12 months say that you have no result. In her/his group, they had lot of discussion on what to do if projects failed, and most funding instruments did not allow for projects to fail, s/he explained. Also, s/he added that researchers in her/his group focused a lot on applied research, and that Spark was a perfect match for that.

A fourth interviewee described Spark as enriching the portfolio by being distinctive, small, and open to young applicants. In her/his view, the identity of Spark was very clear and a good addition. S/he her/himself was very much in favour of the scheme, though s/he knew some colleagues in biology and medicine that were less enthusiastic. Others put emphasis on the goal of funding unconventional ideas, and that Spark filled a gap in the funding landscape by that means.

4.2 Spark terms and framework conditions

Applicants' and reviewers' rating of the adequacy of Spark

Most applicants expressed support for the Spark policies and review procedures. When asked to what degree the Spark pilot provided the appropriate policies and review procedures, the respondents indicated that Spark to a large extent was adequate on all issues asked for. Most respondents answered that Spark filled a gap in a Swiss research funding (average 4.4 on a scale from 1 to 5), and supported unconventional and original research (average 4.4 on a scale from 1 to 5). Supporting interdisciplinarity and solid research, and tolerating the funding of research with negative or no results, was somewhat less frequently rated high (averages around 3.6). On all topics there is a significant difference between those who got their application funded and those who did not, where the former group more frequently rated the adequacy of Spark high. Moreover, adequacy for interdisciplinarity and solid research, and for filling a gap in Swiss research funding was more frequently rated high by researchers within the SSH (percentages in table below and regression analysis in Appendix 5, Question 7).

Table 4.5 Spark applicant survey: Views on the appropriateness of Spark policies and review procedures. By outcome of Spark proposal. Percentages and means.

In your opinion, to what degree did the Spark pilot provide the appropriate policies and review procedures to:	1 Not at all	2	3	4	5 To a great extent	Cannot say/not applicable	N	Mean rate (1–5)
A: Support well-founded and solid research?								
Not approved	4	10	26	28	13	19	515	3.46
Approved	2	5	14	33	34	12	302	4.06
Total	3	8	21	30	21	17	817	3.69
B: Support original and ground-breaking research?								
Not approved	5	10	15	30	22	18	515	3.65
Approved	0	1	4	24	65	6	303	4.62
Total	3	7	11	28	38	14	818	4.04
C: Support research ideas with limited basis in previous research (i.e. unconventional research)?								
Not approved	6	10	16	26	24	17	513	3.61
Approved	0	1	3	25	66	4	303	4.63
Total	4	7	11	26	40	12	816	4.03
D: Support high-risk* research?								
Not approved	7	12	15	25	20	20	513	3.50
Approved	0	1	3	26	63	7	301	4.63
Total	4	10	13	18	37	17	815	3.96
E: Tolerate the funding of research with negative or no results?								
Not approved	12	13	15	19	12	29	512	3.09
Approved	1	2	6	25	42	23	301	4.39
Total	8	9	12	21	23	27	813	3.59
F: Facilitate interdisciplinary research?								
Not approved	6	12	22	21	12	27	515	3.29
Approved	2	3	14	26	40	16	303	4.18
Total	4	8	19	23	22	23	818	3.65
G: Support research ideas with a need for rapid funding?								
Not approved	6	11	19	26	17	21	510	3.46
Approved	1	2	9	31	47	11	301	4.36
Total	4	8	15	28	28	17	811	3.82
H: Promote the career of young investigators/researchers?								
Not approved	7	14	15	18	24	21	513	3.50
Approved	1	2	10	17	59	11	302	4.48
Total	4	8	11	25	36	15	814	3.89
I: Fill a gap in the Swiss research funding landscape?								
Not approved	3	5	13	21	46	13	513	4.16
Approved	0	1	4	11	78	6	303	4.78
Total	2	3	10	17	58	10	816	4.40

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

Most reviewers found the Spark pilot adequate for supporting original, ground-breaking and high-risk research. Questions about the adequacy of Spark for different policy aims were also posed in the survey of the reviewers. Like the applicants, the reviewers were mostly positive on these issues. A majority rated Spark high (4 or 5 on the scale from 1 to 5) on supporting original, ground-breaking and high-risk research, as well as on facilitating interdisciplinary research and supporting ideas with limited basis in previous research. The reviewers were a bit more unsure about whether Spark was appropriate for supporting research that needs to be implemented quickly (23% replied they did not know), but among those who had an opinion, a majority rated high (4 or 5) also this item (table below).

Table 4.6 Reviewer Survey: Reviewers' views on adequacy of the Spark procedures. Percentages and means.

In your opinion, to what degree did the Spark pilot provide the appropriate procedures to:	1 Not at all	2	3	4	5 To a great ex- tent	Cannot remem- ber / Cannot say	N	Mean rate (1-5)
a) Support original and ground-breaking research?	1	2	11	41	34	12	673	4.19
b) Support high-risk research?	1	3	17	35	26	17	672	4.00
c) Facilitate interdisciplinary research?	1	4	23	35	19	19	668	3.81
d) Support ideas with limited basis in previous research (i.e. unconventional research)?	1	5	21	36	22	16	670	3.89
e) Support research that needs to be implemented fast?	2	5	22	30	17	23	669	3.72

Source: Spark reviewer survey 2021.

Field variation in Stakeholders' comments on terms and conditions

The stakeholder interviewees explained that there were different views in the different fields on Spark and on the framework conditions for the instrument. For example, one argued that people working in SSH were positive towards Spark, but that researchers in biology and medicine were critical. Some interviewees pointed to that one year was sufficient to start a project, whereas researchers in some fields appreciated a bit longer time horizon:

'In my field [life sciences] one year is a bit short. It should be maybe 1.5-2 years. It is not about the money; it is more about the data and so you should be allowed to ask for extra time to do it properly. But it depends on the science.'

Another interviewee wanted a possibility for longer Sparks projects if the applicant could demonstrate, document, and convincingly argue for the need of it.³⁹

Further, Spark was described as an instrument that could be very successfully applied in fields with a low threshold to implement new ideas – as the infrastructure is already present, as in e.g. chemistry. Thus, there was only need for a good idea and a person to make that idea work. It was argued that there was much opposition to Spark in the life sciences, but in the humanities, engineering, physics, and chemistry were a bit more supportive. The humanities were pointed out as particular in this case, as one argued that humanities represent a completely different way to do research (compared for example to life sciences). For example, in the humanities, s/he argued, they tended to do research on their own, and some projects tended to be short. Therefore, one-year funding such as Spark could be useful for them. However, an interviewee working in the humanities explained that one year was too short, and that the coronavirus made this time limit especially difficult.

³⁹ As noted in Chapter 1.1, Spark projects were normally awarded for 6 to 12 months, while up to 24 months could be awarded for properly justified needs.

An interviewee working within social science found both the project duration and amount of funding reasonable, and s/he pointed out that relative to the US and the UK this amount was very high. In her/his field, this money could be spent to fund a postdoc or to hire a scientific assistant for a year or to buy a dataset (for which there were no other funding opportunities according to her/him).

One of the interviewees was very clear that Spark was not a suitable instrument for people in her/his field, and that the tradition of trying to unify all the SNSF funding was a mistake, in her/his view:

'A problem we have at the SNSF, that the Presiding Board and the admin try to unify that all programs, they should be for all disciplines and evaluation criteria, all should be unified. That is a big mistake, because the requirements in needs, processes and culture in the fields are different and should be taken into account. If you try this one size fits all, it will not fit.'

Moreover, there were some interviewees explaining that Spark money was spent on hiring new postdocs, though this did not go without problems. One interviewee argued that the requirement to start the project 3 months after the grant decision was problematic.⁴⁰ This was because it took time to find a postdoc, and it was especially difficult for junior researchers to recruit good postdocs. In addition, getting the postdoc into the country from outside Schengen was also difficult. This strategy was however problematized by another interviewee, as the new postdoc would need new funding after a year, when Spark funding would run out. In her/his view, the instrument was not useful for taking in a new person.

4.3 Suggestions for a future Spark instrument

Applicants' preferences for a future Spark instrument

Half of the applicants prefer Spark to go on with the same kind of selection procedure as in 2020. 47% of the applicants would prefer a future Spark where the projects are selected based on aggregated individual reviewer scores, giving priority to proposals with a higher score on originality and unconventionality (as Spark 2020). This option was more frequently selected by applicants with approved Spark proposals than by declined applicants (table below). 23% wanted future Spark proposals ranked by a review panel of experts based outside Switzerland (expert panel discussion) while 14% wanted random selection among all proposals assessed fundable by the individual experts. These two latter preferences of future Spark were more frequently mentioned by those with declined proposals.

⁴⁰ The limit was 3 months in the 2019 call; extended to 4 months in the 2020 call. Spark was intended for projects which could be implemented quickly.

Table 4.7 Spark applicant survey: Applicants' preferences for a future Spark instrument. By outcome of Spark proposal. Percentages.

What kind of processes for selecting proposals – after initial review by the individual experts – would you prefer for a future Spark instrument?	Not approved	Approved	Total
Proposals selected based on aggregated individual review scores, giving priority to proposals with a higher score on originality and unconventionality (i.e. as the Spark 2020 call for proposals)	34	70	47
Proposals ranked by a review panel of experts based outside Switzerland (expert panel discussions).	30	12	23
Random selection among all proposals assessed fundable by the individual experts.	18	7	14
Selection based on an algorithm developed to identify original research among all proposal.	6	1	4
Other, please specify:	4	2	3
Do not know	8	8	8
N	515	302	817

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

Applicants were concerned about improved review and selection procedures. In the comment fields in the questionnaire, applicants suggested a mix of the alternatives listed in the questionnaire, e.g. both a panel review/discussions combined with random selection, and some suggested to add rebuttals. One of the applicants in favour of random selection put it like this:

- *It is extremely difficult to accurately predict the impact of a given research project [...] What is most needed is a greater diversity of ideas. A version of Spark that offers a greater number of smaller grants with a randomized selection process may better fulfil this goal and provide the opportunity and motivation for researchers to prove the value and originality of their ideas.*

The blinding of the proposals was also a frequent topic in the comments. Some suggested not blinding the proposals, while others recommend better procedures for ensuring the blinding of proposals. Among the arguments we find both that the blinding was illusionary and that it led to faulty reviews:

- *in Humanities, it is rather an illusion to blind the data. With some minutes of googling, it is really easy to attribute a project. Consequently, I would highly prefer transparent candidatures, with consideration for track records.*
- *It's ludicrous to say a process is anonymous, and then ask for highly specialized, highly interdisciplinary research proposals: the identity of the applicants can be found by Googling who works in what fields in Switzerland. It's a small country, not many people work on the same things.*
- *My proposal was ranked highest (A) and lowest (E?) from the two reviewers and the reason for the E was, that the reviewer did not believe that I could fulfil the first part of the proposal (which is the core competency of my lab and would not have been a problem). Ultimately, the blind evaluation therefore hurt my application rather than supported it.*

Furthermore, there were many comments on the matching of experts to the proposals. Here opinions varied from using experts from other disciplines – to avoid

disciplinary biases – to closer match of experts to each proposal and more reviews per proposal, and also ensuring interdisciplinary experts for interdisciplinary projects. Other comments regarded the aims of the scheme, the review criteria, and the basis for review. Some argued that Spark should target new projects and junior researchers, some that the funded projects were too small for high-risk research, some were concerned that ‘unconventional’ should be defined more clearly and one suggested to add a special section in the proposals to explain its novelty, as illustrated by these examples:

- *Use it to fund smaller units, junior researchers who can gain independence with this funding/boost their careers. Doctoral students and postdocs. Do not shoot this kind of money into units that already have major grants (ERC etc). Use it to foster creativity and out of the box thinking instead of more of the same research.*
- *Allocated amounts [...] do clearly not allow to pursue high risk research that is often time-consuming and expensive to yield significant contribution. Maybe by sketching few clearer fields or research orientations would SNF have more chance to push ‘locally’ for high quality-high risk projects.*
- *Define more clearly ‘unconventional idea’.*
- *Originality and unconventionality seem to be difficult to assess. [...] Indeed, the reviewers attributed an opposite evaluation on these two criteria for my proposal. How come one reviewer thinks it highly unconventional and the other says it shows no unconventional thinking? As such, I am questioning the definition of originality and unconventionality and their employment as criteria for the SPARK call.*
- *Sensitivity to the originality of the proposal, which may be outside the realm of expertise of conventional/conservative evaluators – maybe introduce a special section where the applicants can argue and explain what is new and how it can be missed by existent evaluation criteria.*

Reviewers’ suggestions for a future instrument

As mentioned in Section 3.1.2, the reviewers had divergent views on reviewing anonymous proposals. In the survey’s open field for suggestions for future SNSF funding schemes for unconventional research, some reviewers stated they would like to go on with blinded proposals, others would like to see a CV to be better able to assess the proposal. As a compromise, one suggested a two-stage review in which the last stage was not blinded:

- *Please keep going! Supporting novel and unconventional ideas is important! Moreover, I truly believe a grant proposal should be evaluated based on its content, not a CV of an applicant.*

- *I don't have any specific ideas apart from dropping the double-blindness and including a CV section.*
- *I am not sure that blind review is really conducive to better evaluation. The uncertainties may only add to the unavoidable 'noise' of the review process.*
- *One possibility would be to implement a first round of double blind reviews followed by a unblinded [...] round providing more detailed descriptions.*

Another frequent topic in the suggestions from the reviewers, was clarification of the unconventional criterion, both to the reviewers and in the proposals:

- *Regarding [...] unconventional, it is unclear to me that this criterion is well defined with Spark or in general. A more useful criterion is risk.*
- *I recommend more clarity on defining what is meant by the term 'unconventional', especially to distinguish that criterion from the other criteria of novelty and originality. (This is because, without explicit clarity, the term 'unconventional' might be deemed to include impractical and/or unrealistic methods.)*
- *Unconventional and high-risk are separate concepts, but taken as positive ones are similar (a conventional project is likely to be low risk). The former however is more likely to attract wacky ideas, with no chance of success (or even being understood).*
- *Maybe give practical examples of unconventional research.*
- *A cogent, clear explanation of why the research is considered unconventional should be included up front in the application.*
- *Regarding unconventional research, I think the Spark applications could be encouraged – without writing at too great a length – to offer a more detailed account of the relation of the project to recent research in the field and the field in general.*

Furthermore, some reviewers were concerned that they had been assigned non-novel projects for review and suggested a pre-screening to sort out obviously non-novel projects:

- *There were clearly proposals that were just taken out of larger proposals, others were continuations from existing work or collaborations. It would be helpful to either find a way to administratively sort these out.*

In addition to the comments on criteria and selection process, several reviewers also commented on the scope and target group of the scheme. This included more funding and larger projects to enable unconventional and high-risk research, as well as favouring young applicants and interdisciplinary research.

Stakeholders' preferences

A generally positive attitude towards Spark among stakeholders but concerns about Spark's impact on the allocation of money within the SNSF. The main impression from the stakeholder interviews is a generally positive attitude towards Spark. Many would like to see Spark being continued, though with some adjustments. Some suggested making Spark last for two years, while others pointed out that 12 months was enough, and that also 6 months should be an option because this '...was for testing projects and not a real project'. Others again also would like to see a mini-Spark for PhD students in the future, inspired by doctoral funding in the US (of 30,000 dollars). It would, in one of the interviewees' perspectives, make a major difference and empower PhD students to get such funding, as they depended too much on their supervisors for funding. Another interviewee said there should be no big corrections within the programme, but that the only problem was the anonymization of the proposals. S/he suggested a second round in each call where those who were identified could apply again. Also, s/he saw a need for integrating doctoral students as team members, and further problematized that the money from Spark would cover salary. A researcher that has a full salary has no incentives to apply for Spark, s/he argued, as Spark should not increase the salary.

Still, there were some quite critical opinions concerning the funding of a future Spark. One interviewee stressed that Spark should not be in competition with other instruments in the SNSF portfolio. This was brought up by more interviewees, one claiming that by having Spark financed through the general SNSF funding portfolio would 'punish' some fields that did not find Spark very suitable, and that researchers in these fields would have less money to apply for in the SNSF. In theory Spark is open to all fields, but not perceived so in practice, as pointed out in Section 4.2 on framework conditions. It was argued that Spark had too low a budget and time frame to get results in some fields. As such, one interviewee was pretty clear that Spark should be terminated:

'I find Spark a completely useless, and a superfluous program that should be terminated as quick as possible. The main reason is that Spark takes money from the common budget for the normal grant funding. In my field, projects usually have a duration for 3–6 years, and you always work in teams. Spark, by contrast, gives 1 researcher money for 1 year – you cannot achieve anything in my field with that.'

In her/his view, the fact that there was no additional money following the Spark instrument, led to the PI who would normally get grants now tending to get less money because there was less money in the general pot. The PI would then have to ask all the postdocs in the lab to submit Spark applications to get the money back to the lab. This would, according to the same interviewee, create an additional

application burden in these fields, and multiply the administrative efforts and bureaucracy: 'Spark is creating the problem, that you try to solve by applying for Spark.'

A department head indicated that a future Spark should have a success rate of at least 15–20 % to be attractive, explaining that applicants first look at the success rate, which in the first round of Spark was very high in her/his view. Then, with the low success rate in the second round there were more dissatisfaction among applicants.

4.4 Spark's fit in the Swiss funding landscape – Summary results

Spark filled distinct funding needs. According to the applicants, most of the Spark project ideas were developed before the Spark call and did not fit other funding schemes. At the same time the Spark proposals were often inspired by the applicants' previous work, and in 1/3 of cases directly building on the PI's earlier project. Still, a majority of the applicants had not applied for any other funding for the project. The Spark projects were perceived not to fit with other funding instruments due to their novelty and riskiness, limited preliminary data and/or the eligibility of the applicant.

Funded projects were more often high-risk, novel and in need of new competences. Applicants who got their Spark proposal approved more often saw Spark as an opportunity to address ideas with limited basis in previous research and to test high-risk/high impact ideas. They also more often replied that they had to acquire new competences for the proposed project.

The stakeholders were overall very satisfied with Spark. They described Spark as a funding opportunity for young researchers and for interdisciplinary-oriented research, and a well-suited instrument for researchers with unconventional academic track records. Also, it was completely new to have a funding instrument that allowed for projects to fail. The open-end of Spark, the application process and format was seen as beneficial compared with other funding schemes.

Most reviewers found the Spark pilot adequate for supporting original, ground-breaking and high-risk research. A majority of reviewers rated Spark high on supporting original, ground-breaking and high-risk research, as well as on facilitating interdisciplinary research and supporting ideas with limited basis in previous research.

Most applicants expressed support for the Spark policies and review procedures. Most respondents answered that Spark filled a gap in a Swiss research funding, supported unconventional and original research (average 4.4 on a scale from 1 to 5 on both). Many applicants, and particularly at the Universities of Applied

Sciences, commented that there were no other funding sources where they would have a chance of funding without an academic CV in the field/topic of the proposal and/or get their own salary funded.

