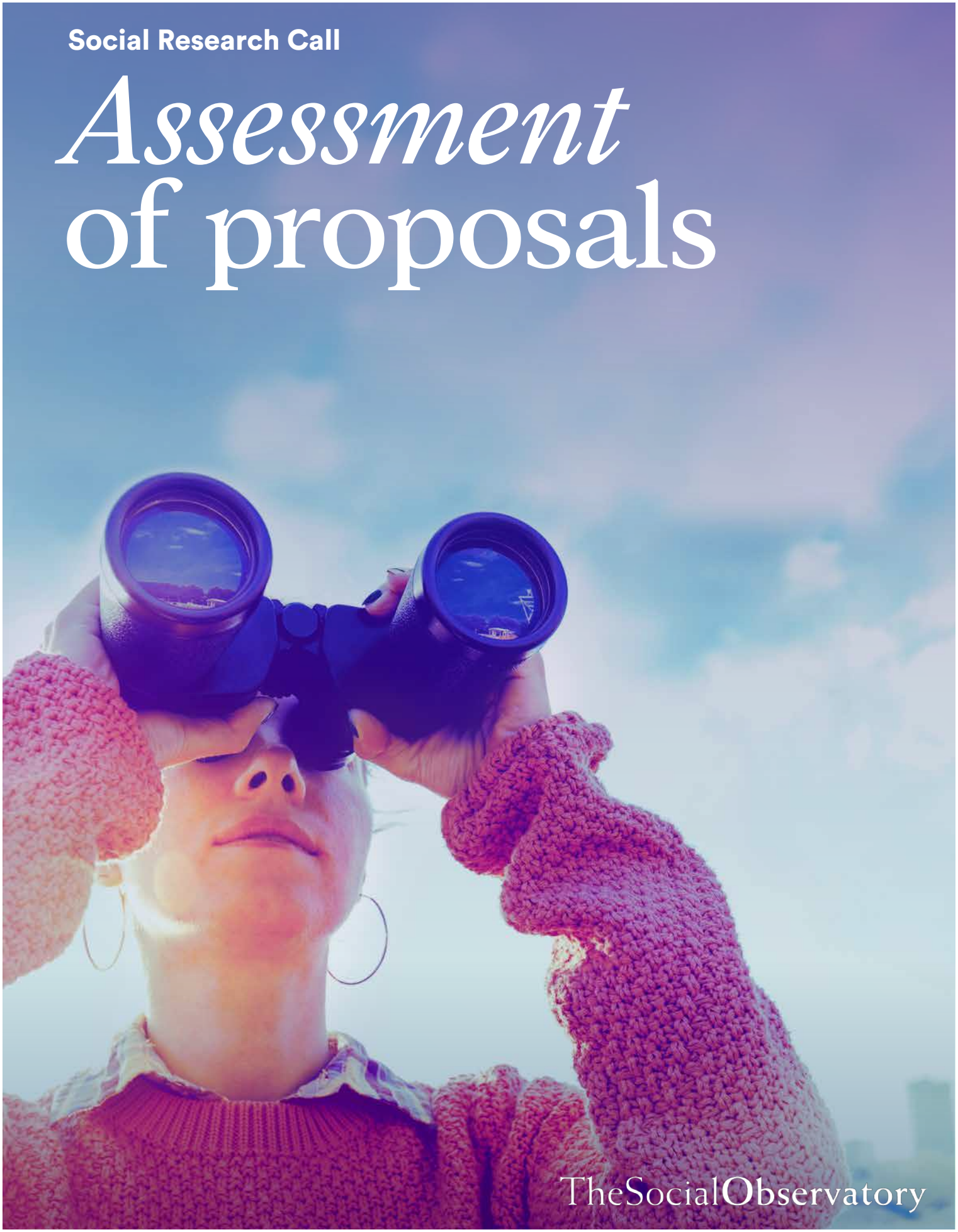
"la Caixa" Foundation

2022

Social Research Call

Assessment of proposals



TheSocialObservatory

Foreword

"la Caixa" Foundation launches an open and competitive call to fund excellent, innovative and socially-oriented research projects. Proposals must be based on robust quantitative methodologies and provide new, reliable knowledge to broaden our understanding of major challenges in today's society.

