



Assessment of proposals

Social Research Call 2020



"la Caixa" Foundation

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 to provide new reliable knowledge to broaden our understanding of the major challenges of today.

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

Some elements have been introduced to ease the entire process while ensuring its general robustness and consistency:

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 increase and illustrate 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 discriminate proposals in a straightforward way, relying on their expertise**.
3. Great effort has been devoted to **implementing a fair and responsible review process**. The system relies on scholars (peer-review) and non-academic practitioners (stakeholder-review) in order to **gain an insight with different evaluation approaches for specific criteria**.
4. Furthermore, in order to promote diversity in research by mitigating the influence of biases related to gender and other factors, to keep the value of the research ideas at the core of the evaluation and to pursue talent discovery, an innovative **triple-blind multi-phase selection process** has been designed with the following measures: I) applicants remain anonymous until the last step of the selection process, II) research proposals and researchers are reviewed separately, III) researchers are assessed only after the evaluation of the proposal is complete and III) researcher’s assessment is reduced to a binary judgment of whether or not the investigator has the expertise and resources needed to undertake the proposed research.

In this way, the application and selection process are expected to facilitate the attraction and discovery of the most innovative projects able to, at the same time, bring robust and valuable knowledge to the corresponding social research fields.

Principles of good governance

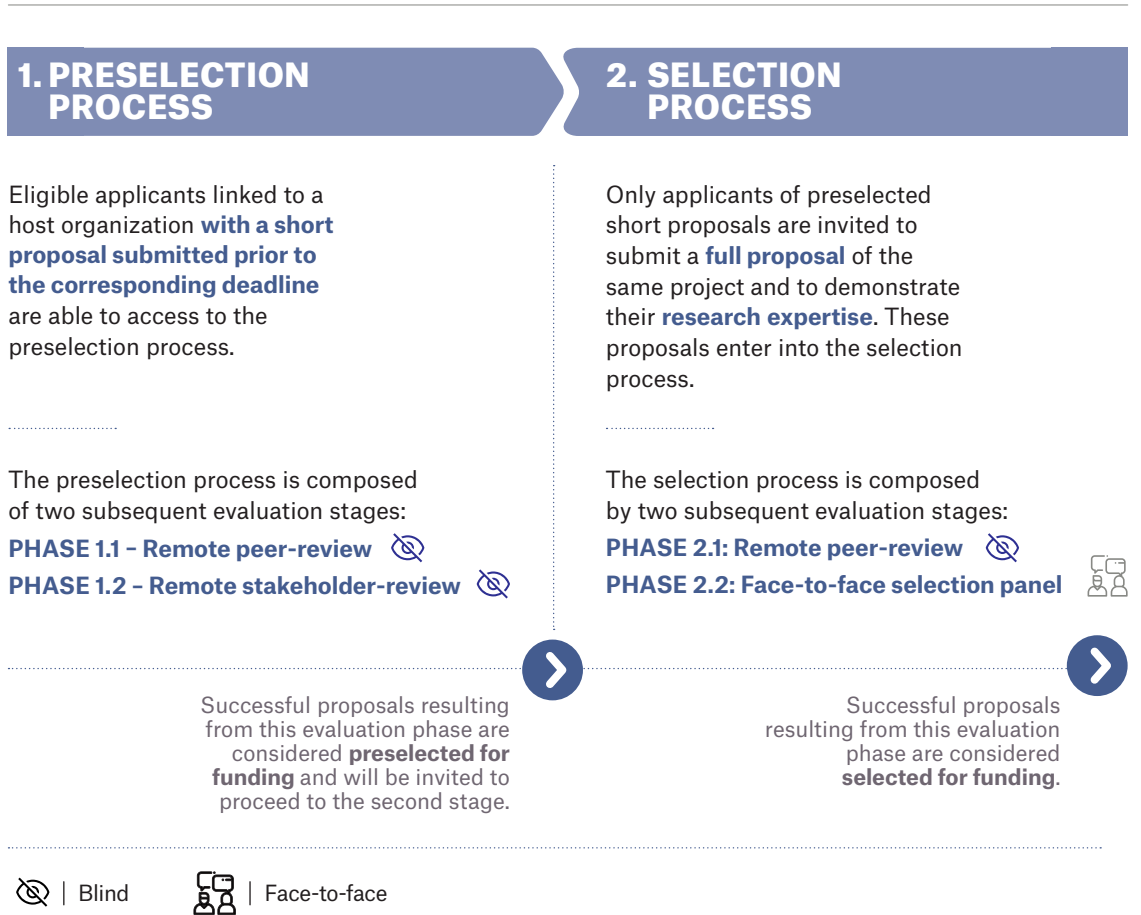
The following principles are the cornerstone of the Social Research call selection process. They will govern the whole process and ensure the fair selection of the best proposals:

- » **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 for that purpose, which are available on the "la Caixa" Social Research 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 according to the 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 with high quality standards.
- » **QUALITY.** This call welcomes proposals of every disciplinary nature within social research. Proposals will be evaluated taking into account both scientific soundness and down-to-earth topics and approaches. Reviewers will form multidisciplinary panels of independent experts combining both international and national profiles. Furthermore, with the aim of promoting social research that bridges science and society, stakeholders (mainly practitioners of 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 but also for assuring 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 face-to-face selection panel: (1) Reviewers will not know the 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, research group or institution leading the project can be recognized, (2) applicants will not know the identity of the reviewers, which will be published after the selection of projects and (3) the reviewers will not know the identity of the rest of the reviewers evaluating the proposals, with the exception of the face-to-face selection panel.