Field variation in stakeholders' comments on terms and conditions. The stakeholder interviews point out different views in the different fields on Spark and on the framework conditions for the instrument. Spark could be very successfully applied in fields with a low threshold to implement new ideas, where infrastructure was already present. There was some opposition towards Spark in the life sciences, but researchers in the humanities, engineering, physics, and chemistry were more supportive, it was said. In the survey of the applicants, the social sciences and humanities come out as more positive on Spark's adequacy for facilitating interdisciplinary research, and filling a gap in the Swiss funding landscape.

Half of the applicants prefer Spark to go on with the same kind of selection procedure as in 2020. When given a list of alternative models for selecting future Spark projects, most applicants would not change model, but keep a selection based on aggregated individual reviewer grades, and giving priority to grades on originality and unconventionality. About a quarter would rather have expert panel discussions as basis for the selection, while a minority of 14% wanted random selection among fundable projects. In the free-text fields, some applicants suggested not blinding the proposals, while others recommend better procedures for ensuring the blinding of proposals. Some argued that Spark should target new projects and junior researchers, some that the funded projects were too small for high-risk research, and some were concerned that 'unconventional' should be defined more clearly.

A generally positive attitude towards Spark among stakeholders but concerns about Spark's impact on the allocation of money within the SNSF. Most stakeholders had only minor suggestions for the development of a future Spark, concerning project duration, eligibility criteria and anonymization. Still, some voiced criticism towards having Spark financed through the general SNSF funding portfolio, as it would 'punish' some fields that did not find Spark suitable.

5 Conclusions and recommendations

5.1 Did the Spark pilot reach its goals?

A main aim of Spark was to provide risk-tolerant seed funding for unconventional research that was unlikely to be funded under other funding schemes. Moreover, Spark was set up so that younger and less established researchers could compete with the more experienced. See Section 1.3 on explicit and implied goals of the funding instrument.

5.1.1 Outreach and framework conditions

What type of applicants and projects did Spark attract?

Spark attracted new applicants and projects. The Spark applicant population differed substantially from applicants to other SNSF instruments. Compared with SNSF Project funding, Spark had a much younger applicant population and also a higher proportion of female applicants and of applicants without Swiss citizenship. There were also more proposals from Universities of Applied Sciences. Most notably, a majority of the proposals, as well as of the funded projects, came from applicants who had no previous SNSF grant. The type of projects also differed. They were smaller projects, often in need of seed funding to start new research, including research in a field or topic new to the applicant, but also linked to ongoing research.

Novel projects and risky ideas according to the applicants, while the reviewers were more moderate. According to the applicants, the Spark projects were more often based on novel or risky ideas than their other projects. 82% of them stated that the Spark project was more novel/unconventional and 60% that it was more risky. Among the experts who assessed the proposals, about one third replied that the Spark proposals were more unconventional or more high-risk/high impact than other proposals they had reviewed, while the majority replied that they did not differ substantially or were less unconventional/high-risk. Moreover, almost

half of the reviewers saw little difference from other projects regarding the urgency of getting the projects funded.

Varied portfolio with much within the defined goals for Spark. In sum, we conclude that Spark attracted a broad variety of proposals of which a substantial part was within Spark's targets: novel and unconventional research ideas, high-risk research, small projects that had few other funding options, and funding for younger researchers in temporary positions.

Were the framework conditions of the grants promoting the goals of the instrument?

Unique terms helped attract targeted projects: The broad outreach of Spark was a result of its unique terms: applicant salary was an eligible cost and proposals were reviewed based on anonymous project descriptions. These factors made the scheme very attractive among new applicants, and Spark achieved greater outreach than other SNSF schemes. Moreover, the greater outreach seems to have served the goals of the scheme: with proposals from new groups came new research ideas and many of the proposals from new applicants were awarded. At the same time, the greater outreach resulted in a large number of proposals and so created a larger challenge to review and select the proposals to be funded.

5.1.2 Selection of projects

Were the selection processes promoting the goals of the instrument?

Funding all proposals with top grades – without any panel meetings – gave different effects in the two years. Rather than basing funding decisions on rates and ranking lists negotiated in review panel meetings, approval or non-approval of a Spark proposal was based on the grades from two experts reviewing the proposal individually – without any communication between them. A fixed threshold defined the grades needed for approval.

This way of selecting proposals has both strengths and weaknesses. In a meeting, reviewers can exchange views and come to a joint conclusion. E.g. if one of the reviewers finds the project highly novel and unconventional and the other not, they can learn from each other and settle on how novel and unconventional it is. At the same time, the dynamics in such review discussions may not favour the proposals with divergent grades in advance of the discussions. The reviewers may end up competing to find weaknesses and argue for low grades (Langfeldt 2002:78; Langfeldt et al. 2021:37). Hence, to give new risky research ideas – which may be shot down by senior peers – a chance, a panel meeting may not be productive. A fixed funding threshold and no meeting on the other hand, saves time, but comes

with a higher risk of funding projects based on insufficient assessments, and ending up with an inferior portfolio of funded projects.

Due to different budgets and number of proposals, the threshold for approval of a Spark proposal was much higher in 2020 than in 2019. In 2019, it was sufficient with top grade from one of the reviewers to be funded (overall grades AA, AB, AC or AD were approved). In 2020, one needed overall grades AA or AB, while those with an AB overall rate also needed high scores on the review criteria ‘originality’ and ‘unconventionality’.⁴¹ This gave much less diversity in the funded projects in 2020 in terms of how their originality and unconventionality was assessed. In 2019, a substantial part of the funded proposals had split reviews (AC or AD) on originality and unconventionality, while in 2020 very few proposals with such split reviews were funded. In other words, the way the funding threshold was defined when a lower proportion of proposals could be funded, was not tolerant to diversity in grades. In this respect, the Spark 2020 call was less risk-tolerant than the Spark 2019 call.

When exploring the effects of these different funding lines for the success of different groups of Spark applicants, we see that in 2019, male applicants, and those in a temporary position and in the ETH domain had a significant higher chance of funding, while in a similar analysis for 2020, we find no effect of gender, or type of university. When further exploring the effects of the different funding thresholds in the two years, we get ambiguous results. With a simulated lower success rate in 2019 (using the 2020 threshold) and vice versa a simulated higher success rate in 2020 (using the 2019 threshold), we find different success factors for the two years. With the higher success rate, male applicant, temporary position, ETH domain, and not applying for own salary, appear as significant success factors for the 2019 proposals, while age below 40, having received previous SNSF grants, and doctorate from abroad appear as significant success factors for the 2020 proposals. With the lower success rate on the other hand, age below 40 and holding a temporary position are success factors for the 2020 proposals, and temporary position and not applying for own salary for the 2019 proposals. In other words, the success factors differed between the years, but the different success rates in the two years do not explain differences in success factors. For examples, a higher success rate in 2020 (i.e. the 2019 threshold) would not have given a significant gender bias. Still, we see that with a lower success rate we find fewer identifiable applicant characteristics that effect the success of a proposal. In other words, it appears that different groups of proposals ended up with split reviews (i.e. AC or AD, only funded with the higher threshold) in the two years. In sum,

⁴¹ Proposals with the following grades were approved in 2020: Overall grade AA, or overall grade AB plus at least three As on the review criteria Originality and Unconventionality (and no lower grade than B on these two criteria), or overall grade AB and two As on the review criteria Originality and Unconventionality and no lower grade than B on any of the four review criteria.

differences appear to be linked to differences in the portfolio of proposals and/or their reviews, not the different ways the funding thresholds were defined.

At a more overall level, we still conclude that including originality and unconventionality as key review criteria and funding all proposals with top grades, appear to have served well the aim of supporting original and unconventional research. At the same time, omitting panel meetings was an adequate choice given the limited size of funded projects (i.e. reducing review costs) and probably increased funding chances of proposals with split reviews.

The double-blinded review played an important and positive role, but also created uncertainties. Spark aimed to provide risk-tolerant funding to smaller projects. In this, an important role of the anonymized proposals was to give a strong signal to the reviewers that they should assess the project description on its own merit, and not (try to guess) the competences of the applicants to carrying it out. Moreover, it signalled to the applicants that the most important thing would be to convince the reviewers that the research idea was good and merited to be tested out, and that they were welcome to apply regardless of previous research merits in the topic or field of the proposed research.

In our data, the applicants appear satisfied with and supportive of Spark's double-blinded review procedure, even if many were unsure about how effectively anonymized their proposals were. Also, other stakeholders appear supportive of the double-blinded review.

We do not have data that allow us to conclude firmly whether the anonymous proposals helped identify novel and unconventional research, but there are some indications that it was helpful. Spark opened up for new applicants – the large part had no previous SNSF grant – and junior scholars and scholars in temporary positions most probably had higher success rates in Spark than they would have if they had competed based on proposals containing information on their past performance. Hence, in as far as funding young and novel researchers is an indication of funding novel research, the blinding helped in this respect.

Our analyses do not provide any evidence that anonymous proposals promoted gender equality, nor that it was detrimental for gender equality. Anonymous proposals and blind review appear to have promoted diversity in terms of new applicants and applicants from a broad variety of organizations, but not gender equality. However, Spark attracted a larger proportion of female applicants compared with SNSF Project funding, and the proportion of female Spark applicants increased from 32% in 2019 to 39% in 2020. And while women had significantly lower success rates than men in the first Spark call, the success rates equalled out in the second year when there was a higher proportion of female applicants.

Judging from the survey of the reviewers, the anonymous proposals were helpful for about half of them: close to half thought it was helpful for supporting

unconventional research, while close to one third thought it made little difference, and a minority (8%) thought anonymizing applicants was negative for identifying unconventional research. Those who found it helpful emphasized that it helped assess the research ideas on their own merits and avoid biases.

Still, the data point to a dilemma of identifying unconventional and novel research based on anonymous proposals. With an anonymous project description, you do not get the applicant's links to previous research on the proposed topic and project. Hence, it is easier for the applicant to present ongoing projects as new and unconventional, and harder for the reviewer to know if the project as such is new. Notably, it was not a stated requirement that the Spark projects should be new – the aim was to fund unconventional and original research unlikely to be funded by other instruments. Research may be unconventional and original and not funded by other instruments even if linked to existing projects. Still, the likelihood of this is lower than when without links to existing projects. Moreover, the guidelines to the Spark reviewers said that 'indicators of originality and novelty may be lack of exiting projects, literature or other scientific output on the topic' and they were encouraged to use available databases and search engines to explore this. Hence, in terms of funding research that was not linked to applicants' previous projects the blinding of the proposals complicated the reviewers' work. The survey data indicate that building on own previous research to some extent reduced chances of funding, still many projects building on own previous research were funded: 21% of the rejected applicants and 16% of funded applicants reported that the proposed project to a great extent built directly on previous projects where they themselves were the principal investigator.

Were the review and selection processes efficiently managed?

Administrative costs for the review and selection process were relatively low. The funding of small projects, as in the Spark instrument, may easily give higher administrative costs for the review and selection process compared with the size of the grant budget. In the SNSF administration, Spark was perceived as more demanding than other SNSF schemes due to a great number of proposals and lack of adequate ICT tools for handling the proposals. When measured as estimated FTEs in the SNSF Administrative Office per mill CHF granted, Spark demanded more administrative resources compared with SNSF Project funding, but less than Post-doc.Mobility. When instead measured as estimated administrative FTEs per call, Spark demanded fewer administrative resources than these two other funding schemes. Hence, it seems that the SNSF succeeded in keeping the administrative costs of Spark's review and selection process relatively low. Moreover, compared with other funding schemes, Spark was less time-demanding for the applicants.

Algorithm matched experts worked sufficiently well. An algorithm for matching experts to proposals was developed for the second Spark call. The algorithm was used to find matches for the individual proposals within a predefined reviewer pool. The final selection of reviewers, and when needed additional searches outside the predefined reviewer pool, was done manually. In some fields of research, the algorithm proved insufficient and much of the work had to be done manually. Overall, expert selections informed by the algorithm seems to have resulted in less close matches between experts and proposals, when compared with selection not informed by the algorithm. Still, this difference is small, and when controlling for other factors, the use of the algorithm does not seem to have affected the success rate of the proposals. In sum, the algorithm for matching experts which was developed for the Spark pilot, appears to have worked sufficiently well. The algorithm tool was new and used for the first time in the second Spark call, and it is hard to judge the time of manual work it may have saved. Still, the kind of algorithm tool developed, is likely have good potential for saving time when – as for Spark – many proposals for small grants in all different kinds of fields are to be assessed within a short period.

5.1.3 Niche and role in Swiss research funding

How did Spark integrate into the research and funding landscape?

Spark appeared with a distinct niche in the Swiss research funding landscape. The data indicate that Spark filled a gap in Swiss research funding. The applicants often perceived their Spark proposal not fit for other funding instruments due to novelty, limited preliminary data, riskiness, and/or eligibility. A majority of them had not applied for any other funding for their Spark project, and 66% had no previous SNSF grant.

Spark opened up for a broad set of aims and applicants, and filled different needs for different groups of applicants. By allowing funding of applicant's salary and assessing proposals based on the project description only, not the applicant's past research merits – e.g. introducing anonymized proposals and double-blinded reviews – the SNSF opened up for new groups of applicants. Most importantly young scholars in temporary positions, but also researchers at institutions where permanent staff do not have dedicated time for research – such as many Universities of Applied Sciences. In this way, Spark reached a broad target group, and was attractive for scholars doing basic as well as applied and interdisciplinary research.

Much support for Spark, but field differences. Most applicants, and especially the funded ones, rated Spark positive on filling a gap in Swiss research funding, supporting unconventional and original research, supporting ideas with a need for

rapid funding, and supporting high-risk research. Moreover, most reviewers found the Spark pilot adequate for supporting original, ground-breaking and high-risk research. Stakeholders still pointed to field differences in the adequacy of the funding instrument. Spark was found to be more adequate in fields with a low threshold to test out new research ideas – and where this could be done within a short time horizon.

In conclusion, we find that Spark integrated well in the Swiss research funding landscape. It filled a variety of unmet needs for a broad group of applicants. Moreover, judging from survey replies from funded and non-funded applicants, it appears that funded projects more often (than non-funded) concurred with Spark's aim of addressing unconventional ideas/ideas with limited basis in previous research and to test high-risk/high impact ideas.

5.2 How should a future Spark instrument be?

Overall, the Spark pilot worked according to intentions. As summarized above, major goals were achieved and the new funding instrument with unique terms and novel selection procedure appears much appreciated among the stakeholders. Still, some challenges are pointed out in this evaluation:

- a) *Broad outreach and low success rates:* A large number of proposals were submitted to Spark, resulting in low success rates and making it more challenging to provide risk-tolerant funding in the second call.
- b) *Unclear review criteria:* Reviewers point to 'unconventionality' and 'originality' as criteria which are hard to separate.
- c) *Difficulties in assessing the unconventionality of research:* Reviewers point out 'unconventionality' as hard to assess, especially when the proposal is not in their field of expertise.
- d) *Managements costs for small projects:* Even if relatively low, resources spent in the SNSF Administrative Office are higher for Spark than for SNSF Project funding – when measured as estimated FTEs per mill CHF granted – and should be possible to reduce.

Based on our evaluation, NIFU recommends a continuation of Spark as a funding instrument dedicated to unconventional research, while adjusting it to handle the challenges listed above. Suggestions and concerns for addressing the challenges are provided in the below paragraphs.

Goals, target groups and target projects, eligibility (addressing challenge a)

The Spark pilot had multiple goals as outlined in Section 1.3. A main aim was risk-tolerant seed funding for unconventional research. With its terms and conditions, Spark also served to fill a gap in funding for young researchers and less research-intensive organizations/Universities of Applied Sciences, and for some it served as a career instrument. The downside of the popularity of the instrument was a low success rate in the last call, which implied less risk-tolerant funding. Hence, harder priorities of the goals Spark is to serve may be needed to reduce the number of proposals. The dilemma is that if restricting the target group (e.g. not funding applicant salary), a large part of the group that found the Spark pilot attractive and developed successful proposals, would be excluded from applying. Still, it can be argued that the target groups and goals of funding schemes should be clear and delimited to fit overall policies. It was not an explicit goal of Spark to enable young scholars, and researchers at Universities of Applied Sciences and other less research-intensive institutions, without a (strong) academic CV in the field of the proposal to pursue new research ideas. Yet, many perceived this an important goal and success of Spark, and they saw it as a career instrument and/or an opportunity to move to fields/topics in which they lacked a CV. Hence, for a future instrument goals ought to be clearer, and the eligibility criteria should be considered both in terms of aligning with overall SNSF policy/policies for researcher careers and career mobility, and the number of proposals wanted.

In the choice between keeping Spark a popular instrument with broad outreach/ability to attract a wide set of unconventional projects in need of seed funding, and keeping the success rate high to provide risk-tolerant funding, one solution may be to find other ways to facilitate risk-tolerant funding. See 'Review and selection process' below on random selection.

- *Recommendation:* Clarify goals and consider harder priorities of the goals and more delimited types of target projects, to reduce the number of proposals and keep success rates high. Consider whether the eligibility criteria fit the SNSF's overall policy and policies for researcher careers.

Review criteria (addressing challenge b)

'Unconventionality' and 'originality' are interlinked criteria and reviewers found them hard to separate and would like clearer guidelines. In developing review criteria and guidelines for a future Spark instrument, the SNSF should consider clearer guidelines on these criteria and/or merging them to one criterion. Arguments for keeping the two criteria separate are: it gives increased review focus on the unconventionality and originality aspects of the proposals, that separating the

two was manageable for the reviewers in the Spark pilot, and that they sometimes rated them differently. Arguments for merging them are to ease the reviewer job, that many reviewers did not find it meaningful to separate them, and that when the distinction is not clear to the reviewers, it is also hard to distinguish between/interpret the reviewers' scores on the two criteria. As a basis for revised guidelines a study of how the criteria were used in different fields (i.e. study and compare a sample of assessments/comments on the two criteria provided by the reviewers in the review forms) should be useful. One specific issue to clarify is whether or not a proposal's links to previous projects should count negatively, and in particular whether links to the applicant's ongoing or previous projects are to be assessed as negative.

If links to an applicant's other projects is to count negatively, a non-blinded pre-screening of proposals with links to the applicant's other projects may be useful. If a pre-screening is found to be hard or demanding too many resources, an alternative or additional measure is to ask the applicants to explain, in a separate section of the proposal, how the proposed research differs from and links to their previous research (either anonymized for the reviewers or openly for a pre-screening). In all cases, the eligibility criteria and criteria for reviewing the proposals' originality and unconventionality needs to be made clear both to the reviewers and to the applicants.

- *Recommendation:* Consider clearer guidelines on the review criteria 'unconventionality' and 'originality', and possibly merge them into one criterion. Clarify whether a proposal's links to applicants' ongoing or previous projects should count negatively. If links to an applicant's other projects are to count negatively, make this clear to applicants and consider a *non-blinded pre-screening* of proposals to exclude those with links to applicant's other projects.

Expert pool and match to proposals (addressing challenge c)

It is hard to assess how original or unconventional a research idea is if you do not have full overview of the field, i.e. if it is outside your specific field of expertise. Each Spark proposal was assessed by two experts, still the combination of expertise varied between the proposals. In the 2020 call, 31% of the proposals were assessed by two close experts (i.e. experts who indicated that the assigned proposal was within their area of specialization), while about half of the proposals were assessed by one 'within specialization expert' and one 'within the wider discipline expert' and 18% were assess by two 'within the wider discipline' experts (there is no data on this for the 2019 call). In future calls, the SNSF should try to ensure two 'within-specialization experts' for each proposal. This should give

more thorough assessments of originality or unconventionality and may also give more *equal chances* for a positive assessment (as close experts more often appear to give low grades).