An indispensable component of good funding practice is to implement a transparent and professionally managed selection process. With this in mind and in order to ensure the identification of the best proposals for funding, "la Caixa" Foundation has established independent evaluation procedures conducted by external experts through a multi-phase evaluation system.

Key aspects:

1. A procedure to **lower the researcher's burden** during application has been set up with the aim of attracting diverse and unconventional proposals. Therefore, **only a very short proposal will be required as a starting point to enter into the selection process**. As the proposals advance through subsequent evaluation phases, applicants will be required to elaborate further on the content of their projects in a full proposal.

2. A straightforward evaluation system has been designed to allow evaluators to assess proposals easily. The A-B-C **scoring scheme allows evaluators to distinguish between proposals in a straightforward way**.

3. **A fair and responsible review process** that relies on scholars (peer-review) and non-academic practitioners (stakeholder-review) in order to **allow for different evaluation approaches for specific criteria**.

4. Furthermore, in order to promote diversity and keep the value of the research ideas at the core of the evaluation, an innovative **triple-blind multi-phase selection process** has been designed to ensure biases related to gender and other factors play no role. The process is set up so that I) applicants remain anonymous until the final stage of the selection process, II) research proposals and researcher profiles are reviewed separately, III) researchers are assessed only after the evaluation of the proposal is complete and IV) the evaluation of the researcher is reduced to a binary judgement as to whether or not they have the academic expertise and social and public sector expertise, and resources to implement the proposed research.

In this way, the application and selection process are expected to attract and reward the most innovative projects that will bring robust and valuable knowledge to the corresponding social research fields.

Principles of good governance

The following principles are the cornerstone of the Social Research Call selection process. These are the governing principles of the whole evaluation process and ensure the fair selection of the best proposals:

» **TRANSPARENCY.** Applicants, evaluators and the general public have access to the basic principles that govern the process of evaluating and selecting proposals, and the procedures followed, which are available on the "la Caixa" Foundation's website. In addition, applicants receive timely information on the status of the proposal at different stages of the process and, when appropriate, feedback on the outcome of the evaluation of their proposal.

» **EQUITY.** Proposals are evaluated based only on the value they have accredited in their application documents in relation to the evaluation criteria explicitly defined for each stage of the process; no other factors are taken into consideration. All proposals will be evaluated against the same criteria at each evaluation phase. Furthermore, the assignment of proposals to evaluators will be conducted using a randomization algorithm.

» **EFFICIENCY.** "la Caixa" Foundation grants are characterized by the thoroughness with which the proposal assessment process is conducted and the rigor in complying with the stipulated procedures. Punctuality in meeting deadlines, which are published, and hence known by all applicants, is of the utmost importance. The system has been designed in such a way that reviewers can have sufficient time to perform their assessment to a high standard.

» **QUALITY.** This call welcomes proposals of every disciplinary nature within social sciences and humanities. Proposals will be evaluated taking into account both scientific soundness and the relevance of topics and approaches. Reviewers will form multidisciplinary panels of independent experts from a wide range of countries. Furthermore, with the aim of promoting social research that bridges science and society, stakeholders (mainly practitioners from NGOs and public sector) from outside academia will be incorporated at certain stages of the evaluation process.

» **INDEPENDENCE.** The evaluation process must ensure the impartiality of the selection of proposals. Therefore, each evaluator must undertake his or her work independently, safeguarding no other condition than the actual examination of the content of the proposal. For further transparency and to ensure that total independence of the evaluator will be preserved throughout the process. Only once the grants have been awarded will the complete list of evaluators (by full name and institution) who have intervened in the evaluation phases be published on "la Caixa" Foundation website.

» **UNBIASED.** A triple-blind review system will be applied until the final interviews: (1) Reviewers will not know the identity of applicants: both short and full proposals will be anonymous, and will not contain any information by which the identity, gender or age of the principal investigator, the research group or the institution leading the project can be recognized, (2) applicants will not know the identity of the reviewers until after the end of the evaluation process and (3) the reviewers will not know the identity of the rest of the reviewers evaluating the proposals, with the exception of the selection panel interviews.

Overview

The Programme Office will check the eligibility of all submitted applications according to the requirements specified in the **rules for participation**. All eligible proposals will then be suitable for external evaluation through the process described below.