- *Recommendation:* Enable more thorough assessments of unconventionality by ensuring to recruit two ‘within-specialization experts’ for each proposal, and so also give all proposals a more equally ‘tough’ assessment.

Review and selection processes (addressing challenges a and c)

Half of the applicants prefer Spark to go on with the same kind of selection procedure as in 2020, that is, to base selection on aggregated individual review scores, while giving priority to proposals with a higher score on originality and unconventionality. No other alternative gets higher support than this alternative, which means much support to the SNSF to go on along the same lines for a future Spark instrument.

As noted above, low success rates easily reduce the risk-tolerance of a funding instrument. If the SNSF does not want, or is unable, to take measures to ensure higher success rates in a future Spark instrument (by either increasing budgets or restricting eligibility), an alternative for achieving more risk-tolerant funding is to add an element of random selection. For example, when not possible to fund all proposals in a category based on the overall grades (e.g. not funding for all graded AB), a random selection among all with at least one top overall grade and one top grade on unconventionality/originality, could ensure that also proposals with divergent reviews have a chance of funding.

- *Recommendation:* Continue to base selection on aggregated individual review scores, and in particular scores on originality/unconventionality. Ensure risk-tolerant seed funding for unconventional research either by keeping success rates high or by introducing an element of random selection.

Reduce management costs (addressing challenge d)

The SNSF has succeeded in keeping the administrative costs of Spark’s review and selection process relatively low. There is still potential for reducing administrative costs and ensuring that costs are proportional to the small size of the grants. The ICT tools at the SNSF were not adequate for handling the Spark pilot, and much work had to be done manually. Moreover, the algorithm for matching experts to proposals did not save as much time as could be hoped, and a long timeline was needed for expert search. With more adequate tools there should be a potential to reduce administrative costs in a future Spark instrument. Moreover, it may be

possible to reduce the administrative costs for the management of funded Spark projects. Currently funded projects are followed up by the SNSF in much the same way as the larger and longer SNSF Project funding. The SNSF should consider easing the routines for follow-up of the Spark projects.

- *Recommendation:* Ensure that the costs of administering the funding instrument are proportionate to the small size of the grants. More adequate ICT tools should be a help in this.

References

- Bhattacharjee, Y. (2012). NSF's 'Big Pitch' Tests Anonymized Grant Reviews. *Science* 336, (6084):969-970.
<https://www.science.org/doi/10.1126/science.336.6084.969>
- Bourke, P., & Butler, L. (1999). The efficacy of different modes of funding research: perspectives from Australian data on the biological sciences. *Research Policy*, 28(5), 489–499.
- Budden, AE, Tregenza T, Aarssen LW, et al. (2008): Double-blind review favours increased representation of female authors. *Trends Ecol Evol*. 23(1): 4–6.
- ESF (2011). European Peer Review Guide. Integrating Policies and Practices into Coherent Procedures. Strasbourg: European Science Foundation (www.esf.org)
- Heinze, T & Bauer, G. (2007): Characterizing creative scientists in nano S&T: productivity, multidisciplinary, and network brokerage in longitudinal perspective. *Scientometrics* 70: 811–830.
- Heinze, T. (2008): How to sponsor ground-breaking research: a comparison of funding schemes. *Science and Public Policy* 35: 302–318.
- Heyard R.; A. Jorstad (2021). Learnings from Spark. Descriptives, Statistical Models and Gender Effects. SNSF.
- Langfeldt, L. (2001). The decision-making constraints and processes of grant peer review, and their effects on review outcome. *Social Studies of Science* 31: 820–41.
- Langfeldt, L. (2006). The policy challenges of peer review: managing bias, conflict of interest and interdisciplinary assessments. *Research Evaluation* 15, 31–41.
- Langfeldt, L., Ramberg, I., Gunnes, H. (2014). Swiss Research Funding. Researcher Survey for the Swiss National Science Foundation (SNSF). NIFU report 5/2014.
- Langfeldt, Liv and Siri Brorstad Borlaug (2016). *Swiss National Centres of Competence in Research. Evaluation of the selection process*. Oslo: NIFU Report 2016:42.
- Langfeldt, Liv, Siri Brorstad Borlaug and Inge Ramberg (2021). *Swiss National Centres of Competence in Research. Evaluation of the Selection Process of the 5th Series*. Oslo: NIFU Report 2021:5.

- Laudel G., Gläser, J. (2014). Beyond breakthrough research: Epistemic properties of research and their consequences for research funding. *Research Policy* 43: 1204–1216
- Liaw, L., Freedman, J. E., Becker, L. B., Mehta, N. N., & Liscum, L. (2017). Peer review practices for evaluating biomedical research grants: A scientific statement from the American Heart Association. *Circulation research*, 121(4), e9–e19.
- Severin A, Martins J, Heyard R, Delavy F, Jorstad A, Egger M (2020). Gender and other potential biases in peer review: cross-sectional analysis of 38 250 external peer review reports. *BMJ Open* 10:e035058. doi: 10.1136/bmjopen-2019-035058.
- Witteman, H. O., Hendricks, M., Straus, S., & Tannenbaum, C. (2019). Are gender gaps due to evaluations of the applicant or the science? A natural experiment at a national funding agency. *The Lancet*, 393(10171), 531–540.
- Wu, L., Wang, D. & Evans, J.A. (2019). Large teams develop and small teams disrupt science and technology. *Nature* 566, 378–382.
<https://doi.org/10.1038/s41586-019-0941-9>
- Öquist, G., and Benner, M. (2012). Fostering breakthrough research: A comparative study. *Kungl. Vetenskapsakademien*.

Appendix 1 Tables

Table A 1 Spark applicants by proposal field

Year	Applicant type	Biology and Medicine	Mathematics, Natural- and Engineering Sciences	Social Sciences and Humanities	N
2019	Main applicant	39.7 %	31.3 %	29.0 %	720
	Co-applicant	48.4 %	22.6 %	28.9 %	190
	Total	41.5 %	29.5 %	29.0 %	910
2020	Main applicant	41.6 %	28.9 %	29.5 %	868
Total	Main applicant	40.7 %	30.0 %	29.3 %	1588
	Total	41.6 %	29.2 %	29.2 %	1778

Table A 2 Spark applicants: Type of applicant by proposals outcome

Year	Applicant type	Not funded	Funded	Total
2019	Main applicant	61.8 %	38.2 %	720
	Co-applicant	63.2 %	36.8 %	190
	Total	62.1 %	37.9 %	910
2020	Main applicant	88.4 %	11.6 %	868
Total	Main applicant	76.3 %	23.7 %	1588
	Total	74.9 %	25.1 %	1778

Table A 3 Spark applicants by gender

Year	Applicant type	Female	Male	Total
2019	Main applicant	31.9 %	68.1 %	720
	Co-applicant	30.5 %	69.5 %	190
	Total	31.6 %	68.4 %	910
2020	Main applicant	38.6 %	61.4 %	868
Total	Main applicant	35.6 %	64.4 %	1588
	Total	35.0 %	65.0 %	1778

Table A 4 Spark applicants by age

Year	Applicant type	Below 30	30-39	40-49	50-59	60+	Total
2019	Main applicant	3.9 %	54.4 %	28.6 %	11.1 %	1.9 %	720
	Co-applicant	4.2 %	35.4 %	34.4 %	20.1 %	5.8 %	189
	Total	4.0 %	50.5 %	29.8 %	13.0 %	2.8 %	909
2020	Main applicant	3.2 %	54.6 %	30.3 %	9.0 %	2.9 %	866
Total	Main applicant	3.5 %	54.5 %	29.5 %	10.0 %	2.5 %	1586
	Total	3.6 %	52.5 %	30.0 %	11.0 %	2.8 %	1775

Table A 5 Spark applicants by temporary/permanent position

Year	Applicant type	Fixed-term contract	No contract	Permanent contract	Total
2019	Main applicant	57.0 %	7.4 %	35.6 %	719
	Co-applicant	29.0 %	2.3 %	68.8 %	176
	Total	51.5 %	6.4 %	42.1 %	895
2020	Main applicant	58.9 %	7.0 %	34.1 %	868
Total	Main applicant	58.0 %	7.2 %	34.8 %	1587
	Total	55.1 %	6.7 %	38.2 %	1763

Table A 6 Spark applicants by own salary included in the Spark proposal

Year	Applicant type	Not appl. own salary	Applied own salary	Total
2019	Main applicant	41.3 %	58.8 %	720
	Co-applicant	53.2 %	46.8 %	190
	Total	43.7 %	56.3 %	910
2020	Main applicant	40.4 %	59.6 %	868
Total	Main applicant	40.8 %	59.2 %	1588
	Total	42.1 %	57.9 %	1778

Table A 7 Spark applicants by position/function in the project

Year	Applicant type	Head of institute, department etc.	Group leader, Senior physician	Researcher or other pos.	Junior researcher	Total
2019	Main applicant	7.2 %	22.0 %	26.3 %	44.5 %	719
	Co-applicant	21.6 %	34.1 %	22.2 %	22.2 %	176
	Total	10.1 %	24.4 %	25.5 %	40.1 %	895
2020	Main applicant	4.8 %	19.7 %	27.1 %	48.4 %	868
Total	Main applicant	5.9 %	20.7 %	26.7 %	46.6 %	1587
	Total	7.5 %	22.1 %	26.3 %	44.2 %	1763

Table A 8 Spark applicants by professorship

Year	Applicant type	Professor	Not Professor	Total
2019	Main applicant	25.3 %	74.7 %	719
	Co-applicant	43.2 %	56.8 %	176
	Total	28.8 %	71.2 %	895
2020	Main applicant	21.4 %	78.6 %	868
Total	Main applicant	23.2 %	76.8 %	1587
	Total	25.2 %	74.8 %	1763

Table A 9 Spark applicants by Country of doctorate degree

Year	Applicant type	Switzerland	Other	Total
2019	Main applicant	44.7 %	55.3 %	657
	Co-applicant	48.6 %	51.4 %	138
	Total	45.4 %	54.6 %	795
2020	Main applicant	40.1 %	59.9 %	820
Total	Main applicant	42.2 %	57.8 %	1477
	Total	42.7 %	57.3 %	1615

Table A 10 Spark applicants by Nationality

Year	Applicant type	Switzerland	Other	Total
2019	Main applicant	35.3 %	64.7 %	719
	Co-applicant	45.3 %	54.7 %	190
	Total	37.4 %	62.6 %	909
2020	Main applicant	31.8 %	68.2 %	868
Total	Main applicant	33.4 %	66.6 %	1587
	Total	34.7 %	65.3 %	1777

Table A 11 Spark 2019. Binominal logistic regression with dependent variable 'Proposal approved'.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Not applied for own salary	,448*	,211	4,497	1	,034	1,565	1,035	2,367
Professor	,242	,235	1,067	1	,302	1,274	,805	2,019
Permanent position	-,551*	,227	5,892	1	,015	,577	,370	,899
Age 40+ in appl. Year	-,254	,209	1,482	1	,223	,775	,515	1,168
Received grants prev.	,367	,210	3,068	1	,080	1,444	,957	2,178
Female	-,436*	,193	5,096	1	,024	,647	,443	,944
Doctorate not in Switzerland	,316	,183	2,973	1	,085	1,371	,958	1,964
Biology and Medicine			3,912	2	,141			
Mathematics, Natural- and Engineering sciences	-,386	,224	2,972	1	,085	,680	,439	1,054
Social sciences and humanities	,050	,220	,052	1	,820	1,051	,684	1,616
Cantonal university			8,117	2	,017			
ETH Domain	,604*	,217	7,729	1	,005	1,829	1,195	2,800
University of Applied Sciences	,370	,301	1,513	1	,219	1,448	,803	2,612
Constant	-,777	,426	3,323	1	,068	,460		

*p<0.05.

Table A 12 Spark 2019 with simulated 2020 success rates¹. Binominal logistic regression with dependent variable 'Grades approved as in 2020'.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Not applied for own salary	,722*	,300	5,808	1	,016	2,059	1,144	3,705
Professor	-,186	,340	,299	1	,585	,830	,426	1,617
Permanent position	-,920*	,351	6,884	1	,009	,398	,200	,792
Age 40+ in appl. Year	,009	,305	,001	1	,977	1,009	,555	1,833
Received grants prev.	,491	,307	2,562	1	,109	1,634	,896	2,982
Female	-,244	,287	,719	1	,396	,784	,446	1,376
Doctorate not in Switzerland	,290	,270	1,150	1	,284	1,336	,787	2,269
Biology and Medicine			,718	2	,699			
Mathematics, Natural and Engineering sciences	,233	,310	,563	1	,453	1,262	,687	2,319
Social sciences and humanities	-,022	,338	,004	1	,949	,979	,505	1,897
Cantonal university			3,032	2	,220			
ETH Domain	,509	,293	3,011	1	,083	1,664	,936	2,956
University of Applied Sciences	,267	,492	,294	1	,588	1,306	,498	3,427
Constant	-2,828	,655	18,661	1	,000	,059		

*p<0.05.

¹ Proposals with the following grades included as approved: Overall grade AA, or overall grade AB plus at least three As on the review criteria Originality and Unconventionality (and no lower grade than B on these two criteria), or overall grade AB and two As on the review criteria Originality and Unconventionality and no lower grade than B on any of the four review criteria.

Table A 13 Spark 2020. Binominal logistic regression with dependent variable 'Proposal approved'.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Not applied for own salary	,082	,272	,090	1	,764	1,085	,636	1,850
Professor	,273	,346	,622	1	,430	1,314	,667	2,589
Permanent position	-,715*	,363	3,876	1	,049	,489	,240	,997
Age 40+ in appl. Year	-,782*	,314	6,186	1	,013	,458	,247	,847
Received grants prev.	,219	,318	,474	1	,491	1,244	,668	2,319
Female	-,085	,248	,118	1	,731	,918	,565	1,493
Algorithm used for assigning experts	,495	,256	3,737	1	,053	1,640	,993	2,708
Both reviewers are within field of expertise	-,470	,269	3,063	1	,080	,625	,369	1,058
Doctorate not in Switzerland	,151	,256	,348	1	,555	1,163	,704	1,923
Biology and Medicine			,666	2	,717			
Mathematics, Natural and Engineering sciences	,145	,299	,236	1	,627	1,156	,644	2,077
Social sciences and humanities	-,133	,320	,173	1	,677	,875	,467	1,639
Cantonal university			,091	2	,956			
ETH Domain	-,066	,289	,053	1	,818	,936	,531	1,650
University of Applied Sciences	,057	,421	,018	1	,893	1,058	,463	2,416
Constant	-1,321	,661	3,993	1	,046	,267		

*p<0.05.

Table A 14 Spark 2020 with simulated 2019 success rates¹. Binominal logistic regression with dependent variable 'Grades approved as in 2019'.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Not applied for own salary	,176	,186	,888	1	,346	1,192	,827	1,717
Professor	-,177	,228	,605	1	,437	,838	,536	1,309
Permanent position	-,195	,215	,828	1	,363	,823	,540	1,253
Age 40+ in appl. Year	-,489*	,195	6,295	1	,012	,613	,418	,898
Received grants prev.	,568*	,208	7,419	1	,006	1,764	1,173	2,654
Female	-,272	,165	2,719	1	,099	,761	,551	1,053
Algorithm used for assigning experts	,107	,164	,428	1	,513	1,113	,808	1,534
Both reviewers are within field of expertise	-,312	,171	3,338	1	,068	,732	,524	1,023
Doctorate not in Switzerland	,392*	,171	5,233	1	,022	1,480	1,058	2,071
Biology and Medicine			1,947	2	,378			
Mathematics, Natural- and Engineering sciences	-,128	,208	,375	1	,540	,880	,585	1,324
Social sciences and humanities	-,291	,209	1,942	1	,163	,748	,497	1,125
Cantonal university			1,751	2	,417			
ETH Domain	,121	,203	,355	1	,552	1,129	,758	1,680
University of Applied Sciences	,342	,265	1,661	1	,197	1,407	,837	2,365
Constant	-,350	,435	,650	1	,420	,704		

*p<0.05.

¹ Proposals with overall grades AA, AB, AC or AD included as approved.

Table A 15 Spark success rates by the main applicant's previous SNSF grants, percentages 2019 and 2020.

Year	Spark Call	N previous SNSF Grants to the main applicant	N Spark Proposals	Funded Spark projects	Spark success rate
2019		0	450	158	35.1
		1	119	54	45.4
		More than 1	151	63	41.7
		Total	720	275	38.2
2020		0	592	72	12.2
		1	101	10	9.9
		More than 1	175	19	10.9
		Total	868	101	11.6
Total		0	1042	230	22.1
		1	220	64	29.1
		More than 1	326	82	25.2
		Total	1588	376	23.7

Source: Data provided by the SNSF.

Table A 16 Applications by applicant gender, Spark vs SNSF project Funding and Postdoc.Mobility 2019 and 2020.

Year	Gender	Project funding		Postdoc.Mobility		Spark	
		N pro-proposals	% proposals by gender	N pro-proposals	% proposals by gender	N pro-proposals	% proposals by gender
2019	Female	489	26.9	377	39.0	230	31.9 %
	Male	1327	73.1	589	61.0	490	68.1 %
	Total	1816	100.0	966	100.0	720	100.0 %
2020	Female	489	25.7	422	41.6	335	38.6 %
	Male	1417	74.3	592	58.4	533	61.4 %
	Total	1906	100.0	1014	100.0	868	100.0 %
Total	Female	978	26.3	799	40.4	565	35.6 %
	Male	2744	73.7	1181	59.6	1023	64.4 %
	Total	3722	100.0	1980	100.0	1588	100.0 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding and Postdoc.Mobility by the SNSF Data Team.

Table A 17 Applications by age, Spark vs SNSF project Funding and Postdoc.Mobility 2019 and 2020.

Year	Age	Project funding		Postdoc.Mobility		Spark	
		N proposals	% proposals by age	N proposals	% proposals by age	N proposals	% proposals by age
2019	below 30	3	0.2	274	28.36	28	3.9 %
	30-39	323	17.8	661	68.43	392	54.4 %
	40-49	745	41.0	28	2.90	206	28.6 %
	50-59	611	33.6	3	0.31	80	11.1 %
	60+	134	7.4	0	0.00	14	1.9 %
	Total	1816	100.0	966	100.00	720	100.0 %
2020	below 30	1	0.1	321	31.66	28	3.2 %
	30-39	349	18.3	668	65.88	473	54.6 %
	40-49	793	41.6	25	2.47	262	30.3 %
	50-59	620	32.5	0	0.00	78	9.0 %
	60+	143	7.5	0	0.00	25	2.9 %
	Total	1906	100.0	1014	100.00	866	100.0 %
Total	below 30	4	0.1	595	30.05	56	3.5 %
	30-39	672	18.1	1329	67.12	865	54.5 %
	40-49	1538	41.3	53	2.68	468	29.5 %
	50-59	1231	33.1	3	0.15	158	10.0 %
	60+	277	7.4	0	0.00	39	2.5 %
	Total	3722	100.0	1980	100.00	1586	100.0 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding and Postdoc.Mobility by the SNSF Data Team.

Table A 18 Applications by applicant nationality, Spark vs SNSF project Funding and Postdoc.Mobility 2019 and 2020.

Year	Nationality	Project funding		Postdoc.Mobility		Spark	
		N proposals	% proposals by nationality	N proposals	% proposals by nationality	N proposals	% proposals by nationality
2019	Switzerland	915	50.4	380	39.3	254	35.3 %
	Other	901	49.6	586	60.7	465	64.7 %
	Total	1816	100.0	966	100.0	719	100.0 %
2020	Switzerland	926	48.6	378	37.3	276	31.8 %
	Other	980	51.4	636	62.7	592	68.2 %
	Total	1906	100.0	1014	100.0	868	100.0 %
Total	Switzerland	1841	49.5	758	38.3	530	33.4 %
	Other	1881	50.5	1222	61.7	1057	66.6 %
	Total	3722	100.0	1980	100.0	1587	100.0 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding and Postdoc.Mobility by the SNSF Data Team.

Table A 19 Applications by applicant's doctorate country, Spark vs SNSF project Funding 2019 and 2020.

Year	Doctorate country	Project funding		Spark	
		N proposals	% proposals by dr. country	N proposals	% proposals by dr. country
2019	Switzerland	713	43.8	294	44.7 %
	Other	916	56.2	363	55.3 %
	Total	1629	100.0	657	100.0 %
2020	Switzerland	701	40.9	329	40.1 %
	Other	1015	59.1	491	59.9 %
	Total	1716	100.0	820	100.0 %
Total	Switzerland	1414	42.3	623	42.2 %
	Other	1931	57.7	854	57.8 %
	Total	3345	100.0	1477	100.0 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding by the SNSF Data Team.

Table A 20 Applications by function in project/position, Spark vs SNSF project Funding 2019 and 2020.

Year	Function in project/position	Project funding		Spark	
		N proposals	% proposals by	N proposals	% proposals by
2019	Group leader, Senior physician	761	42.0	158	22.0 %
	Head of ins., dept etc	568	31.3	52	7.2 %
	Researcher, other	458	25.3	189	26.3 %
	Junior researcher	26	1.4	320	44.5 %
	Total	1813	100.0	719	100.0 %
2020	Group leader, Senior physician	833	43.8	171	19.7 %
	Head of ins., dept etc	570	29.9	42	4.8 %
	Researcher, other	463	24.3	235	27.1 %
	Junior researcher	38	2.0	420	48.4 %
	Total	1904	100.0	868	100.0 %
Total	Group leader, Senior physician	761	42.0	329	20.7 %
	Head of ins., dept etc	568	31.3	94	5.9 %
	Researcher, other	458	25.3	424	26.7 %
	Junior researcher	26	1.4	740	46.6 %
	Total	1813	100.0	1587	100.0 %

Source: Spark Data provided by the SNSF and aggregated data on Project funding by the SNSF Data Team.

Table A 21 Overall grade by number of reviews the reviewer performed, by year. Spark reviews*, percentages.

Year	Overall Grade	Reviewed Spark proposals that year		Total
		1	>1	
2019	A	23.2 %	25.1 %	24.4 %
	B	29.3 %	27.8 %	28.4 %
	C	28.5 %	33.7 %	31.7 %
	D	19.1 %	13.4 %	15.6 %
	N	509	841	1350
2020	A	23.4 %	22.8 %	23.0 %
	B	31.0 %	32.8 %	32.1 %
	C	31.5 %	31.7 %	31.6 %
	D	14.1 %	12.6 %	13.2 %
	N	610	1030	1640

Source: Data provided by the SNSF. *The sample consists of the Spark reviews in 2020, two per reviewed proposal (i.e. the unit of analysis are the reviews (not the proposals or the reviewers).

Table A 22 Grade on unconventionality by number of reviews the reviewer performed, by year. Spark reviews*, percentages.

Year	Grade on unconventionality	Reviewed Spark proposals that year		Total
		1	>1	
2019	A	23.8 %	19.0 %	20.8 %
	B	33.0 %	32.5 %	32.7 %
	C	32.4 %	38.9 %	36.4 %
	D	10.8 %	9.6 %	10.1 %
	N	509	841	1350
2020	A	21.0 %	19.2 %	19.9 %
	B	35.2 %	37.3 %	36.5 %
	C	32.1 %	33.4 %	32.9 %
	D	11.6 %	10.1 %	10.7 %
	N	610	1030	1640

Source: Data provided by the SNSF. *The sample consists of the Spark reviews in 2020, two per reviewed proposal (i.e. the unit of analysis are the reviews (not the proposals or the reviewers).

Table A 23 Spark applicant survey: Motivations to apply for Spark by type of institution, means on a scale from 1 'Not at all' to 5 'To a great extent'.

Q1 Why did you apply for a Spark grant? Please indicate your motivations on the scale from 1 to 5.	Cantonal university				Total
	ETH Domain	UAS*	Other		
a) I needed funding for a project idea which was developed before I learnt about Spark	3.54	3.70	3.24	3.31	3.52
b) I developed a new project idea that was motivated by the Spark call.	3.03	2.65	3.01	3.21	2.95
c) It was an opportunity to address ideas with limited basis in previous research	4.27	4.25	4.15	4.43	4.25
d) It was an opportunity to test high-risk/high impact research ideas.	4.22	4.34	4.02	3.98	4.20
e) It was an opportunity to address interdisciplinary research ideas.	3.50	3.55	3.59	3.29	3.51
f) The project did not fit to other funding instruments of the SNSF.	3.59	3.74	3.77	3.49	3.65
g) I was motivated by the possibility of being assessed exclusively on the proj. descrip.	3.84	3.68	3.93	3.90	3.82
h) I saw the proposal/project as a step in building an academic career.	3.82	3.88	3.23	3.61	3.73
i) My colleagues/head of lab/department encouraged me to apply for a Spark grant	2.95	3.06	2.89	3.04	2.97
j) I had a project that needed to be implemented fast.	3.25	3.23	2.60	3.12	3.13

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls). See Table 2.17 for overall figures.

*University of applied sciences.

Table A 24 Transparency, impartiality and confidence in Spark compared with applicants' other SNSF funding schemes. Replies from Spark applicants, by approval of Spark proposal. Percentages.

Comparing the Spark pilot to other SNSF funding schemes* you are familiar with, was Spark poorer, about the same or better, concerning	About the same			Cannot say/not applicable	N
	Better	Poorer			
<i>B: The transparency of the selection process</i>					
Not approved	8	45	18	29	495
Approved	22	34	3	40	295
Total	13	41	13	33	790
<i>C: The impartiality and ethical standard of the selection process</i>					
Not approved	10	43	8	39	494
Approved	23	30	0	46	296
Total	15	38	5	42	790
<i>D: Your general confidence in the selection process</i>					
Not approved	11	39	25	25	494
Approved	36	37	0	26	296
Total	20	38	16	26	790

Source: NIFU survey in 2021 of Spark applicants (2019 and 2020 Spark calls).

* When asked to specify the SNSF funding which was their main reference for comparison, 52% answered Project funding, 13% Ambizone and 9% Postdoc.Mobility and the rest mentioned a variety of other schemes (table in Appendix).

Appendix 2 Overview interviewees

Name	Institution	Member of SNSF Research Council
Prof. Elliot Ash	ETH Zürich	
Prof. Nina Buchmann	ETH Zürich	Previous member
Prof. Karl Gademann	University of Zürich	Yes
Dr. Stefan Graf	University of St.Gallen	
Prof. Sabine Hahn	Bern University of Applied Sciences	
Marc Hutmacher	SNSF Administrative Office	
Sylvia Jeney	SNSF Administrative Office	
Prof. Claudia Mareis	University of Applied Sciences and Arts Northwestern Switzerland	Yes
Vanja Michel	SNSF Administrative Office	
Prof. Oliver Mühleemann	University of Bern	Yes
Annemarie Renier	SNSF Administrative Office	
Prof. Ola Söderström	University of Neuchâtel	Previous member
Prof. Christoph Weder	University of Fribourg	

Appendix 3 Questionnaire to Spark applicants

Appendix 3 Questionnaire to Spark applicants

The Spark pilot for rapid funding of unconventional ideas: Survey to applicants

Spark is under evaluation and your opinion matters! This survey goes to all main applicants in the 2019 and 2020 Spark calls for proposals. The purpose is to learn about the applicants' experiences and provide the SNSF with recommendations on how to set up future funding instruments for unconventional ideas. The experiences of both successful and unsuccessful applicants in all fields of research are of great value to design an SNSF funding portfolio adequate to serve the multiple goals and needs in Swiss research.

Background and motivation for your Spark proposal

1. Why did you apply for a Spark grant? Please indicate your motivations on the scale from 1 to 5.

	5 = To a great extent	4	3	2	1 = Not at all	Cannot say
a) I needed funding for a project idea which was developed before I learnt about the Spark call.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) I developed a new project idea that was motivated by the Spark call.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) It was an opportunity to address ideas with limited basis in previous research (i.e. unconventional research).	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
d) It was an opportunity to test high risk/high impact research ideas*.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
e) It was an opportunity to address interdisciplinary research ideas.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
f) The project did not fit to other funding instruments of the SNSF.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
g) I was motivated by the possibility of being assessed exclusively on the project description (because the identity and CV of the applicants were not to be disclosed to the evaluators).	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
h) I saw the proposal/project as a step in building an academic career.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
i) My colleagues/head of lab/department encouraged me to apply for a Spark grant.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
j) I had a project that needed to be implemented fast.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

* I.e. research ideas with a high probability of failure to get any significant results, but with a possible high impact on future research if successful.

Other motivations, please specify:

You have indicated that your project did not fit to other funding instruments of the SNSF. Please indicate the reason(s) for this (multiple replies possible):

- (1) Due to the novelty and unconventionality of the idea
- (2) Due to the riskiness of the project
- (3) Due to the limited preliminary data
- (4) Due to my eligibility: I was not employed by a research institution/university eligible for other SNSF funding instruments
- (5) Due to the limited duration and budget
- (6) It was at the intersection between SNSF and Innosuisse / between basic and applied research
- (7) Other (please specify): _____

2. What other funding have you applied and/or received for the project (multiple replies possible)?

Prior to the Spark call:

- (1) I had not considered applying for any other funding for the project.
- (2) I had unsuccessfully applied for funding for the project from (an)other SNSF funding scheme(s).
- (3) I had unsuccessfully applied for funding for the project from funding sources other than the SNSF.
- (4) I had already obtained some funding for the project from my/our home institution(s).
- (5) I had already obtained some funding for the project from (an)other SNSF funding scheme(s).
- (6) I had already obtained some funding for the project from other funding source(s) (than my home institution or SNSF).
- (7) I was hired* on a project where I did research that was the basis for the Spark proposal/project

After the Spark call:

- (1) My home institution(s) provided funding for the project.
- (2) I have unsuccessfully applied for funding for the project from other SNSF funding schemes.
- (3) I have unsuccessfully applied for funding for the project from funding sources other than the SNSF.
- (4) I have obtained funding for the project from other SNSF funding schemes.
- (5) I have obtained funding for the project from funding sources other than the SNSF.
- (7) I was hired* on a project where I can/could follow up my Spark project.
- (6) Other: (open space for indicating applied and received funding for the project) _____

*Please include projects where you are/were not principal investigator in this category.

Characteristics of the proposed Spark project

3. Compared to your other research, what characterised the Spark project you applied for?

	The Spark proposal was <u>less</u> so	The Spark proposal did not differ substantially	The Spark proposal was <u>more</u> so	Cannot say
a) It was based on a risky idea with significant chance of failure	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) Urgency of funding: Research opportunities would get lost if waiting	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) Urgency of funding: Research talent would get lost if waiting	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

Appendix 3 Questionnaire to Spark applicants

	The Spark proposal was <u>less</u> so	The Spark proposal did not differ substantially	The Spark proposal was <u>more</u> so	Cannot say
d) It was based on novel and/or unconventional ideas, perspectives or methods	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
e) I was confident that I would get positive results	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

Please specify other ways the Spark project resembled or differed from your other research:

4. In what way was the Spark project you applied for linked to your other research?

	5 = To a great extent	4	3	2	1 = Not at all	Cannot say/not applicable
a) It was inspired by my previous research	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) It built directly on previous project(s) where I was the principal investigator	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) It built directly on previous project(s) where I was <u>not</u> the principal investigator	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
d) It was part of/closely linked to my overall research agenda	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
e) It was part of an overall project for which I/my group had obtained other research funding/grants	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
f) It built on a previous project proposal which was adapted to fit the Spark Call	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
g) It was a continuation of my postdoc project	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
h) I had (or would have) to acquire new competences for the Spark project	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
i) I had (or would have) to resign from (an)other project(s) to work on the Spark project	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
j) I had (or would have to) put other projects on hold to work on the Spark project	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
k) I (could have) work(ed) in parallel with the Spark project and (an)other project(s)	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

The Spark application and selection process

5. Considering your Spark application, to what extent did you find the following issues and processes satisfactory?

	5 = To a great extent	4	3	2	1 = Not at all	Cannot say
a) The clarity of the terms and requirements for proposals: call documents, regulations and eligibility criteria	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) The support during the application process from the SNSF	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) The competence of the experts reviewing the proposals	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
d) The transparency regarding funding decisions	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
e) The clarity and completeness of the feedback to applicants	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
f) The time and efforts needed to prepare a proposal	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
g) The anonymised proposals/the double-blinded review process	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

6. Based on the anonymous review reports you received (in case of a negative decision*), to what degree do you think the reviewers who assessed your Spark proposal:

	5 = To a great extent	4	3	2	1 = Not at all	Cannot say/did not receive any review
a) Were able to assess all the fields of research involved in the application?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) Provided an open-minded/unbiased assessment of your application?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) Provided a thorough assessment of your application?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
d) Were able to guess your identity or identify your research environment from reading your project description?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

*Review reports were to be sent all rejected applicants. Funded applicants only received the report if they asked for it.

Appendix 3 Questionnaire to Spark applicants

The Spark terms/framework conditions

7. In your opinion, to what degree did the Spark pilot provide the appropriate policies and review procedures to:

	5 = To a great extent	4	3	2	1 = Not at all	Cannot say
a) Support well-founded and solid research?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) Support original and groundbreaking research?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) Support research ideas with limited basis in previous research (i.e. unconventional research)?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
d) Support high-risk* research?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
e) Tolerate the funding of research with negative or no results?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
f) Facilitate interdisciplinary research?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
g) Support research ideas with a need for rapid funding?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
h) Promote the career of young investigators/researchers?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
i) Fill a gap in the Swiss research funding landscape?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

* I.e. support research ideas with a high probability to fail, but with a possible high impact on future research if successful.

8. Compared to grant proposals you have submitted to other* SNSF funding schemes, did you spend less, about the same or more time on preparing your Spark proposal?

- (1) Less time
 (2) About the same time
 (3) Less than some but more than other grant proposals I have submitted
 (4) More time
 (5) Do not remember / Cannot say
 (6) Not applicable, I have not submitted other grant proposals to the SNSF

9. Comparing the Spark pilot to other* SNSF funding schemes you are familiar with, was Spark poorer, about the same or better, concerning:

	Better	About the same	Poorer	Cannot say/not applicable
a) Reviewer competence	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) The transparency of the selection process	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) The impartiality and ethical standard of the selection process	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
d) Your general confidence in	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

	Better	About the same	Poorer	Cannot say/not applicable
the selection process				
e) Flexibility of use of funds	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
f) Seed funding to generate preliminary data	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
g) Possibility to explore and experiment with new ideas/openings in research	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
h) Grants available for young research talents	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
i) Adequacy for your career level	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
j) Adequacy for your funding needs	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

*Please specify the SNSF funding scheme which is the main reference for your comparisons in the above questions:

- (1) Project funding/Projects in all disciplines
- (2) Singeria - interdisciplinary, collaborative, breakthrough
- (3) NRP
- (4) NCCR
- (5) Longitudinal studies
- (6) r4d programme
- (7) IICT
- (8) COST
- (9) BRIDGE
- (10) SPIRIT
- (11) Doc.CH
- (12) MD-PhD programme
- (13) Postdoc Mobility
- (14) Ambizione
- (15) PRIMA
- (16) Eccellenza
- (17) Practice-to-Science
- (18) Other

Other SNSF funding scheme:

10. To what extent do the terms of the Spark pilot fit the needs you see for rapid funding of unconventional research in Switzerland concerning:

	5 = To a great extent	4	3	2	1 = Not at all	Cannot say
a) Speed of the application and selection process	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) Amount of funding	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) Project duration	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
d) Categories of researchers eligible for grants	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
e) Grants available for young research talents	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

Appendix 3 Questionnaire to Spark applicants

5 = To a great extent 4 3 2 1 = Not at all Cannot say

f) Types of institutions eligible for hosting the projects (5) (4) (3) (2) (1) (9,999)

The future of Spark

11. What kind of processes for selecting proposals - after initial review by the individual experts - would you prefer for a future Spark instrument?

- (1) Proposals selected based on the aggregated individual review scores, giving priority to proposals with a higher score on originality and unconventionality (i.e. as in the 2020 Spark call for proposals).
- (2) Proposals ranked by a review panel of experts based outside Switzerland (expert panel discussions).
- (3) Selection based on an algorithm (artificial intelligence) developed to identify original research among all proposal.
- (4) Random selection among all proposals assessed fundable by the individual experts.
- (5) Other, please specify: _____
- (9,999) Do not know

12. What aspects of Spark would you change for a future implementation?

Please indicate any changes you would like to see in the Spark instrument. Of particular interest are explication of the kind of process you prefer for the selection of proposals, and of changes in the terms and policies needed for better enabling the rapid funding of unconventional research.

Thank you for participating in the Spark applicant Survey!

Appendix 4 Questionnaire to Spark reviewers

Appendix 4 Questionnaires to Spark reviewers

The Spark pilot for rapid funding of unconventional ideas: Survey to reviewers

This survey goes to all experts who reviewed one or more proposals in the 2019 and 2020 Spark calls for proposals. The purpose is to learn about the reviewers' experiences with the Spark double blind review process and provide the SNSF with recommendations on how to set up future funding instruments for unconventional ideas. The experiences of reviewers in all fields of research are of great value to design an SNSF funding portfolio adequate to serve the multiple goals and needs in the research community and we kindly ask you to participate.

Your background

1. Your grant review experience. Please indicate the approximate number of grant proposals you have reviewed in the last 10 years.