In order to optimize the workload of applicants and evaluators, the submission and evaluation of proposals is structured incrementally in a **two-stage procedure:**

PHASE 1

Eligible applicants linked to a host organization **with a short proposal submitted prior to the corresponding deadline** move on to Phase 1.

Phase 1 is composed of two consecutive evaluation stages:

PHASE 1.1: Remote peer-review

PHASE 1.2: Remote stakeholder-review

Successful proposals resulting from this evaluation phase will be invited to proceed to the second stage.

PHASE 2

Only applicants of selected short proposals are invited to submit a **full proposal** of the same project and to demonstrate their **research expertise** and **public and social sector expertise**. These proposals enter into Phase 2.

Phase 2 is composed by two consecutive evaluation stages:

PHASE 2.1: Remote peer-review

PHASE 2.2: Selection panel interviews

Successful proposals resulting from this evaluation phase will be awarded the grant.

Blind | Interviews

For more information on the documentation of each stage, visit **the Social Observatory of "la Caixa" Foundation's website**

Evaluation criteria

The evaluation criteria considered in this call only concern the quality of the research proposal. For each evaluation phase, a certain set of criteria is considered, according to the reviewers' background and expertise. Reviewers will assess proposals considering the set of criteria for each phase as a whole:

Novelty:

- How novel are the concepts and approach presented in the proposal?
- How groundbreaking is the proposed management of quantitative data to address the question?
- Considering the subject of the research, does it avoid the most travelled scientific roads?
- How counterintuitive is the hypothesis proposed?

Scientific soundness:

- How clear and consistent is the proposal?
- Are the objectives clearly defined and attainable?
- Does the project clearly go beyond existing knowledge and make a significant contribution to research?
- How robust are the concepts, theoretical framework and the methodologies?

Social relevance:

- Does the proposal tackle a topic of concern for society that is relevant to the Spanish and/or Portuguese context?
- To what extent is the proposed approach adequate to better understand and tackle the problem addressed?
- Can the expected results make a significant contribution to current social debates?

Feasibility:

- Is the work plan clearly stated, justifying timescales and resources adequately?
- How detailed is the data management and/or data exploitation plan explained?
- Are the limitations of the study and potential contingencies contemplated?
- Does the budget clearly explain how the grant money will provide the necessary resources and services for this project?

Public engagement:

- Does the project aim to incorporate knowledge from relevant non-academic stakeholders throughout the project (including experts from outside of academia and/or those affected by the issue you are studying)?
- In addition to dissemination initiatives, does the project determine real applications of the research results?

PHASE 1.1

PHASE 1.2

PHASES 2.1 and 2.2

Assessment of proposals

The whole assessment is based on an independent and competitive selection process performed by external experts and based on a mixed rating system. For each evaluation stage, the procedure encompasses:

- an initial A-B-C scoring scheme that clearly indicates to what extent proposals successfully meet the evaluation criteria. 'C's are only assigned in phase 1.1 of the evaluation, as an indicator of insufficient quality.
- each evaluator then ranks the proposals that they have scored as an 'A', in order to allow the best proposals to proceed to the next phase of the evaluation.

Detailed characteristics of each evaluation phase are described in the sections below, according to:

1. System of assignment
2. Scoring scheme
3. Evaluation criteria
4. Ranking of successful proposals

PHASE 1:
Evaluation of short proposals

Phase 1.1 - Remote peer-review

1. Each eligible short proposal is **assigned randomly** to and **evaluated by 5 independent experts**, selected from a pool of renowned **international scholars** from different disciplines in social sciences and humanities.

2. The assessment is done remotely according to the following scoring scheme:

   - **Score 'A':** The proposal meets the evaluation criteria and is of a high standard.
   - **Score 'B':** The proposal meets the evaluation criteria to a certain extent but is not among the top 15 projects.
   - **Score 'C':** The proposal does not meet the criteria adequately.

   Subsequently, **'A' scored proposals are ranked** according to the extent to which they meet the corresponding criteria.