	0	1-5	6-20	above 20
a) Grant proposals reviewed for the SNSF (not including Spark proposals)	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>
b) Grant proposals reviewed for other funding agencies	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>

2. Please indicate your current (main) position:

- (1) Full Professor/similar
- (2) Associate professor/similar
- (3) Lead Researcher/Head of Research/similar
- (4) Assistant professor/similar
- (5) Postdoctoral fellow/Researcher/similar
- (6) PhD student
- (7) Other position at a research/higher education institution
- (8) Position not at a research and/or higher education institution. Please specify: _____
- (9) On leave/retired/not working

3. Your age:

- (1) Below 30
- (2) 30-39
- (3) 40-49
- (4) 50-59
- (5) 60 or above

4. Country in which you work (main affiliation, if on leave/retired/not working, last main affiliation)

[list of 248 countries]

5. Please select your (main) field of research from the dropdown list below.

The list contains 42 (OECD) categories, numbered as follows: 1 Natural sciences; 2 Engineering and technology; 3 Medical sciences; 4 Agricultural sciences; 5 Social sciences; 6 Humanities; 7 Other. If you do not find your field of research on the list, please select the closest category. The categories are explained at the OECD web pages: <http://www.oecd.org/science/inno/38235147.pdf>.

- (1) 1.1 Mathematics
- (2) 1.2 Computer and information sciences
- (3) 1.3 Physical sciences
- (4) 1.4 Chemical sciences
- (5) 1.5 Earth and related environmental sciences
- (6) 1.6 Biological sciences
- (7) 1.7 Other natural sciences
- (8) 2.1 Civil engineering (including architecture engineering)
- (9) 2.2 Electrical engineering, electronic engineering, information engineering

- (10) 2.3 Mechanical engineering
- (11) 2.4 Chemical engineering
- (12) 2.5 Materials engineering
- (13) 2.6 Medical engineering
- (14) 2.7 Environmental engineering
- (15) 2.8 Environmental biotechnology
- (16) 2.9 Industrial Biotechnology
- (17) 2.10 Nano-technology
- (18) 2.11 Other engineering and technologies
- (19) 3.1 Basic medicine
- (20) 3.2 Clinical medicine
- (21) 3.3 Health sciences
- (22) 3.4 Health biotechnology
- (23) 3.5 Other medical sciences
- (24) 4.1 Agriculture, forestry, and fisheries
- (25) 4.2 Animal and dairy science
- (26) 4.3 Veterinary science
- (27) 4.4 Agricultural biotechnology
- (28) 4.5 Other agricultural sciences
- (29) 5.1 Psychology
- (30) 5.2 Economics and business
- (31) 5.3 Educational sciences
- (32) 5.4 Sociology (including anthropology and demography)
- (33) 5.5 Law
- (34) 5.6 Political Science
- (35) 5.7 Social and economic geography
- (36) 5.8 Media and communications
- (37) 5.7 Other social sciences
- (38) 6.1 History and archaeology
- (39) 6.2 Languages and literature
- (40) 6.3 Philosophy, ethics and religion
- (41) 6.4 Art (arts, history of arts, performing arts, music) (including architectural design)
- (42) 6.5 Other humanities
- (43) 7 Other (please specify below)

Other field:

Your experience with the Spark review criteria and process

6. Adequacy of the review criteria: The Spark review form asked for assessment on the following four criteria. For each of them, please indicate whether you think it is an adequate criterion when assessing proposals.

	5 = To a great extent	4	3	2	1 = Not at all	Cannot say
a) Originality/Novelty of the proposed project	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) Unconventionality of the idea	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) Scientific quality of the proposed project	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
d) Potential for significant impacts	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

7. Please explain any concerns with the adequacy of the review criteria:

Appendix 4 Questionnaires to Spark reviewers

8. Comprehensibility of criteria and ability to assess the Spark proposals. Please indicate to what extent you agree with the statements below.

	5 = To a great extent/in all cases	4	3	2	1 = Not at all/in no cases	Cannot remember/Can not say
a) The review criteria were clear and easy to understand.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) The review guidelines provided by the SNSF were clear and easy to understand.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) The proposal(s) I reviewed was/were close to my field of expertise.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
d) I was able to assess the 'Originality/Novelty' of the proposed project(s) assigned to me.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
e) I was able to assess the 'Unconventionality' of the proposed project(s) assigned to me.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
f) I was able to assess the 'Scientific quality' of the proposed project(s) assigned to me.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
g) I was able to assess the 'Potential for significant impacts' of the proposed project(s) assigned to me.	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

9. Please explain any concerns with the comprehensibility of criteria or ability to assess the proposal(s), or variation between the proposals you reviewed:

Difficulty of review and time needed compared to reviewing other grant proposals

10. Compared to grant proposals you have reviewed for other funding schemes, was/were the Spark proposal(s) less, about the same or more difficult to review?

Less difficult	About the same	More difficult	Cannot remember/Cannot say	Not applicable, I have not reviewed other grant proposals
(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(99) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

11. Compared to grant proposals you have reviewed for other funding schemes, did you spend less, about the same or more time (on average) on reviewing the Spark proposal(s)?

Less time	About the same time	More time	Cannot remember/Cannot say	Not applicable, I have not reviewed other grant proposals
(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(99) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

12. If the difficulty or time spent differed from your review of proposals to other funding schemes, please indicate why in the comment box below (e.g. anonymous/blinded proposals; more/less demanding review criteria; shorter project descriptions).

Your overall assessment of the Spark Pilot

13. Compared to other grant proposals you have reviewed, what characterised the Spark project(s) you reviewed?

	The Spark proposal(s) was/were less so	The Spark proposal(s) did not differ substantially	The Spark proposal(s) was/were more so	Cannot remember / Cannot say	Not applicable, I have not reviewed proposals for other funding schemes
a) The project ideas were well-prepared and clearly described	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(99) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) Urgency of funding: Research opportunities would get lost if rapid funding was not provided	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(99) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) The project description(s) contained unconventional research ideas, perspectives and/or methods	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(99) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
d) The research questions were clearly linked to an existing line of research	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(99) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
e) The proposed research involved multiple disciplines of research	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(99) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
f) The project(s) aimed at testing high risk/high impact research ideas*	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(99) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

*I.e research ideas with a high probability of failure to get any significant results, but with a possible high impact on future research if successful.

Please elaborate how the Spark proposals differed from other proposals you have reviewed. If you have review experiences from other funding schemes for unconventional or high-risk research, please also indicate main differences/experiences compared to Spark:

14. In your opinion, to what degree did the Spark pilot provide the appropriate policies and review procedures to:

	5 = To a great extent	4	3	2	1 = Not at all	Cannot remember / Cannot say
a) Support original and ground-breaking research?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
b) Support high-risk* research?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
c) Facilitate interdisciplinary research?	(5) <input type="checkbox"/>	<input type="checkbox"/> (4)	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

Appendix 4 Questionnaires to Spark reviewers

	5 = To a great extent	4	3	2	1 = Not at all	Cannot remember / Cannot say
d) Support research ideas with limited basis in previous research (i.e. unconventional research)?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>
e) Support research that needs to be implemented fast?	(5) <input type="checkbox"/>	(4) <input type="checkbox"/>	(3) <input type="checkbox"/>	(2) <input type="checkbox"/>	(1) <input type="checkbox"/>	(9,999) <input type="checkbox"/>

*I.e. support research ideas with a high probability to fail, but with a possible high impact on future research if successful.

15. Overall, do you think the blinding of applicants' identities was conducive to supporting unconventional research?

- (1) Yes
 (2) No
 (3) The blinding made little difference
 (4) It was not really blinded - I could guess the identity of the applicant(s)
 (9,999) Cannot remember / Cannot say

Please explain your reply (e.g. how full focus on the project description and no information on track record of applicants may help identify unconventional research, why information about applicants is needed to assess research, or why it does not matter):

16. Differences between the 2019 and 2020 Spark calls: If you reviewed proposals both for the 2019 and 2020 Spark calls, please indicate below any differences (positive or negative) you remember between the calls.

17. Suggestions for future SNSF funding schemes for unconventional research. If you have suggestions for improvements of the Spark instrument (e.g. concerning criteria and review process), or more general views on how to identify and fund unconventional research, please use the space below. Of special interest are review experiences you may have from other funding schemes aimed at unconventional or high-risk research which Spark may learn from.

Final comments

18. If you have any further comments regarding your experience with evaluating Spark proposal(s), or any of your previous replies, please use the space below.

Thank you for participating in the Spark reviewer survey!

Appendix 5 Results from Spark applicant survey

Results from the Applicant Survey

NIFU

September 2021

Table 1 Number of Respondents by Field

	Life	STEM	SSH	Total
Cantonal university	256	77	139	472
ETH Domain	56	129	19	204
University of applied sciences	18	53	73	144
University of Teacher Education	0	0	12	12
Other	19	5	14	38
Total	349	264	257	870

Table 2 Descriptives Statistics

Variable	Count	Percentage	Total
Institution: Cantonal university	472	54	870
Institution: ETH Domain	204	23	870
Institution: University of applied sciences	144	17	870
Institution: University of Teacher Education	12	1	870
Institution: Other	38	4	870
Field: Life	349	40	870
Field: SSH	257	30	870
Field: Stem	264	30	870
Gender: Female	303	35	870
Gender: Male	567	65	870
Age: 30 and younger	22	3	869
Age: 30 to 39 years old	483	56	869
Age: 40 to 49 years old	263	30	869
Age: 50 to 59 years old	84	10	869
Age: 60 years and more	17	2	869
Function: Department leader	43	5	869
Function: Leader	188	22	869
Function: Researcher	239	28	869
Function: Junior Researcher	399	46	869
Call: July 2019	399	46	870
Call: June 2020	132	15	870
Call: March 2020	339	39	870
Approved Proposal: No	559	64	870
Approved Proposal: Yes	311	36	870
Contract Type: Fixed contract or no contract	578	67	869
Contract Type: Permanent	291	33	869

Question 1 Motivation for applying

Why did you apply for a Spark grant? Please indicate your motivations on the scale from 1 to 5.

Answer	5 = To a great extent
C: It was an opportunity to address ideas with limited basis in previous research	50
D: It was an opportunity to test high risk/high impact research ideas	50
G: I was motivated by the possibility of being assessed exclusively on the project description	46
H: I saw the proposal/project as a step in building an academic career.	44
A: I needed funding for a project idea which was developed before I learnt about the Spark call.	34
F: The project did not fit to other funding instruments of the SNSF.	34
E: It was an opportunity to address interdisciplinary research ideas.	32
I: My colleagues/head of lab/department encouraged me to apply for a Spark grant.	24
B: I developed a new project idea that was motivated by the Spark call.	22
J: I had a project that needed to be implemented fast.	21

Answer	1 = Not at all	2	3	4	5 = To a great extent	Cannot say	Total	Freq
C: Unconventional research	2	4	10	33	50	1	100	859
D: Risky research	3	4	13	28	50	2	100	860
G: Assessed exclusively on the project	11	8	14	19	46	1	100	859
H: Career advancement	14	8	13	20	44	1	100	857
A: Developed before Spark	14	13	13	23	34	1	100	858
F: Did not fit other Spark instruments	9	12	17	21	34	7	100	858
E: Interdisciplinary research	11	14	20	22	32	1	100	857
I: Encouraged by colleagues	29	11	14	17	24	4	100	856
B: Motivated by Spark	26	18	14	20	22	1	100	856
J: Fast implementation needed	18	17	21	22	21	1	100	854

Question 1b Why the project did not fit other funding instruments of the SNSF

You have indicated that your project did not fit to other funding instruments of the SNSF. Please indicate the reason(s) for this (multiple replies possible):

Answer	Selected	Not selected	Total	Freq
Due to the novelty and unconventionality of the idea	62	38	100	473
Due to the limited preliminary data	59	41	100	473
Due to the riskiness of the project	49	51	100	473
Due to the limited duration and budget	28	72	100	473
Due to my eligibility: I was not employed by a institution eligible for other SNSF funding	23	77	100	473
Other	15	85	100	473
It was at the intersection between SNSF and Innosuisse/ basic and applied research	14	86	100	473

Question 2 Other funding prior to the Spark Call

What other funding have you applied and/or received for the project (multiple replies possible)? Prior to the Spark call:

Answer	Selected	Not selected	Total	Freq
I had not considered applying for any other funding for the project	62	38	100	870
I had unsuccessfully applied for funding from funding sources other than SNSF	14	86	100	870
I was hired* on a project that was the basis for the Spark proposal	12	88	100	870
I had unsuccessfully applied for funding from (an)other SNSF	10	90	100	870
I had already obtained some funding from my/our home institution(s)	8	92	100	870
I had already obtained some funding from other funding source(s)	7	93	100	870
I had already obtained some funding from (an)other SNSF	2	98	100	870

Question 2b After the Spark call

Answer	Selected	Not selected	Total	Freq
My home institution(s) provided funding for the project	14	86	100	870
I have obtained funding from funding sources other than the SNSF.	14	86	100	870
I have unsuccessfully applied for funding from funding sources other than the SNSF	12	88	100	870
I have unsuccessfully applied for funding from other SNSF funding schemes	6	94	100	870
I was hired* on a project where I can/could follow up my Spark project.	6	94	100	870
I have obtained funding from other SNSF	3	97	100	870
Other	41	59	100	870

Question 3 Characterization of the applicants research project

Compared to your other research what characterised the Spark project you applied for?

Answers	Spark more so
D: It was based on novel and/or unconventional ideas, perspectives or methods	82
A: It was based on a risky idea with significant chance of failure	60
B: Urgency of funding: Research opportunities would get lost if waiting	38
E: I was confident that I would get positive results	37
C: Urgency of funding: Research talent would get lost if waiting	31

Answers	Spark more so	No difference	Spark less so	Cannot say	Total	Freq
D: Novel and unconventional idea	82	13	2	2	100	842
A: Risky idea with change of failure	60	27	6	7	100	839
B: Research opportunity could be lost	38	34	16	12	100	833
E: Confident of positive results	37	36	13	14	100	837
C: Research talent could be lost	31	33	18	17	100	825

Question 4 The Spark project linked to the applicants other research projects

In what way was the Spark project you applied for linked to your other research?

Answer	5 = To a great extent
A: It was inspired by my previous research	49
K: I (could have) work(ed) in parallel with the Spark project and (an)other project(s)	33
D: It was part of/closely linked to my overall research agenda	32
B: It built directly on previous project(s) where I was the principal investigator	19
H: I had (or would have) to acquire new competences for the Spark project	19
C: It built directly on previous project(s) where I was not the principal investigator	10
E: It was part of an overall project for which I/my group had obtained other research funding/grants	6
G: It was a continuation of my postdoc project	6
J: I had (or would have to) put other projects on hold to work on the Spark project	5
F: It built on a previous project proposal which was adapted to fit the Spark Call	4
I: I had (or would have) to resign from (an)other project(s) to work on the Spark project	4

Answer	1 = Not at all	2	3	4	5 = To a great extent	Cannot say/not applicable	Total	Freq
A: Inspired by earlier work	5	6	12	27	49	0	100	839
K: I parallel with other project	7	10	18	28	33	4	100	834
D: Linked to my research agenda	6	12	17	32	32	1	100	836
B: Earlier work w/ me as investigator	29	15	16	14	19	8	100	836
H: I needed new competences for Spark	18	11	23	27	19	3	100	829
C: Earlier work without me as investigator	42	15	14	13	10	5	100	830
E: Part of an project where I had funding	51	20	10	9	6	4	100	829
G: Postdoc project	62	10	8	7	6	6	100	829
J: Other project on hold to attain Spark	46	18	17	9	5	5	100	828
F: Previous proposals adapted to Spark	67	12	7	6	4	3	100	829
I: I resigned another project for Spark	65	12	8	5	4	6	100	830

Question 5 Satisfaction

Answer	5 = To a great extent
G: The anonymised proposals/the double-blinded review process	55
A: The clarity of the terms and requirements for proposals	46
B: The support during the application process from the SNSF	36
F: The time and efforts needed to prepare a proposal	31
D: The transparency regarding funding decisions	25
C: The competence of the experts reviewing the proposals	20
E: The clarity and completeness of the feedback to applicants	19

Answer	1 = Not at all	2	3	4	5 = To a great extent	Cannot say	Total	Freq
G: Double-blinded review	6	5	9	22	55	3	100	832
A: Clarity of terms	2	7	12	32	46	1	100	832
B: Support during application	3	5	15	23	36	17	100	833
F: Efforts needed to prepare proposal	1	4	20	42	31	1	100	832
D: Transparency of decisions	12	13	19	24	25	7	100	834
C: Competence of reviewers	8	13	18	19	20	20	100	832
E: Feedback to applicants	12	16	20	25	19	8	100	829

Question 6 Applicants opinions of the reviewers

Based on the anonymous review reports you received (in case of a negative decision*), to what degree do you think the reviewers who assessed your Spark proposal

Answer	5 = To a great extent
B: Provided an open-minded/unbiased assessment of your application?	13
C: Provided a thorough assessment of your application?	12
A: Were able to assess all the fields of research involved in the application?	11
D: Were able to guess your identity or identify your research environment from reading your project description?	6

Answer	1 = Not at all	2	3	4	5 = To a great extent	Cannot say/did not receive any review	Total	Freq
B: Open-minded assessment	8	13	17	20	13	29	100	812
C: Thorough assessment	9	14	20	16	12	29	100	810
A: Assess all the fields involved	7	13	20	20	11	30	100	813
D: Able to identify you	20	12	11	10	6	41	100	812

Question 7 Did Spark provide appropriate policies?

In your opinion, to what degree did the Spark pilot provide the appropriate policies and review procedures to:

Answer	5 = To a great extent
I: Fill a gap in the Swiss research funding landscape?	58
C: Support research ideas with limited basis in previous research (i.e. unconventional research)?	40
B: Support original and ground-breaking research?	38
H: Promote the career of young investigators/researchers?	37
D: Support high-risk* research?	36
G: Support research ideas with a need for rapid funding?	28
E: Tolerate the funding of research with negative or no results?	23
F: Facilitate interdisciplinary research?	22
A: Support well-founded and solid research?	21

Answer	1 = Not at all	2	3	4	5 = To a great extent	Cannot say	Total	Freq
I: Fill a gap in the Swiss research funding	2	3	10	17	58	10	100	816
C: Support unconventional research	4	7	11	26	40	12	100	816
B: Support original research	3	7	11	28	38	14	100	818
H: Promote young researchers	4	10	13	18	37	17	100	815
D: Support high-risk* research	4	8	11	25	36	15	100	814
G: Support urgent research	4	8	15	28	28	17	100	811
E: Tolerate negative or no results	8	9	12	21	23	27	100	813
F: Support interdisciplinarity	4	8	19	23	22	23	100	818
A: Support solid research	3	8	21	30	21	17	100	817

Question 8 After the Spark call

Compared to grant proposals you have submitted to other* SNSF funding schemes, did you spend less, about the same or more time on preparing your Spark proposal?