   ⚠ **IMPORTANT:** *Based on a mathematical model (see Annexes),* ***15 proposals must be scored as 'A' and ranked*** *to guarantee that a sufficient number of proposals pass on to the next stage. All proposals scored with an 'A' must be ranked. Proposals scored with 'B' and 'C' are not ranked.*

3. At this stage of the evaluation process, proposals are assessed based on their '**novelty**' and '**scientific soundness**'.

   ⚠ **IMPORTANT:** *In addition to low-quality proposals, proposals that do not meet the following criteria must be* ***scored as 'C' automatically:***
   · Proposals not addressing current or emerging social challenges ***relevant for Spain and/or Portugal.***
   · Proposals not based on ***quantitative data.***

   Reviewers must contact the Programme Office if proposals contain information by which **the identity of the applicant**, research group or the institution leading the project can be recognized. These proposals will be declared ineligible and excluded from the selection process.

   ⚠ **IMPORTANT:** *Applicants whose proposal obtains a 'C' score from 3 or more of the 5 evaluators and no 'A' scores in phase 1.1 will not be considered for phase 1.2 and will not be able to apply for the next edition of the Social Research Call.*

4. Based on the scoring described above, a final ranking of proposals is generated. A maximum of **200 proposals** are selected to pass to the following stage. For all stages, the Programme Office reserves the right not to pre-select the specified number of applications if a sufficient quality threshold is not attained.

Phase 1.2 – Remote stakeholder-review

1. Short proposals passing to this stage are **assigned randomly to and evaluated by 5 independent reviewers,** selected from a pool of **non-academic** experts (practitioners, professionals dealing with social challenges, policy-makers, etc.).
2. The assessment is conducted remotely according to the following scoring scheme:

   » **Score 'A':** The proposal meets the evaluation criteria and is of a high standard.

   » **Score 'B':** The proposal meets the evaluation criteria to a certain extent but is not among the top 15 projects.

   Subsequently, **'A' scored proposals are ranked** according to the extent to which they meet the corresponding criteria.

   ⚠ **IMPORTANT:** *Based on a mathematical model (see Annexes),* ***15 proposals must be scored as 'A' and ranked*** *to guarantee that a sufficient number of proposals pass to the next stage. All proposals scored with an 'A' must be ranked. Proposals scored with 'B' are not ranked.*

3. At this stage of the evaluation process, proposals are assessed based solely on their **'social relevance'.**
4. Resulting from the scoring described above, a final ranking of proposals is generated. A maximum of **100 proposals** are selected to move on to phase 2.1.

PHASE 2:
Evaluation of full proposals

Phase 2.1 - Remote peer-review

1. Each eligible full proposal is **assigned randomly** to and **evaluated by 5 independent experts**, selected from a pool of renowned **international scholars** from different disciplines in social sciences and humanities.
2. The assessment is conducted remotely according to the following scoring scheme:

   » **Score 'A':** The proposal meets the evaluation criteria and is of a high standard.

   » **Score 'B':** The proposal meets the evaluation criteria to a certain extent but is not among the top 10 projects.

   Subsequently, **'A' scored proposals are ranked** accordingly to the extent to which they meet the corresponding criteria.

   ⚠ **IMPORTANT:** *Based on a mathematical model (see Annexes),* ***10 proposals must be scored as 'A' and ranked*** *to guarantee that a sufficient number of proposals pass to the next stage. All proposals scored with an 'A' must be ranked. Proposals scored with 'B' are not ranked.*

3. At this stage of the evaluation process, full proposals are assessed as a whole, considering all evaluation criteria: **novelty, scientific soundness, social relevance, feasibility and public engagement.**

   In this phase, evaluators are required to **provide a written assessment based on strengths and weaknesses** of the aspects mentioned above (see section 'Feedback to applicants').

4. Resulting from the scoring described above, a final ranking of proposals is generated. A maximum of **30 proposals** are selected to pass to the final evaluation phase.

Phase 2.2 - Selection panel interviews

1. The applicants of the best proposals selected in phase 2.1 are invited to **pitch their projects in front of a mixed selection panel**, formed by 9 to 12 internationally renowned experts (from inside and outside academia, in a 2:1 ratio).

2. For this purpose, reviewers use the following scoring scheme:

   - **Score 'A':** The proposal deserves to be funded in this call.
   - **Score 'B':** The proposal is not within the top 15 and therefore does not deserve to be funded in this call.