After Spark call	Freq	Percentage
Less time	375	46
About the same time	179	22
Less than some but more than other grant proposals I have submitted	70	9
More time	12	2
Do not remember / Cannot say	17	2
Not applicable, I have not submitted other grant proposals to the SNSF	161	20
Total	814	100

Question 9 Spark compared to other SNSF funding schemes

Comparing the Spark pilot to other* SNSF funding schemes you are familiar with, was Spark poorer, about the same or better, concerning

Answer	Better
G: Possibility to explore and experiment with new ideas/openings in research	58
H: Grants available for young research talents	48
F: Seed funding to generate preliminary data	42
I: Adequacy for your career level	37
J: Adequacy for your funding needs	31
E: Flexibility of use of funds	23
D: Your general confidence in the selection process	20
C: The impartiality and ethical standard of the election process	15
B: The transparency of the selection process	13
A: Reviewer competence	8

Answer	Better	About the same	Poorer	Cannot say/not applicable	Total	Freq
G: Possibility to explore	58	14	4	24	100	787
H: Grants for young research talents	48	16	4	32	100	790
F: Generate preliminary data	42	16	3	38	100	785
I: Adequacy for career level	37	31	6	26	100	784
J: Adequacy for funding needs	31	32	13	24	100	782
E: Flexibility of use of funds	23	33	4	40	100	788
D: Confidence in the selection process	20	38	16	26	100	790
C: The impartiality of election	15	38	5	42	100	790
B: Transparency of selection	13	41	13	33	100	790
A: Reviewer competence	8	32	16	44	100	792

Your main reference of comparison

Please specify the SNSF funding scheme which is the main reference for your comparisons in the above questions:

Main reference of comparison	Freq	Percentage
Project funding/Projects in all disciplines	339	52
Ambizione	84	13
Postdoc Mobility	58	9
Other	43	7
Eccellenza	28	4
BRIDGE	26	4
NRP	17	3
PRIMA	17	3
Singeria - interdisciplinary, collaborative, breakthrough	15	2
NCCR	6	1
Practice-to-Science	6	1
COST	5	1
SPIRIT	3	0
Doc.CH	3	0
MD-PhD programme	3	0
r4d programme	1	0
IICT	1	0
Total	655	100

Question 10 Do Spark fit the needs for unconventional research?

To what extent do the terms of the Spark pilot fit the needs you see for rapid funding of unconventional research in Switzerland concerning:

Answer	5 = To a great extent
E: Grants available for young research talents	50
D: Categories of researchers eligible for grants	49
A: Speed of the application and selection process	40
F: Types of institutions eligible for hosting the projects	38
B: Amount of funding	22
C: Project duration	18

Answer	1 = Not at all	2	3	4	5 = To a great extent	Cannot say	Total	Freq
E: Availability for young researcher	2	4	9	24	50	11	100	811
D: Types of researchers eligible	2	4	11	26	49	8	100	810
A: Speed	3	6	14	33	40	3	100	816
F: Types of institutions eligible	2	2	12	26	38	20	100	807
B: Amount of funding	2	10	29	34	22	3	100	813
C: Project duration	4	13	30	34	18	2	100	813

Question 11 Preferences of future Spark instruments

What kind of processes for selecting proposals - after initial review by the individual experts - would you prefer for a future Spark instrument?

Preferences for future Spark instruments	Freq	Percentage
Selected on individual review scores, giving priority to originality and unconventionality (as 2020 Spark)	386	47
Proposals ranked by a review panel of experts based outside Switzerland (expert panel discussions).	190	23
Random selection among all proposals assessed fundable by the individual experts.	114	14
Do not know	65	8
Selection based on an algorithm developed to identify original research among all proposal.	34	4
Other	28	3
Total	817	100

Spark Applicants by backgroundvariables regressions

NIFU

September 2021

Question 1 Motivation for applying

Why did you apply for a Spark grant? Please indicate your motivations on the scale from 1 to 5.

OLS regression with the following as dependent variable in the ten regression models:

- 1) I needed funding for a project idea which was developed before I learnt about the Spark call.
- 2) I developed a new project idea that was motivated by the Spark call.
- 3) It was an opportunity to address ideas with limited basis in previous research (i.e. unconventional research).
- 4) It was an opportunity to test high risk/high impact research ideas*.
- 5) It was an opportunity to address interdisciplinary research ideas.
- 6) The project did not fit to other funding instruments of the SNSF.
- 7) I was motivated by the possibility of being assessed exclusively on the project description (because the identity and CV of the applicants were not to be disclosed to the evaluators).
- 8) I saw the proposal/project as a step in building an academic career.
- 9) My colleagues/head of lab/department encouraged me to apply for a Spark grant.
- 10) I had a project that needed to be implemented fast.

Dependent variable:										
Question 1										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Female	-0.036 (0.108)	-0.036 (0.114)	-0.005 (0.071)	0.025 (0.075)	0.068 (0.101)	0.107 (0.103)	0.143 (0.103)	0.292*** (0.095)	0.048 (0.115)	-0.048 (0.106)
Function: Leader	-0.042 (0.137)	0.051 (0.144)	-0.070 (0.089)	0.131 (0.094)	-0.206 (0.128)	-0.057 (0.129)	-0.446*** (0.130)	-0.949*** (0.119)	-0.837*** (0.146)	-0.048 (0.133)
Function: Junior	-0.176 (0.130)	0.038 (0.136)	-0.164* (0.084)	-0.081 (0.089)	-0.109 (0.121)	-0.245** (0.124)	0.110 (0.122)	0.451*** (0.112)	0.362*** (0.136)	-0.138 (0.125)
Permanent Position	-0.205* (0.121)	-0.136 (0.127)	-0.055 (0.079)	-0.223*** (0.084)	-0.206* (0.113)	-0.228** (0.116)	-0.012 (0.115)	-0.472*** (0.105)	-0.234* (0.129)	-0.279** (0.118)
Field: SSH	-0.324*** (0.122)	0.253** (0.128)	0.017 (0.079)	-0.192** (0.084)	0.411*** (0.113)	0.134 (0.115)	0.043 (0.115)	-0.063 (0.106)	-0.250* (0.128)	-0.352*** (0.118)
Field: STEM	-0.056 (0.121)	-0.033 (0.128)	-0.161** (0.080)	0.007 (0.083)	0.039 (0.113)	0.101 (0.117)	-0.248** (0.116)	-0.248** (0.106)	-0.110 (0.128)	-0.210* (0.118)
Approved Call	0.083 (0.112)	0.111 (0.118)	0.245*** (0.073)	0.371*** (0.077)	0.114 (0.104)	-0.086 (0.107)	0.147 (0.106)	0.161* (0.097)	0.085 (0.118)	-0.137 (0.109)
Call: March 2020	-0.155 (0.115)	0.146 (0.122)	0.010 (0.075)	0.027 (0.079)	-0.078 (0.108)	-0.177 (0.110)	-0.103 (0.110)	0.087 (0.100)	0.125 (0.122)	0.057 (0.112)
Call: June 2020	-0.258* (0.154)	0.054 (0.161)	0.165* (0.100)	0.011 (0.105)	0.019 (0.143)	-0.197 (0.145)	0.086 (0.145)	0.018 (0.133)	0.173 (0.161)	0.059 (0.148)
Constant	3.869*** (0.160)	2.810*** (0.168)	4.295*** (0.103)	4.179*** (0.109)	3.517*** (0.148)	3.873*** (0.152)	3.878*** (0.151)	3.831*** (0.138)	3.077*** (0.166)	3.501*** (0.154)
Observations	845	848	851	846	845	798	848	849	820	843
R ²	0.021	0.010	0.027	0.052	0.033	0.015	0.045	0.260	0.126	0.021
Adjusted R ²	0.010	-0.001	0.017	0.042	0.022	0.003	0.035	0.252	0.116	0.010

Note:

* p<0.1; ** p<0.05; *** p<0.01

Question 1b Why the project did not fit other funding instruments of the SNSF

You have indicated that your project did not fit to other funding instruments of the SNSF. Please indicate the reason(s) for this (multiple replies possible):

Binary logistic regressions with the following seven answers as dependent variables:

- 1) Due to the novelty and unconventionality of the idea
- 2) Due to the riskiness of the project
- 3) Due to the limited preliminary data
- 4) Due to my eligibility: I was not employed by a research institution/university eligible for other SNSF funding instruments
- 5) Due to the limited duration and budget
- 6) It was at the intersection between SNSF and Innosuisse / between basic and applied research
- 7) Other (please specify):

	<i>Dependent variable:</i>						
	Question 1b						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female	-0.024 (0.210)	-0.426** (0.206)	-0.247 (0.206)	-0.054 (0.248)	-0.321 (0.229)	-0.895*** (0.331)	-0.017 (0.283)
Function: Leader	0.436* (0.263)	0.272 (0.254)	0.419 (0.256)	-1.129*** (0.380)	-0.222 (0.277)	-0.189 (0.345)	-0.562 (0.359)
Function: Junior	-0.133 (0.250)	-0.352 (0.250)	-0.081 (0.246)	0.327 (0.280)	-0.109 (0.269)	0.024 (0.359)	-0.077 (0.325)
Permanent Position	-0.089 (0.234)	-0.493** (0.231)	-0.160 (0.229)	-0.677** (0.307)	0.007 (0.250)	0.800** (0.320)	0.093 (0.311)
Field: SSH	0.673*** (0.241)	-0.556** (0.235)	-0.397* (0.234)	0.164 (0.281)	-0.351 (0.259)	0.137 (0.339)	0.032 (0.326)
Field: STEM	0.412* (0.236)	-0.086 (0.234)	-0.258 (0.238)	-0.207 (0.287)	-0.121 (0.251)	0.166 (0.330)	0.247 (0.315)
Approved Call	-0.065 (0.218)	0.339 (0.217)	-0.014 (0.218)	-0.488* (0.263)	-0.062 (0.238)	0.166 (0.305)	0.124 (0.285)
Call: March 2020	0.204 (0.228)	-0.079 (0.225)	-0.142 (0.225)	-0.438 (0.273)	0.267 (0.244)	0.141 (0.322)	-0.252 (0.302)
Call: June 2020	0.259 (0.294)	0.114 (0.286)	-0.060 (0.286)	0.027 (0.324)	0.233 (0.310)	0.348 (0.394)	-0.573 (0.426)
Constant	0.026 (0.296)	0.429 (0.295)	0.712** (0.297)	-0.619* (0.342)	-0.692** (0.318)	-2.059*** (0.424)	-1.523*** (0.390)
Observations	473	473	473	473	473	473	473
Log Likelihood	-307.608	-314.590	-314.387	-234.519	-278.048	-185.627	-200.143
Akaike Inf. Crit.	635.216	649.180	648.774	489.038	576.095	391.254	420.287

Note:

*p<0.1; **p<0.05; ***p<0.01

Question 2 Other funding prior to the Spark Call

What other funding have you applied and/or received for the project (multiple replies possible)? Prior to the Spark call:

Binary logistic regressions with the following seven answers as dependent variables:

- 1) I had not considered applying for any other funding for the project.
- 2) I had unsuccessfully applied for funding for the project from (an)other SNSF funding scheme(s).
- 3) I had unsuccessfully applied for funding for the project from funding sources other than the SNSF.
- 4) I had already obtained some funding for the project from my/our home institution(s).
- 5) I had already obtained some funding for the project from (an)other SNSF funding scheme(s).
- 6) I had already obtained some funding for the project from other funding source(s) (than my home institution or SNSF).
- 7) I was hired* on a project where I did research that was the basis for the Spark proposal/project

	<i>Dependent variable:</i>						
	Question 2						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female	-0.026 (0.155)	-0.122 (0.262)	0.168 (0.214)	0.078 (0.270)	-0.168 (0.521)	0.043 (0.287)	0.074 (0.241)
Function: Leader	0.442** (0.197)	-0.534* (0.311)	-0.391 (0.285)	-0.542 (0.344)	-0.181 (0.529)	-0.668* (0.363)	-1.517*** (0.511)
Function: Junior	0.252 (0.183)	-0.475 (0.294)	-0.115 (0.252)	-0.305 (0.315)	-0.859 (0.631)	-0.470 (0.326)	0.428 (0.280)
Permanent Position	0.042 (0.173)	0.204 (0.276)	-0.152 (0.248)	0.306 (0.298)	0.753 (0.522)	0.197 (0.311)	-0.948*** (0.361)
Field: SSH	0.607*** (0.176)	-0.369 (0.299)	-0.781*** (0.261)	-0.082 (0.294)	0.910 (0.629)	0.227 (0.313)	-0.819*** (0.307)
Field: STEM	0.421** (0.173)	0.061 (0.276)	-0.316 (0.236)	-0.566* (0.333)	1.118* (0.623)	-0.090 (0.344)	-0.004 (0.250)
Approved Call	0.004 (0.160)	-0.412 (0.271)	-0.025 (0.223)	0.636** (0.278)	0.741 (0.501)	-0.091 (0.302)	-0.258 (0.247)
Call: March 2020	0.162 (0.165)	-0.539* (0.279)	-0.274 (0.234)	0.323 (0.286)	0.800 (0.558)	-0.141 (0.309)	-0.274 (0.254)
Call: June 2020	0.301 (0.222)	-0.051 (0.336)	-0.028 (0.298)	-0.686 (0.506)	1.205* (0.649)	-0.186 (0.412)	-0.179 (0.333)
Constant	-0.159 (0.224)	-1.528*** (0.343)	-1.286*** (0.302)	-2.449*** (0.398)	-5.202*** (0.855)	-2.226*** (0.402)	-1.469*** (0.339)
Observations	869	869	869	869	869	869	869
Log Likelihood	-567.810	-267.315	-341.979	-235.184	-91.069	-219.964	-279.647
Akaike Inf. Crit.	1,155.620	554.631	703.959	490.368	202.139	459.928	579.295

Note:

*p<0.1; **p<0.05; ***p<0.01

Question 2b After the Spark call

Binary logistic regressions with the following seven answers as dependent variables:

- 1) My home institution(s) provided funding for the project.
- 2) I have unsuccessfully applied for funding for the project from other SNSF funding schemes.
- 3) I have unsuccessfully applied for funding for the project from funding sources other than the SNSF.
- 4) I have obtained funding for the project from other SNSF funding schemes.
- 5) I have obtained funding for the project from funding sources other than the SNSF.
- 6) I was hired* on a project where I can/could follow up my Spark project.
- 7) Other: (open space for indicating applied and received funding for the project)

	<i>Dependent variable:</i>						
	Question 2b						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female	-0.087 (0.220)	-0.293 (0.321)	-0.350 (0.238)	0.411 (0.415)	0.035 (0.215)	0.028 (0.311)	0.285* (0.152)
Function: Leader	0.005 (0.294)	-0.481 (0.404)	0.105 (0.292)	0.772 (0.552)	0.015 (0.273)	-0.637 (0.628)	-0.175 (0.192)
Function: Junior	0.534** (0.268)	-0.290 (0.346)	-0.117 (0.274)	0.449 (0.588)	0.019 (0.259)	0.951** (0.418)	-0.330* (0.181)
Permanent Position	0.116 (0.249)	-0.379 (0.357)	-0.442* (0.266)	0.491 (0.462)	-0.008 (0.241)	-0.757 (0.483)	0.214 (0.170)
Field: SSH	-0.088 (0.248)	-0.402 (0.360)	-0.329 (0.260)	-0.409 (0.509)	-0.572** (0.252)	-0.210 (0.382)	0.222 (0.171)
Field: STEM	-0.004 (0.236)	-0.176 (0.334)	-0.390 (0.259)	0.023 (0.460)	-0.308 (0.237)	0.270 (0.328)	0.068 (0.174)
Approved Call	0.682*** (0.213)	-0.718** (0.340)	-0.769*** (0.260)	0.141 (0.423)	-0.112 (0.221)	0.514* (0.305)	0.016 (0.160)
Call: March 2020	-0.391* (0.230)	-0.420 (0.320)	-0.083 (0.238)	-0.789 (0.481)	-0.411* (0.230)	-0.163 (0.342)	0.364** (0.164)
Call: June 2020	-0.848** (0.366)	-0.518 (0.451)	-0.515 (0.354)	-1.100 (0.777)	-0.482 (0.320)	0.459 (0.394)	0.475** (0.215)
Constant	-2.078*** (0.327)	-1.622*** (0.399)	-1.167*** (0.318)	-3.789*** (0.673)	-1.333*** (0.304)	-3.298*** (0.512)	-0.664*** (0.226)
Observations	869	869	869	869	869	869	869
Log Likelihood	-342.950	-199.895	-311.352	-117.801	-347.532	-188.551	-575.823
Akaike Inf. Crit.	705.900	419.789	642.704	255.602	715.065	397.103	1,171.646

Note:

*p<0.1; **p<0.05; ***p<0.01

Question 3 Characterization of the applicants research project

Compare to your other research what characterized the Spark project you applied for?

Binary logistic regressions with the possibility of applicants that answered “The Spark proposal was more so” fir the following five alternatives.

- 1) It was based on a risky idea with significant chance of failure
- 2) Urgency of funding: Research opportunities would get lost if waiting
- 3) Urgency of funding: Research talent would get lost if waiting
- 4) It was based on novel and/or unconventional ideas, perspectives or methods
- 5) I was confident that I would get positive results

	<i>Dependent variable:</i>				
	Question 3				
	(1)	(2)	(3)	(4)	(5)
Female	0.008 (0.170)	-0.226 (0.169)	0.044 (0.176)	0.284 (0.216)	0.022 (0.171)
Function: Leader	0.072 (0.219)	0.137 (0.212)	0.330 (0.226)	-0.214 (0.279)	-0.403* (0.215)
Function: Junior	-0.486** (0.204)	-0.049 (0.197)	0.115 (0.211)	-0.563** (0.262)	-0.265 (0.201)
Permanent Position	-0.377** (0.191)	-0.638*** (0.191)	-0.563*** (0.198)	-0.151 (0.241)	-0.222 (0.191)
Field: SSH	-0.223 (0.188)	-0.314* (0.189)	-0.156 (0.198)	0.107 (0.239)	-0.218 (0.189)
Field: STEM	0.160 (0.191)	-0.010 (0.182)	-0.040 (0.195)	0.008 (0.231)	-0.240 (0.191)
Approved Call	0.824*** (0.179)	-0.065 (0.171)	-0.079 (0.185)	0.750*** (0.234)	-0.902*** (0.178)
Call: March 2020	-0.267 (0.178)	-0.185 (0.177)	0.188 (0.189)	0.004 (0.221)	-0.242 (0.180)
Call: June 2020	-0.366 (0.237)	-0.024 (0.233)	0.067 (0.251)	0.027 (0.295)	0.086 (0.239)
Constant	0.818*** (0.252)	0.159 (0.243)	-0.467* (0.265)	1.656*** (0.316)	0.535** (0.248)
Observations	782	736	682	824	720
Log Likelihood	-484.637	-492.794	-445.825	-356.051	-472.287
Akaike Inf. Crit.	989.274	1,005.589	911.651	732.101	964.574

Note:

*p<0.1; **p<0.05; ***p<0.01

Question 4 The Spark project linked to the applicants other research projects

In what way was the Spark project you applied for linked to your other research? From a scale from 1-5.