   Subsequently, **'A' scored proposals are ranked** accordingly to the extent to which they meet the corresponding criteria. The number of 'A' scored proposals corresponds to **the 15 proposals** that they consider should be funded. As a consequence, proposals not recommended for funding are scored as 'B'.

3. At this stage of the evaluation process, **proposals are assessed based on both their written full proposal and their oral defense** taking into consideration the following evaluation criteria: **novelty, scientific soundness, social relevance, feasibility and public engagement**. In parallel, **the expertise of the PL and research team** (if applicable) to adequately conduct the project are verified through a qualitative check.

RESEARCH EXPERTISE	· Do the PL's (and team's) career track record, skills and knowledge guarantee the appropriate research expertise and commitment to adequately develop the research project presented and its contingencies? · Is the suggested institutional environment (host organization) appropriate to conduct the research presented?

PUBLIC AND SOCIAL SECTOR EXPERTISE:	· Do the PL and research team (if applicable) have experience working with non-academic organizations (public sector, social entities, etc)? · Does the collaborating practitioner have appropriate experience and knowledge of the public and/or social sector? · Do they explain how and when the practitioner(s)' experience and knowledge will be incorporated into the project? · Do they provide details of how the research results will be disseminated among public and/or social sector entities in order to bridge the gaps between academia and other stakeholders?

In this phase, evaluators are required to **provide a short written assessment based on the proposal's strengths and weaknesses** (see section 'Feedback to applicants').

4. Resulting from the scoring described above, a **final ranking of the proposals** selected for funding is generated.

> In order to promote diversity in research, to pursue talent discovery and keep the value of research ideas at the core of the evaluation, **the research expertise** and the **public and social sector expertise** of the PL and team (if applicable) is assessed only after the evaluation of the proposal is complete. This check is reduced to a binary judgment of whether or not the researcher has the research expertise and the public and the social sector expertise, and resources needed to undertake the proposed research. Regardless of the position of the proposals in the ranking, **only proposals obtaining a positive check** in both expertise categories are considered for funding (a simple majority is required). The research expertise is assessed by the academic evaluators and the public and social sector expertise by the non-academic.

The members of the panel will have to express their agreement with the outcome of the process by signing a document that includes the final ranking of the proposals evaluated.

Feedback to applicants

The applicants receive feedback from the Programme Office at three points during the selection process:

1. At the end of the phase 1.2, applicants are told whether they are invited to submit a full proposal. **Individual feedback will not be provided at this stage**.

   Applicants whose short proposal obtains a 'C' score from 3 or more of the 5 evaluators and was not assigned any 'A' scores in phase 1.1 are informed that they will not be able to submit a new proposal in the next edition of the call.

2. At the end of phase 2.1 of the selection process, applicants are informed whether they have successfully passed to the final stage and therefore, they are invited to the interview. Unsuccessful proposals are sent feedback reports at this stage.

3. At the end of the selection process, applicants are informed whether they have been awarded a "la Caixa" Social Research Grant. All applicants reaching this evaluation phase receive feedback reports.

Evaluation reports

Evaluators participating in phase 2 of the assessment of proposals are required to write some comments about each application (150 words max.) on the reasoning behind their assessment and overall impression of the proposal. These comments are to provide the applicant with a constructive review of their proposal.

Evaluation reports should:

- Be strictly **professional in tone** and **constructive in spirit**.
- Aim to be **useful for the applicants** should they wish to apply for future calls.
- **Encompass the different aspects of the evaluation criteria**, considering both **strengths and weaknesses** of the proposal.

Evaluation reports should not:

- Give information about the **identity of the evaluator**.
- Contain offensive, discriminatory or **improper statements**.