OLS regression with the following as dependent variable in the ten regression models:

- 1) It was inspired by my previous research
- 2) It built directly on previous project(s) where I was the principal investigator
- 3) It built directly on previous project(s) where I was not the principal investigator
- 4) It was part of/closely linked to my overall research agenda
- 5) It was part of an overall project for which I/my group had obtained other research funding/grants
- 6) It built on a previous project proposal which was adapted to fit the Spark Call
- 7) It was a continuation of my postdoc project
- 8) I had (or would have) to acquire new competences for the Spark project
- 9) I had (or would have) to resign from (an)other project(s) to work on the Spark project
- 10) I had (or would have to) put other projects on hold to work on the Spark project
- 11) I (could have) work(ed) in parallel with the Spark project and (an)other project(s)

<i>Dependent variable:</i>					
	Question 4				
	(1)	(2)	(3)	(4)	(5)
Female	-0.009 (0.086)	0.010 (0.119)	-0.022 (0.110)	0.130 (0.092)	-0.162* (0.097)
Function: Leader	-0.302*** (0.109)	0.067 (0.148)	-0.201 (0.138)	-0.262** (0.117)	-0.006 (0.121)
Function: Junior	-0.224** (0.103)	-0.363** (0.141)	0.478*** (0.129)	-0.049 (0.110)	0.091 (0.114)
Permanent Position	-0.182* (0.096)	0.091 (0.130)	-0.013 (0.122)	-0.065 (0.103)	-0.012 (0.108)
Field: SSH	-0.168* (0.097)	-0.129 (0.132)	-0.351*** (0.122)	-0.036 (0.104)	-0.205* (0.108)
Field: STEM	-0.234** (0.097)	-0.361*** (0.135)	-0.079 (0.123)	-0.200* (0.104)	-0.244*** (0.109)
Approved Call	0.061 (0.089)	-0.181 (0.122)	0.017 (0.112)	0.104 (0.095)	-0.121 (0.099)
Call: March 2020	0.026 (0.092)	-0.158 (0.127)	0.010 (0.115)	0.004 (0.098)	-0.219** (0.102)
Call: June 2020	0.235* (0.122)	-0.060 (0.168)	0.226 (0.155)	0.104 (0.131)	-0.075 (0.139)
Constant	4.402*** (0.127)	3.157*** (0.175)	2.244*** (0.159)	3.810*** (0.136)	2.243*** (0.140)
Observations	836	771	786	831	798
R ²	0.027	0.039	0.059	0.020	0.018
Adjusted R ²	0.016	0.027	0.048	0.010	0.007

Note:

*p<0.1; **p<0.05; ***p<0.01

<i>Dependent variable:</i>						
	Question 4					
	(6)	(7)	(8)	(9)	(10)	(11)
Female	-0.059 (0.089)	0.072 (0.094)	-0.097 (0.104)	-0.103 (0.085)	-0.212** (0.094)	0.195** (0.094)
Function: Leader	-0.137 (0.111)	-0.242** (0.119)	-0.252* (0.131)	-0.188* (0.107)	-0.387*** (0.117)	0.163 (0.118)
Function: Junior	-0.182* (0.105)	0.416*** (0.111)	0.216* (0.124)	0.248** (0.102)	0.285** (0.112)	-0.488*** (0.111)
Permanent Position	-0.033 (0.098)	-0.380*** (0.105)	-0.181 (0.116)	-0.070 (0.095)	0.044 (0.105)	-0.059 (0.104)
Field: SSH	-0.060 (0.099)	-0.018 (0.105)	0.262** (0.116)	0.069 (0.095)	0.090 (0.105)	-0.113 (0.104)
Field: STEM	-0.225** (0.100)	-0.189* (0.105)	0.057 (0.117)	-0.078 (0.096)	-0.038 (0.105)	0.042 (0.105)
Approved Call	0.059 (0.091)	-0.069 (0.097)	0.238** (0.107)	0.012 (0.088)	0.135 (0.096)	-0.330*** (0.096)
Call: March 2020	-0.022 (0.094)	0.046 (0.100)	-0.015 (0.111)	-0.031 (0.091)	0.147 (0.100)	-0.160 (0.099)
Call: June 2020	0.099 (0.127)	0.086 (0.134)	-0.079 (0.149)	-0.041 (0.122)	-0.010 (0.133)	0.143 (0.133)
Constant	1.856*** (0.130)	1.803*** (0.137)	3.075*** (0.153)	1.639*** (0.125)	1.952*** (0.137)	4.027*** (0.136)
Observations	803	780	806	782	785	802
R ²	0.013	0.106	0.047	0.036	0.060	0.077
Adjusted R ²	0.001	0.096	0.036	0.024	0.049	0.067

Note:

* p<0.1; ** p<0.05; *** p<0.01

Question 5 Satisfaction

Considering your Spark application, to what extent did you find the following issues and processes satisfactory? From a scale from 1-5.

OLS regression with the following as dependent variable in the ten regression models:

- 1) The clarity of the terms and requirements for proposals: call documents, regulations and eligibility criteria
- 2) The support during the application process from the SNSF
- 3) The competence of the experts reviewing the proposals
- 4) The transparency regarding funding decisions
- 5) The clarity and completeness of the feedback to applicants
- 6) The time and efforts needed to prepare a proposal
- 7) The anonymised proposals/the double-blinded review process

	<i>Dependent variable:</i>						
	Question 5						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female	-0.018 (0.071)	-0.076 (0.085)	0.139 (0.092)	0.048 (0.098)	0.140 (0.098)	-0.067 (0.064)	0.133 (0.087)
Function: Leader	-0.221** (0.089)	-0.248** (0.110)	-0.232** (0.116)	-0.286** (0.123)	-0.198 (0.122)	0.027 (0.081)	-0.225** (0.109)
Function: Junior	0.031 (0.084)	0.053 (0.102)	0.121 (0.108)	0.235** (0.116)	0.238** (0.116)	0.001 (0.076)	0.049 (0.103)
Permanent Position	-0.042 (0.078)	0.001 (0.097)	-0.134 (0.103)	-0.011 (0.108)	0.061 (0.109)	-0.098 (0.072)	0.073 (0.096)
Field: SSH	-0.030 (0.079)	-0.135 (0.095)	-0.191* (0.102)	-0.087 (0.110)	-0.136 (0.109)	-0.002 (0.072)	0.069 (0.096)
Field: STEM	0.017 (0.079)	0.021 (0.095)	0.195* (0.104)	0.002 (0.109)	0.008 (0.109)	0.095 (0.072)	0.100 (0.098)
Approved Call	0.694*** (0.072)	0.876*** (0.087)	1.618*** (0.100)	1.064*** (0.101)	0.946*** (0.102)	0.668*** (0.066)	0.607*** (0.089)
Call: March 2020	0.155** (0.075)	0.136 (0.092)	0.138 (0.099)	0.065 (0.104)	0.043 (0.104)	0.127* (0.068)	0.010 (0.092)
Call: June 2020	-0.602*** (0.100)	-0.082 (0.118)	0.081 (0.131)	0.169 (0.139)	0.240* (0.139)	-0.0003 (0.091)	-0.542*** (0.123)
Constant	3.979*** (0.103)	3.719*** (0.126)	2.817*** (0.133)	2.954*** (0.143)	2.790*** (0.141)	3.717*** (0.093)	3.946*** (0.127)
Observations	826	688	664	775	764	825	806
R ²	0.190	0.169	0.336	0.162	0.131	0.134	0.109
Adjusted R ²	0.181	0.158	0.327	0.153	0.121	0.125	0.099

Note:

* p<0.1; ** p<0.05; *** p<0.01

Question 6 Applicants opinions of the reviewers

Based on the anonymous review reports you received (in case of a negative decision*), to what degree do you think the reviewers who assessed your Spark proposal? From a scale from 1-5.

OLS regression with the following as dependent variable in the ten regression models:

- 1) Were able to assess all the fields of research involved in the application?
- 2) Provided an open-minded/unbiased assessment of your application?
- 3) Provided a thorough assessment of your application?
- 4) Were able to guess your identity or identify your research environment from reading your project description?

	<i>Dependent variable:</i>			
	Question 6			
	(1)	(2)	(3)	(4)
Female	-0.058 (0.101)	0.075 (0.106)	0.064 (0.105)	0.075 (0.106)
Function: Leader	-0.121 (0.126)	-0.012 (0.133)	-0.079 (0.131)	-0.012 (0.133)
Function: Junior	-0.006 (0.123)	0.250* (0.127)	0.218* (0.126)	0.250* (0.127)
Permanent Position	-0.145 (0.114)	0.042 (0.119)	0.012 (0.118)	0.042 (0.119)
Field: SSH	-0.169 (0.113)	-0.048 (0.118)	-0.058 (0.117)	-0.048 (0.118)
Field: STEM	0.175 (0.114)	0.119 (0.119)	0.198* (0.118)	0.119 (0.119)
Approved Call	1.340*** (0.138)	1.546*** (0.143)	1.456*** (0.143)	1.546*** (0.143)
Call: March 2020	0.012 (0.109)	0.201* (0.114)	0.021 (0.113)	0.201* (0.114)
Call: June 2020	0.053 (0.136)	0.146 (0.142)	0.115 (0.140)	0.146 (0.142)
Constant	3.078*** (0.146)	2.690*** (0.152)	2.729*** (0.150)	2.690*** (0.152)
Observations	572	573	576	573
R ²	0.180	0.189	0.186	0.189
Adjusted R ²	0.166	0.176	0.174	0.176

Note:

*p<0.1; **p<0.05; ***p<0.01

Question 7 Did Spark provide appropriate policies?

In your opinion, to what degree did the Spark pilot provide the appropriate policies and review procedures to: From a scale from 1-5.

OLS regression with the following as dependent variable in the ten regression models:

- 1) Support well-founded and solid research?
- 2) Support original and groundbreaking research?
- 3) Support research ideas with limited basis in previous research (i.e. unconventional research)?
- 4) Support high-risk* research?
- 5) Tolerate the funding of research with negative or no results?
- 6) Facilitate interdisciplinary research?
- 7) Support research ideas with a need for rapid funding?
- 8) Promote the career of young investigators/researchers? i) Fill a gap in the Swiss research funding landscape?

	<i>Dependent variable:</i>								
	Question 7								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Female	-0.013 (0.085)	0.069 (0.083)	0.102 (0.085)	0.098 (0.089)	-0.011 (0.106)	0.065 (0.095)	0.081 (0.090)	0.151 (0.097)	-0.024 (0.075)
Function: Leader	-0.073 (0.108)	-0.020 (0.105)	-0.023 (0.109)	-0.002 (0.113)	-0.060 (0.136)	-0.005 (0.122)	0.229** (0.114)	0.078 (0.128)	-0.032 (0.095)
Function: Junior	0.070 (0.102)	0.061 (0.098)	-0.008 (0.102)	-0.012 (0.106)	-0.086 (0.129)	0.142 (0.114)	0.182* (0.107)	0.224* (0.115)	-0.023 (0.089)
Permanent Position	-0.150 (0.095)	-0.073 (0.092)	0.044 (0.096)	-0.088 (0.099)	-0.098 (0.119)	-0.110 (0.106)	-0.116 (0.100)	-0.034 (0.111)	-0.020 (0.083)
Field: SSH	0.260*** (0.095)	-0.026 (0.092)	0.018 (0.096)	0.018 (0.100)	0.105 (0.121)	0.264** (0.106)	0.133 (0.101)	-0.030 (0.109)	0.159* (0.084)
Field: STEM	0.076 (0.096)	-0.023 (0.093)	0.111 (0.095)	0.120 (0.097)	0.120 (0.117)	0.048 (0.107)	-0.037 (0.099)	0.025 (0.109)	0.099 (0.083)
Approved Call	0.607*** (0.088)	0.987*** (0.083)	1.035*** (0.086)	1.123*** (0.089)	1.338*** (0.109)	0.888*** (0.096)	0.893*** (0.090)	1.051*** (0.098)	0.631*** (0.076)
Call: March 2020	0.031 (0.092)	0.013 (0.089)	0.043 (0.091)	0.003 (0.094)	0.114 (0.116)	-0.025 (0.102)	0.041 (0.096)	0.225** (0.104)	0.033 (0.080)
Call: June 2020	-0.038 (0.120)	0.138 (0.115)	0.017 (0.121)	0.054 (0.124)	0.109 (0.145)	0.046 (0.134)	-0.119 (0.125)	0.191 (0.136)	0.051 (0.105)
Constant	3.390*** (0.129)	3.609*** (0.122)	3.512*** (0.126)	3.454*** (0.131)	3.040*** (0.160)	3.148*** (0.142)	3.305*** (0.129)	3.188*** (0.142)	4.089*** (0.110)
Observations	681	707	715	689	594	633	672	673	732
R ²	0.100	0.193	0.195	0.223	0.232	0.158	0.165	0.168	0.103
Adjusted R ²	0.088	0.183	0.184	0.212	0.220	0.146	0.154	0.157	0.092

Note:

*p<0.1; **p<0.05; ***p<0.01

Question 8 After the Spark call

Compared to grant proposals you have submitted to other* SNSF funding schemes, did you spend less, about the same or more time on preparing your Spark proposal?

Binary logistic regression with the probability of answering less time as dependent variable.

<i>Dependent variable:</i>	
Question 8	
Female	-0.280 (0.182)
Function: Leader	0.289 (0.216)
Function: Junior	-0.163 (0.214)
Permanent Position	0.318 (0.197)
Field: SSH	0.291 (0.201)
Field: STEM	0.237 (0.205)
Approved Call	0.277 (0.188)
Call: March 2020	-0.219 (0.194)
Call: June 2020	-0.322 (0.254)
Constant	0.182 (0.264)
Observations	636
Log Likelihood	-418.183
Akaike Inf. Crit.	856.365

Note: * p<0.1; ** p<0.05; *** p<0.01

Question 9 Spark compared to other SNSF funding schemes

Comparing the Spark pilot to other* SNSF funding schemes you are familiar with, was Spark poorer, about the same or better, concerning.

Binary logistic regression with the probability of answering “Better” with the following as dependent variables:

- 1) Reviewer competence
- 2) The transparency of the selection process
- 3) The impartiality and ethical standard of the selection process
- 4) Your general confidence in the selection process
- 5) Flexibility of use of funds
- 6) Seed funding to generate preliminary data
- 7) Possibility to explore and experiment with new ideas/openings in research
- 8) Grants available for young research talents
- 9) Adequacy for your career level
- 10) Adequacy for your funding needs

<i>Dependent variable:</i>										
Question 9										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Female	0.091 (0.328)	0.202 (0.264)	0.002 (0.257)	-0.057 (0.227)	-0.574** (0.223)	0.038 (0.224)	0.091 (0.225)	0.183 (0.215)	-0.311 (0.191)	-0.332* (0.190)
Function: Leader	-0.265 (0.387)	-0.644** (0.318)	-0.587* (0.303)	-0.601** (0.272)	0.402 (0.257)	0.196 (0.260)	0.133 (0.258)	0.214 (0.256)	-0.383* (0.228)	0.014 (0.228)
Function: Junior	-0.271 (0.388)	0.238 (0.311)	-0.337 (0.302)	0.155 (0.262)	0.399 (0.266)	0.064 (0.264)	0.369 (0.268)	0.058 (0.253)	0.550** (0.221)	0.589*** (0.221)
Permanent Position	-0.316 (0.351)	0.234 (0.282)	-0.202 (0.274)	0.128 (0.244)	0.187 (0.234)	0.136 (0.240)	0.096 (0.239)	-0.105 (0.232)	-0.422** (0.205)	-0.175 (0.205)
Field: SSH	-0.206 (0.366)	-0.594* (0.307)	-0.694** (0.295)	-0.149 (0.253)	0.158 (0.239)	0.083 (0.246)	0.353 (0.248)	0.192 (0.236)	-0.169 (0.212)	0.185 (0.209)
Field: STEM	-0.020 (0.356)	0.092 (0.277)	-0.005 (0.272)	-0.257 (0.246)	-0.359 (0.243)	0.128 (0.254)	0.136 (0.255)	0.022 (0.243)	-0.436** (0.216)	-0.109 (0.214)
Approved Call	2.036*** (0.334)	1.900*** (0.277)	1.575*** (0.260)	1.834*** (0.225)	0.843*** (0.223)	0.991*** (0.236)	1.986*** (0.284)	1.118*** (0.234)	0.489** (0.195)	0.339* (0.191)
Call: March 2020	0.050 (0.364)	0.785*** (0.293)	0.513* (0.280)	0.241 (0.239)	0.229 (0.238)	-0.014 (0.239)	0.410* (0.237)	0.232 (0.225)	0.082 (0.205)	-0.015 (0.203)
Call: June 2020	0.062 (0.494)	0.207 (0.411)	0.415 (0.367)	-0.379 (0.355)	0.381 (0.311)	-0.230 (0.297)	0.344 (0.300)	0.576* (0.311)	0.215 (0.273)	0.215 (0.268)
Constant	-2.299*** (0.478)	-2.473*** (0.407)	-1.411*** (0.374)	-1.648*** (0.334)	-1.161*** (0.344)	0.261 (0.330)	-0.009 (0.324)	0.142 (0.308)	0.070 (0.279)	-0.653** (0.281)
Observations	446	529	460	588	474	483	596	538	579	594
Log Likelihood	-156.110	-228.704	-233.940	-297.384	-300.411	-286.300	-293.199	-312.205	-377.768	-388.496
Akaike Inf. Crit.	332.220	477.408	487.879	614.768	620.822	592.601	606.398	644.410	775.536	796.993

Note:

* p<0.1; ** p<0.05; *** p<0.01

Question 10 Do Spark fit the needs for unconventional research?

To what extent do the terms of the Spark pilot fit the needs you see for rapid funding of unconventional research in Switzerland concerning. From a scale from 1-5.

OLS regression with the following as dependent variable in the ten regression models:

- 1) Speed of the application and selection process
- 2) Amount of funding
- 3) Project duration
- 4) Categories of researchers eligible for grants
- 5) Grants available for young research talents
- 6) Types of institutions eligible for hosting the projects

	<i>Dependent variable:</i>					
	Question 10					
	(1)	(2)	(3)	(4)	(5)	(6)
Female	0.043 (0.078)	0.045 (0.078)	0.008 (0.083)	0.039 (0.075)	-0.049 (0.077)	0.038 (0.078)
Function: Leader	0.154 (0.099)	0.025 (0.099)	0.069 (0.105)	-0.127 (0.096)	-0.113 (0.100)	-0.156 (0.100)
Function: Junior	0.135 (0.093)	0.154* (0.093)	0.117 (0.098)	0.074 (0.089)	0.095 (0.092)	0.114 (0.094)
Permanent Position	0.121 (0.087)	-0.129 (0.088)	0.016 (0.092)	-0.029 (0.084)	-0.184** (0.087)	-0.024 (0.088)
Field: SSH	0.055 (0.087)	0.086 (0.087)	0.052 (0.092)	0.089 (0.083)	0.035 (0.086)	0.048 (0.089)
Field: STEM	0.050 (0.088)	-0.020 (0.088)	0.103 (0.093)	0.086 (0.084)	-0.113 (0.087)	0.035 (0.087)
Approved Call	0.610*** (0.080)	0.321*** (0.080)	-0.020 (0.085)	0.508*** (0.076)	0.540*** (0.079)	0.385*** (0.081)
Call: March 2020	-0.118 (0.083)	-0.161* (0.083)	-0.121 (0.088)	0.049 (0.080)	0.128 (0.082)	-0.010 (0.084)
Call: June 2020	-0.334*** (0.110)	-0.059 (0.111)	-0.047 (0.117)	0.111 (0.106)	0.162 (0.109)	-0.140 (0.110)
Constant	3.720*** (0.115)	3.522*** (0.115)	3.429*** (0.122)	3.995*** (0.110)	4.105*** (0.114)	4.065*** (0.117)
Observations	794	790	793	741	724	642
R ²	0.113	0.049	0.006	0.075	0.090	0.063
Adjusted R ²	0.103	0.038	-0.006	0.063	0.078	0.050

Note: * p<0.1; ** p<0.05; *** p<0.01

Question 11 Preferences of future Spark instruments

What kind of processes for selecting proposals - after initial review by the individual experts - would you prefer for a future Spark instrument?