⚠ **The Programme Office does not modify any comments or remarks**, which is why evaluators should be extremely careful with their wording and respectful with the applicant (e.g. when negative comments need to be made, the use of neutral evaluating expressions such as "does not reach", "could improve in", "would benefit from", "is rather poor in", etc., is preferable). A synthesized, compiled and harmonized report with the comments of the evaluators is **available for the applicants.**

Example of Evaluation Report:

STRENGTHS	WEAKNESSES
» The proposal is well written, solid and very innovative in Spain or Portugal. The originality of the proposed research and the potential impact on science and everyday life was fully and clearly highlighted.	» The project is not innovative in terms of the assumptions addressed and methodology proposed. Technical aspects such as how the empirical part will function and what the applications would be are insufficiently described.
» The objectives are ambitious and the scientific outcomes are relevant. The project presented is timely and feasible in the timescale foreseen.	» Although it is an interesting proposal, it lacks originality. It is unclear, whether the project represents a substantial advance in science.
» The applicant has access to top-class data. The methodology proposed is consistent with the objectives of the project and the social challenge addressed.	» Lack of a detailed work plan and assessment of the possible difficulties and ways to solve them.

Appeal procedure

In the event that a proposal is dismissed at any stage of the selection process**, no redress or appeal procedure is allowed**. The selection process is not subject to redress nor will the technical and scientific assessment of the evaluators be called into question. "la Caixa" Foundation is in no case responsible for comments from the evaluation experts. The evaluation and selection processes themselves guarantee the independence and objectivity of the evaluation.

"la Caixa" Foundation

Annexes

The purpose of these annexes is to present the quantitative selection procedures for the Social Research Call. The objective of the procedures that are presented here is that of selecting the best proposals from each phase to go on to the next phase, and so on successively until the final 15 selected proposals are chosen.

The assignment of reviewers and the methods of scoring and selection aim to ensure that the highest quality projects reach the interview phase, regardless of the reviewers to which they have been assigned.

ANNEX 1

Evaluation methodology and algorithms

RANKING EVALUATION METHOD

Here is a description of an evaluation method which is referred as **the ranking method** to be used in all phases of the selection procedure. It involves the following data:

C = number of applications to be evaluated

V = number of reviewers available in the pool

R = number of applications selected and ordered by each reviewer

T = final target of selected applications

n = number of reviewers that evaluated each application

Step 1: Distribution of applications.

Each application is assigned to n reviewers and all of them are distributed in a uniform (±1) and random fashion between reviewers, so that each reviewer receives $\frac{nC}{V}$ applications, assigned at random. The distribution algorithm is described in **Annex 2**.

The assignments are sufficiently random to make it highly improbable that two reviewers will receive the same set of applications, or equally for two applications to be assigned to the same reviewers.

EXAMPLE: If there are C = 1000 applications and V = 50 reviewers, and each application is evaluated by n = 5 reviewers, then each reviewer has 100 applications to evaluate.

Step 2: Evaluation.

Each reviewer, based on their own criteria, classifies his/her applications into 3 groups

» **Score 'A':** The proposal meets the evaluation criteria and is of a high standard.
» **Score 'B':** The proposal meets the evaluation criteria to a certain extent.
» **Score 'C':** The proposal does not meet the criteria adequately (only in phase 1.1).

with the condition that group 'A' must have exactly the R **best applications,** and these have to be **ordered**.

The applications assigned then received the following scores:

R · the best application in group 'A'

...

1 · the least good application in group 'A'

o · all the applications of groups 'B' and 'C'.

Step 3: Ordering and selection.

As a consequence of Step 2, each application has received n marks

$N_1, N_2, \ldots, N_n$

With these n marks, the following calculations are made:

» **Frequency A** (F_a) or number of reviewers that have considered the application among the best R (i.e., in group 'A'). Equivalently, F_a is the number of marks with an A.

$$F_a = \#\{i \mid N_i \in A\}$$ (natural number from 0 to n).

» **Frequency B** (F_b) or number of reviewers that have considered that the application meets the evaluation criteria to a certain extent but it is not among the best R (i.e., in group 'B'). Equivalently, F_b is the number of marks with a B.

$$F_b = \#\{i \mid N_i \in B\}$$ (natural number from 0 to n).

» **Total mark** (NT), or the sum of the marks obtained.

$$NT = \sum_{i=1}^{n} N_i$$ (natural number from 0 to nR)

» **Dispersion** (D) or measure of how different they are from each other (without taking into account those that are equal to zero). The dispersion calculation is made through the standard deviation[1] or more specifically:

$$D = \frac{1}{\sqrt{F}} \sqrt{\sum_{\substack{i=1 \\ n_i \neq o}}^{n} (N_i - \bar{N})^2}$$

where denotes $\bar{N}$ the average of marks different to zero: $\bar{N} = \frac{NT}{F}$

1. The population standard deviation is used here. Despite the fact that it would be more appropriate to use the sample standard deviation (using F-1 instead of F), in this case it is equivalent as it will exclusively be used for the purposes of ordering.

Next, only applications for which the frequency is not 0 (in other words those assigned to group 'A' by at least one reviewer) are selected and these are ordered using the following criteria (successively in the case of a tie):

» **Criterion 1** = the frequency F_a, from highest to lowest.
» **Criterion 2** = the frequency F_b, from highest to lowest.
» **Criterion 3** = the overall mark NT, from highest to lowest.
» **Criterion 4** = the dispersion D, from lowest to highest.

This provides an ordered list from which the applications that occupy the T top positions are selected. In the specific implementations of the ranking method, it will be attempted to adjust R and V so that the T applications chosen have an F_a value higher than or equal to 2, in other words that they have been chosen by 2 or more reviewers.

With the ranking method, **it is not necessary to carry out standardisations** as the bias produced by the upwards or downwards tendency of each of the reviewers is eliminated.

EXAMPLE:

The ranking method is simulated with the following parameters:
C = 40 applications to be evaluated
R = 6 applications ordered by each reviewer
n = 5 reviewers that evaluate each application

With a simulation of a pool of V = 15 reviewers. Given that $\frac{40 \cdot 5}{15}$ = 13.33, each reviewer has examined 13 or 14 applications, and has ordered the best R = 6, following his or her own criteria.

Table 1 shows the results once the 5 marks are obtained

$$N_1, N_2, N_3, N_4, N_5,$$

The applications are ordered with $NT \neq 0$ (in this case 25 are obtained), by the ranking method. Once this ordering is obtained it is possible to select from it any number $T \leq 25$.

However, those applications with F_a = 1, in other words chosen only by one reviewer, cannot be decided between by using dispersion. It is for this reason that it is desirable for those T applications selected to have an F_a value higher than or equal to 2.

TABLE 1:
SIMULATION OF ORDERING BY THE RANKING METHOD
WITH C=40, R=6 AND N=5

APP/EVAL	N_1	N_2	N_3	N_4	N_5	F_a	F_b	NT	D
S1	6	6	6	5	5	5	0	28	0.49
S2	6	6	6	6	3	5	0	27	1.20
S3	6	5	5	5	5	5	0	26	0.40
S4	5	5	5	4	3	5	0	22	0.80
S5	6	6	5	4	1	5	0	22	1.85
S6	6	5	4	3	3	5	0	21	1.17
S7	4	4	4	4	4	5	0	20	0.00
S8	6	6	5	2	1	5	0	20	2.10
S9	5	4	3	3	3	5	0	18	0.80
S10	6	4	3	3	2	5	0	18	1.36
S11	4	3	3	3	1	5	0	11	0.98
S12	6	4	4	2	B	4	1	16	1.41
S13	5	4	3	2	B	4	1	14	1.12
S14	3	2	2	1	B	4	1	8	0.71
S15	3	2	2	1	B	4	1	8	0.71
S16	3	3	1	B	C	4	1	7	0.94
S17	2	1	1	B	C	3	1	4	0.47
S18	4	2	B	B	C	3	2	6	1.00
S19	5	1	B	B	C	2	2	6	2.00
S20	3	1	B	B	C	2	2	4	1.00
S21	2	1	B	B	C	2	2	3	0.50
S22	1	1	B	B	B	2	3	2	0.00
S23	2	B	B	B	B	1	4	2	0.00
S24	1	B	B	C	C	1	2	1	0.00
S25	1	B	C	C	C	1	1	1	0.00

Depending on the number C of applications and on the quantity T suitable for selection, it is necessary to determine a sufficiently large pool V of reviewers and a sufficiently large number R of applications to be ordered by each reviewer, to achieve a suitable number T of applications with $F_a \geq 2$.