Binary logistic regression with the probability of answering the following as dependent variables.

- 1) Proposals selected based on the aggregated individual review scores, giving priority to proposals with a higher score on originality and unconventionality (i.e. as in the 2020 Spark call for proposals).
- 2) Proposals ranked by a review panel of experts based outside Switzerland (expert panel discussions).
- 3) Random selection among all proposals assessed fundable by the individual experts.

	<i>Dependent variable:</i>		
	Question 11		
	(1)	(2)	(3)
Female	-0.002 (0.037)	0.036 (0.034)	-0.036 (0.028)
Function: Leader	-0.025 (0.047)	0.078* (0.043)	-0.028 (0.036)
Function: Junior	0.038 (0.045)	0.025 (0.041)	-0.024 (0.034)
Permanent Position	0.031 (0.042)	0.031 (0.038)	-0.048 (0.032)
Field: SSH	-0.025 (0.041)	0.049 (0.038)	-0.007 (0.032)
Field: STEM	0.013 (0.042)	0.007 (0.038)	-0.004 (0.032)
Approved Call	0.393*** (0.038)	-0.192*** (0.035)	-0.123*** (0.029)
Call: March 2020	-0.007 (0.040)	-0.011 (0.036)	0.034 (0.030)
Call: June 2020	0.011 (0.052)	0.052 (0.048)	-0.054 (0.040)
Constant	0.352*** (0.055)	0.248*** (0.051)	0.243*** (0.042)
Observations	752	752	752
R ²	0.149	0.063	0.040
Adjusted R ²	0.139	0.051	0.028

Note: *p<0.1; **p<0.05; ***p<0.01

Appendix 6 Results from Spark reviewer survey

Spark reviewer survey

NIFU

September 2021

Overview results

Descriptive statistics

Variable	Count	Percentage	Total
Gender: Female	207	29	711
Gender: Male	504	71	711
Age: Below 40	98	14	709
Age: 40-49	237	33	709
Age: 50-59	185	26	709
Age: 60 or above	189	27	709
Position: Assistant professor/similar	93	13	711
Position: Associate professor/similar	164	23	711
Position: Full professor/similar	380	53	711
Position: Lead Researcher/Head of Research/similar	31	4	711
Position: Other	43	6	711
Review year: 2019	176	25	711
Review year: 2020	368	52	711
Review year: 2019 and 2020	167	23	711
Country: USA, Canada and Australia	294	41	709
Country: United Kingdom	135	19	709
Country: Europe	193	27	709
Country: Other	87	12	709
Research field: Natural sciences and agriculture	273	39	704
Research field: Engineering and technology	81	12	704
Research field: Medical sciences	96	14	704
Research field: Social sciences	169	24	704
Research field: Humanities	59	8	704
Research field: Other	26	4	704
Grant proposals reviewed for the SNSF: 0	148	21	705
Grant proposals reviewed for the SNSF: 1-5	472	67	705
Grant proposals reviewed for the SNSF: 6-20	59	8	705
Grant proposals reviewed for the SNSF: Above 20	26	4	705
Grant proposals reviewed for other funding agencies: 0	29	4	681
Grant proposals reviewed for other funding agencies: 1-5	207	30	681
Grant proposals reviewed for other funding agencies: 6-20	180	26	681
Grant proposals reviewed for other funding agencies: Above 20	265	39	681

For an overview of respondents by country see the page 8 of this document.

Your experience with the Spark review criteria and process

6. Adequacy of the review criteria. The Spark review form asked for assessment on the following four criteria. For each of them, please indicate whether you think it is an adequate criterion when assessing proposals.

Question 6	1 = Not at all	2	3	4	5 = To a great extent	Cannot say	Total	Freq
a) Originality/Novelty of the proposed project	0	1	4	26	66	3	100	689
b) Unconventionality of the idea	2	9	25	38	23	3	100	688
c) Scientific quality of the proposed project	0	1	4	18	75	3	100	688
d) Potential for significant impacts	0	3	13	36	46	3	100	687

8. Comprehensibility of criteria and ability to assess the Spark proposals. Please indicate to what extent you agree with the statements below.

Question 8	5 = To a great extent/in all cases	Freq
a) The review criteria were clear and easy to understand	53	688
b) The review guidelines provided by the SNSF were clear and easy to understand	57	689
c) The proposal(s) I reviewed was/were close to my field of expertise	48	688
d) I was able to assess the 'Originality/Novelty' of the proposed project(s) assigned to me	55	686
e) I was able to assess the 'Unconventionality' of the proposed project(s) assigned to me	37	688
f) I was able to assess the 'Scientific quality' of the projects assigned to me	63	684
g) I was able to assess the 'Potential for significant impacts' of the proposed project(s) assigned to me	42	685

Question 8	1 = Not at all/in no cases	2	3	4	5 = To a great extent/in all cases	Cannot remember/Cannot say	Total	Freq
a) Review criteria	0	0	3	36	53	8	100	688
b) Review guidelines	0	0	3	31	57	9	100	689
c) Closeness to field of expertise	0	2	9	38	48	4	100	688
d) Assessment of 'Originality/Novelty'	0	1	5	34	55	4	100	686
e) Assessment of 'Unconventionality'	1	5	14	36	37	7	100	688
f) Assessment of 'Scientific quality'	0	2	3	28	63	4	100	684
g) Assessment of 'Potential for significant impacts'	1	4	11	37	42	5	100	685

Difficulty of review and time needed compared to reviewing other grant proposals

10. Compared to grant proposals you have reviewed for other funding schemes, was/were the Spark proposal(s) less, about the same or more difficult to review?

Question 10	Less difficult	About the same	More difficult	Cannot remember/Cannot say	Not applicable, I have not reviewed other grant proposals	Total	Freq
Review difficulty	35	55	3	3	3	100	684

11. Compared to grant proposals you have reviewed for other funding schemes, did you spend less, about the same or more time (on average) on reviewing the Spark proposal(s)?

Question 11	Less time	About the same time	More time	Cannot remember/Cannot say	Not applicable, I have not reviewed other grant proposals	Total	Freq
Review time	29	60	4	4	4	100	683

Your overall assessment of the Spark Pilot

13. Compared to other grant proposals you have reviewed, what characterised the Spark project(s) you reviewed? The spark proposal(s):

Question 13	Was/were more so	Freq
a) The project ideas were well prepared and clearly described	13	674
b) Urgency of funding: Research opportunities would get lost if rapid funding was not provided	17	668
c) The project description(s) contained unconventional research ideas, perspectives and/or methods	32	669
d) The research question were clearly linked to an existing line of research	12	669
e) The proposed research involved multiple disciplines of research	15	671
f) The projects aimed at testing high risk/high impact research ideas*	30	670

Question 13	Was/were less so	Did not differ substantially	Was/were more so	Cannot remember / Cannot say	Not applicable**	Total	Freq
a) Project ideas	14	59	13	10	3	100	674
b) Loss of research opportunities	11	45	17	22	6	100	668
c) Unconventional research ideas/perspectives/methods	10	44	32	10	4	100	669
d) Linked to existing line of research	14	60	12	11	4	100	669
e) Involved multiple disciplines	14	51	15	16	4	100	671
f) High risk/high impact ideas*	11	43	30	12	4	100	670

*I.e research ideas with a high probability of failure to get any significant results, but with a possible high impact on future research if successful.

**Not applicable, I have not reviewed proposals for other funding schemes.

14. In your opinion, to what degree did the Spark pilot provide the appropriate procedures to:

Question 14	1 = Not at all	2	3	4	5 = To a great extent	Cannot remember / Cannot say	Total	Freq
a) Support original and ground-breaking research?	1	2	11	41	34	12	100	673
b) Support high-risk research?	1	3	17	35	26	17	100	672
c) Facilitate interdisciplinary research?	1	4	23	35	19	19	100	668
d) Support ideas with limited basis in previous research?	1	5	21	36	22	16	100	670
e) Support research that needs to be implemented fast?	2	5	22	30	17	23	100	669

*I.e research ideas with a high probability of failure to get any significant results, but with a possible high impact on future research if successful.

15. Overall, do you think the blinding of applicants' identities was conducive to supporting unconventional research?

Question 15	Yes	No	The blinding made little difference	It was not really blinded - I could guess the identity of the applicant(s)	Cannot remember / Cannot say	Total	Freq
Blinding of applicants	46	8	31	7	8	100	669

Country	Count	Percentage
United States	214	30.2
United Kingdom	135	19.0
Germany	61	8.6
Australia	46	6.5
Canada	34	4.8
Spain	31	4.4
France	24	3.4
Netherlands	23	3.2
Italy	22	3.1
Sweden	17	2.4
Austria	15	2.1
Denmark	15	2.1
Finland	7	1.0
Norway	7	1.0
Belgium	6	0.8
Israel	5	0.7
Japan	5	0.7
South Africa	5	0.7
Estonia	3	0.4
Singapore	3	0.4
China	2	0.3
Cyprus	2	0.3
Hong Kong	2	0.3
Hungary	2	0.3
Ireland	2	0.3
New Zealand	2	0.3
Poland	2	0.3
Portugal	2	0.3
Argentina	1	0.1
Czech Republic	1	0.1
Greece	1	0.1
India	1	0.1
Latvia	1	0.1
Lithuania	1	0.1
Luxembourg	1	0.1
Macao	1	0.1
Malaysia	1	0.1
Pakistan	1	0.1
Paraguay	1	0.1
Romania	1	0.1
Serbia	1	0.1
Taiwan	1	0.1
Uganda	1	0.1
Total	709	100.0

Spark reviewer survey – Replies by field and year

Your experience with the Spark review criteria and process

6. Adequacy of the review criteria. The Spark review form asked for assessment on the following four criteria. For each of them, please indicate whether you think it is an adequate criterion when assessing proposals.

Scale: 1 = Not at all - 5 = To a great extent.

Table 1: Mean by research field.

Question 6	Statistic	Nat sci & agric	Eng & tech	Med sci	Soc sci	Hum
a) Originality/Novelty of the proposed project	Mean	4,6	4,6	4,7	4,6	4,6
	N	262	77	86	162	56
b) Unconventionality of the idea	Mean	3,8	3,9	3,8	3,6	3,9
	N	261	77	86	161	55
c) Scientific quality of the proposed project	Mean	4,7	4,6	4,7	4,8	4,6
	N	261	77	87	162	55
d) Potential for significant impacts	Mean	4,2	4,3	4,3	4,4	4,2
	N	260	76	87	162	55

Table 2: Mean by review year.

Question 6	Statistic	2019	2020	2019 & 2020
a) Originality/Novelty of the proposed project	Mean	4,6	4,6	4,6
	N	165	342	164
b) Unconventionality of the idea	Mean	3,7	3,7	3,9
	N	162	341	163
c) Scientific quality of the proposed project	Mean	4,7	4,7	4,7
	N	164	342	163
d) Potential for significant impacts	Mean	4,3	4,2	4,3
	N	164	341	162

8. Comprehensibility of criteria and ability to assess the Spark proposals. Please indicate to what extent you agree with the statements below.

Scale: 1 = Not at all/in no cases - 5 = To a great extent/in all cases.

Table 3: Mean by research field.

Question 8	Statistic	Nat sci & agric	Eng & tech	Med sci	Soc sci	Hum
a) The review criteria were clear and easy to understand	Mean	4,5	4,6	4,6	4,5	4,6
	N	245	72	79	150	57
b) The review guidelines provided by the SNSF were clear and easy to understand	Mean	4,6	4,6	4,6	4,6	4,6
	N	243	70	80	149	55
c) The proposal(s) I reviewed was/were close to my field of expertise	Mean	4,4	4,3	4,4	4,3	4,4
	N	257	75	86	156	57
d) I was able to assess the 'Originality/Novelty of the proposed project(s) assigned to me	Mean	4,5	4,6	4,5	4,5	4,6
	N	254	75	85	156	56
e) I was able to assess the 'Unconventionality' of the proposed project(s) assigned to me	Mean	4,1	4,2	4,1	4	4,2
	N	252	73	83	152	56
f) I was able to assess the 'Scientific quality' of the projects assigned to me	Mean	4,6	4,6	4,7	4,6	4,4
	N	254	75	86	157	53
g) I was able to assess the 'Potential for significant impacts' of the proposed project(s) assigned to me	Mean	4,1	4,3	4,4	4,3	4,2
	N	251	75	86	155	55

Table 4: Mean by review year.

Question 8	Statistic	2019	2020	2019 & 2020
a) The review criteria were clear and easy to understand	Mean	4,5	4,5	4,6
	N	158	313	160
b) The review guidelines provided by the SNSF were clear and easy to understand	Mean	4,6	4,6	4,6
	N	156	310	159
c) The proposal(s) I reviewed was/were close to my field of expertise	Mean	4,4	4,5	4,1
	N	164	332	164
d) I was able to assess the 'Originality/Novelty of the proposed project(s) assigned to me	Mean	4,5	4,6	4,3
	N	162	329	164
e) I was able to assess the 'Unconventionality' of the proposed project(s) assigned to me	Mean	4,1	4,2	4
	N	157	321	163
f) I was able to assess the 'Scientific quality' of the projects assigned to me	Mean	4,6	4,6	4,5
	N	159	330	164
g) I was able to assess the 'Potential for significant impacts' of the proposed project(s) assigned to me	Mean	4,2	4,3	4,1
	N	160	327	164

Difficulty of review and time needed compared to reviewing other grant proposals

10. Compared to grant proposals you have reviewed for other funding schemes, was/were the Spark proposal(s) less, about the same or more difficult to review?

Scale: 1 = Less difficult - 3 = More difficult.

Table 5: Mean by research field.

Question 10	Statistic	Nat sci & agric	Eng & tech	Med sci	Soc sci	Hum
Review difficulty	Mean	1,6	1,6	1,7	1,7	1,9
	N	251	74	86	145	53

Table 6: Mean by review year.

Question 10	Statistic	2019	2020	2019 & 2020
Review difficulty	Mean	1,8	1,6	1,6
	N	155	322	161

11. Compared to grant proposals you have reviewed for other funding schemes, did you spend less, about the same or more time (on average) on reviewing the Spark proposal(s)?

Scale: 1 = Less time - 3 = More time.

Table 7: Mean by research field.

Question 11	Statistic	Nat sci & agric	Eng & tech	Med sci	Soc sci	Hum
Review time	Mean	1,7	1,7	1,8	1,7	1,9
	N	251	73	86	145	51

Table 8: Mean by review year.

Question 11	Statistic	2019	2020	2019 & 2020
Review time	Mean	1,9	1,7	1,7
	N	153	322	160

Your overall assessment of the Spark Pilot

13. Compared to other grant proposals you have reviewed, what characterised the Spark project(s) you reviewed? The spark proposal(s):

Scale: 1 = The Spark proposal(s) was/where less so - 3 = The Spark proposal(s) was/were more so.

Table 10: Mean by research field.

Question 13	Statistic	Nat sci & agric	Eng & tech	Med sci	Soc sci	Hum
a) Project ideas	Mean	2	2,1	1,9	1,9	1,9
	N	228	69	78	133	50
b) loss of research opportunities	Mean	2,1	2,1	2	2	2,2
	N	198	59	60	107	42
c) Unconventional research/perspectives/methods	Mean	2,3	2,2	2,3	2,3	2,1
	N	226	67	77	130	52
d) linked to existing line of research	Mean	2	2,1	2	1,9	1,9
	N	218	69	77	133	47
e) Involved multiple disciplines	Mean	2	2	2	2,1	2,2
	N	215	63	65	116	49
f) High risk/high impact ideas*	Mean	2,3	2,3	2,2	2,2	2,1
	N	220	71	75	126	45

*I.e research ideas with a high probability of failure to get any significant results, but with a possible high impact on future research if successful.

Table 11: Mean by review year.

Question 13	Statistic	2019	2020	2019 & 2020
a) Project ideas	Mean	1,9	2	2,1
	N	143	293	150
b) loss of research opportunities	Mean	2,1	2	2,1
	N	107	246	131
c) Unconventional research/perspectives/methods	Mean	2,1	2,3	2,4
	N	139	289	150
d) linked to existing line of research	Mean	2	2	1,9
	N	138	286	147
e) Involved multiple disciplines	Mean	2	2	2
	N	130	263	139
f) High risk/high impact ideas*	Mean	2,1	2,2	2,3
	N	127	283	150

*I.e research ideas with a high probability of failure to get any significant results, but with a possible high impact on future research if successful.

14. In your opinion, to what degree did the Spark pilot provide the appropriate procedures to:

Scale: 1 = Not at all - 5 = To a great extent.

Table 12: Mean by research field.

Question 14	Statistic	Nat sci & agric	Eng & tech	Med sci	Soc sci	Hum
a) Support original and ground-breaking research?	Mean	4,2	4,1	4,2	4,2	4,4
	N	233	68	74	138	52
b) Support high-risk research?	Mean	4	4	4,1	4	3,9
	N	229	70	69	123	43
c) Facilitate interdisciplinary research?	Mean	3,7	3,9	3,8	3,8	4,1
	N	212	62	69	125	52
d) Support ideas with limited basis in previous research?	Mean	3,9	4	3,8	3,9	4,1
	N	224	64	73	126	50
e) Support research that needs to be implemented fast?	Mean	3,8	3,7	3,7	3,7	3,8
	N	208	60	70	109	44

Table 13: Mean by review year.

Question 14	Statistic	2019	2020	2019 & 2020
a) Support original and ground-breaking research?	Mean	4,1	4,2	4,2
	N	144	291	158
b) Support high-risk research?	Mean	3,8	4	4,1
	N	144	291	158
c) Facilitate interdisciplinary research?	Mean	3,7	3,9	3,7
	N	144	291	158
d) Support ideas with limited basis in previous research?	Mean	3,7	3,9	4
	N	130	282	150
e) Support research that needs to be implemented fast?	Mean	3,7	3,7	3,8
	N	119	257	137

15. Overall, do you think the blinding of applicants' identities was conducive to supporting unconventional research?

Table 14: Percentage by research field.

Question 15	Nat sci & agric	Eng & tech	Med sci	Soc sci	Hum
Yes	42 % 99	49 % 33	44 % 36	58 % 85	69 % 37
No	11 % 27	10 % 7	10 % 8	6 % 9	4 % 2
The blinding made little difference	36 % 84	32 % 22	42 % 34	30 % 44	26 % 14
It was not really blinded*	11 % 84	9 % 6	4 % 3	5 % 8	2 % 1
Total	100% (236)	100% (68)	100% (81)	100% (146)	100% (54)

Table 15: Percentage by review year.

Question 15	2019	2020	2019 & 2020
Yes	54 % 80	51 % 161	43 % 66
No	8 % 12	9 % 28	9 % 14
The blinding made little difference	32 % 47	30 % 94	43 % 66
It was not really blinded*	6 % 9	10 % 30	5 % 7
Total	100% (148)	100% (313)	100% (153)

*It was not really blinded - I could guess the identity of the applicant(s).

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