ANNEX 2

Algorithm for assignment of applications to reviewers

The following variables are used:

C = number of applications or applications to be evaluated

V = number of reviewers available in the pool

n = number of reviewers that evaluated each application

The objective consists of assigning reviewers to each application randomly so that:

- The applications are distributed uniformly, at a rate of (the whole part of) $\frac{C \cdot n}{V}$ for each reviewer. If this is not a whole number, some of the reviewers will have one application more to add to the total number;
- It is highly improbable for two applications to be evaluated by the same group of reviewers;
- It is highly improbable for two reviewers to review exactly the same applications.

THE ALGORITHM

A matrix m is built with dimensions C x V, initially all with zeros. The rows represent the applications and the columns the reviewers. The element $m[c,v]$ will be equal to 1 if and only if the application c is assigned to reviewer v.

A vector is created with measurement V named the *capacity vector,* where each element corresponds to a reviewer and denotes the quantity of applications that are lacking assignment to the reviewer in question. Thus, all the vector entries **are initialized with the value** $\left[\frac{C \cdot n}{V}\right]$, where $[\cdot]$ denotes the whole part. In the case of non-whole division, some elements (by random) have one unit more, such that the sum is $C \cdot n$, the total of applications.

For each row, in other words for each application c, and for $i = 1, \ldots, n$ times, we determine from among all of the reviewers those that have **maximum capacity**, and that have not yet been assigned to c (in other words such that $m[c,v] = 0$). From among these, we choose one at random, v', and assign to that reviewer the application c, in other words we put $m[c,v'] = 1$, and we reduce the capacity of v' by one unit.

The algorithm finally confirms that all the rows add up to n, and that all the columns add up to $\left[\frac{C \cdot n}{V}\right]$ o $\left[\frac{C \cdot n}{V}\right] + 1$, in such a way that the total number of assignments (elements = 1) is $C \cdot n$.

EXAMPLE OF IMPLEMENTATION

Table 2 shows the result of an algorithm execution to distribute C = 30 applications between V = 11 reviewers, in such a way that each application is evaluated by n = 5 reviewers. It is observed that the rows all add up to 5, while the columns all add up to 13 or 14, so that the total is equal to 30·5=150, the number of evaluations to be carried out.

TABLE 2:
EXAMPLE OF ASSIGNMENT OF 30 APPLICATIONS TO A POOL OF 11 REVIEWERS

App/ Eval	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	
S1	1	1	0	0	1	0	0	0	0	1	1	5
S2	0	0	1	0	0	1	1	1	1	0	0	5
S3	1	0	0	1	1	0	0	0	1	0	1	5
S4	0	1	0	1	0	1	1	1	0	0	0	5
S5	0	1	1	0	0	0	0	1	0	1	1	5
S6	1	0	0	1	0	0	1	0	1	1	0	5
S7	0	0	1	1	1	1	0	0	0	0	1	5
S8	1	0	0	0	0	1	1	1	0	1	0	5
S9	0	1	1	1	1	0	0	0	1	0	0	5
S10	1	0	1	0	1	0	1	0	0	1	0	5
S11	0	1	0	0	0	1	0	1	1	0	1	5
S12	0	1	0	0	0	1	0	1	1	0	1	5
S13	1	0	0	1	1	0	1	0	0	1	0	5
S14	1	0	1	1	1	0	0	1	0	0	0	5
S15	0	0	1	0	0	0	1	0	1	1	1	5
S16	1	1	1	0	0	1	0	0	0	0	1	5
S17	0	1	0	1	0	1	0	0	1	1	0	5
S18	1	0	0	0	1	1	1	1	0	0	0	5
S19	0	1	0	1	0	0	1	0	1	1	0	5
S20	0	0	1	1	1	0	0	1	0	0	1	5
S21	1	1	1	0	1	1	0	0	0	0	0	5
S22	0	0	0	0	0	0	1	1	1	1	1	5
S23	0	0	0	1	1	1	0	0	0	1	1	5
S24	1	0	1	0	0	0	1	1	1	0	0	5
S25	1	1	1	1	0	0	0	0	0	1	0	5
S26	0	1	0	0	0	1	0	1	1	0	1	5
S27	1	0	0	1	1	0	1	0	0	0	1	5
S28	0	1	0	0	1	1	1	0	0	1	0	5
S29	0	1	1	0	0	0	0	1	1	0	1	5
S30	1	0	0	0	1	1	0	1	1	0	0	5
	14	14	13	13	14	14	13	14	14	13	14	

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