Overview

The Programme Office will proceed to 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 according to the process described below.

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



For more information on the documentation of each stage, visit the **"la Caixa" Social Research website**

Evaluation criteria

Evaluation criteria considered in the call only concern the research proposal quality. 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 disruptive 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 credible, 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 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?

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 allows an easy discernment of how far proposals successfully meet the evaluation criteria. 'C's are only considered in the evaluation phase 1.1, as an indicator of insufficient quality.
- » a subsequent ranking of 'A' scored proposals per reviewer that allow the best proposals to emerge and proceed to the next evaluation phase.

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

1. Assignment system
2. Scoring scheme
3. Evaluation criteria
4. Ranking of successful proposals


PHASE 1: Preselection of proposals - Evaluation of short proposals

Phase 1.1 - 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 the social sciences.
2. The assessment is done remotely according to the following scoring scheme:

- » **Score 'A'**: The proposal meets the evaluation criteria to the highest standards.
- » **Score 'B'**: The proposal meets the evaluation criteria to a certain extent.
- » **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' must not be 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 containing information by which **the identity of the applicant**, research group or the institution leading the project can be recognized. Such proposals will be declared ineligible and will be excluded from the selection process.

 **IMPORTANT:** Applicants whose proposal does not receive at least three As or Bs in the current edition of the call will not be able to apply for the next one.


4. Resulting from 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 – 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 to the highest standards.
- » **Score 'B'**: The proposal meets the evaluation criteria to a certain extent.

Subsequently, **'A' scored proposals are ranked** according to the extent in 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' must not be 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 pass to the following stage.


PHASE 2: Selection of proposals - Evaluation of full proposals

Phase 2.1 - 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 the social sciences.
2. The assessment is conducted remotely according to the following scoring scheme:

- » **Score 'A'**: The proposal meets the evaluation criteria to the highest standards.
- » **Score 'B'**: The proposal meets the evaluation criteria to a certain extent.

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' must not be ranked.*

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

- The applicants of the 30 best proposals selected are invited to **pitch their projects in front of a mixed selection panel**, formed by 10 to 12 internationally renowned experts (from inside and outside academia, on a 2:1 ratio).
- For this purpose, reviewers use the following scoring scheme:

- » **Score 'A'**: The proposal meets the evaluation criteria to the highest standards.
- » **Score 'B'**: The proposal meets the evaluation criteria to a certain extent.

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

- 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, feasibility and social relevance**. In parallel, **the expertise of the PL and research team** (if any) to adequately conduct the project are verified through a qualitative check.

- EXPERTISE YES/NO**
- Does the PL (and team) career track record, skills and knowledge provided 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?

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').

- Resulting from the scoring described above, a **final ranking of the 15 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 expertise** of researchers is assessed only after the evaluation of the proposal is complete it is reduced to a binary judgment of whether or not

the investigator has the 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 their expertise are considered for funding (a simple majority is required).

The members of the panel should 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 preselection process, applicants are informed whether they are invited or not to submit a full proposal.
2. At the end of the 2.1 phase of the selection process, applicants are informed whether they have successfully passed to the final stage and therefore, they are invited to the face-to-face interview. Non-selected 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 a rationale for each application (150 words max.) on the reasoning behind their assessment and overall impression of the proposal. This rationale intends to provide the applicant 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 of", "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
<ul style="list-style-type: none">» 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 objectives are ambitious and the scientific outcomes are relevant. The project presented is timely and feasible in the timescale foreseen.» The applicant has access to top-class data. The methodology proposed is consistent with the objectives of the project and the social challenge addressed.	<ul style="list-style-type: none">» 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.» Although it is an interesting proposal, it lacks originality. It is unclear, whether the project represents a substantial advance in science.» Lack of a detailed work plan and assessment of the possible difficulties and ways to solve them.

Redress 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 the technical and scientific assessment of the evaluators is called into question. The "la Caixa" Foundation is in no case responsible for comments from the evaluation experts. The evaluation and selection processes in themselves guarantee the independence and objectivity of the evaluation.



ANNEXES

The purpose of the annexes is to present the quantitative selection procedures for the Social Research call. The objective of these procedures that are presented here is that of selecting the best proposals for each phase that go on to the following phase, and so on successively until the selected proposals reached for the final phase, from which 15 projects are awarded grants.

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

ANNEX 1

EVALUATION METHODOLOGY AND ALGORITHMS

RANKING EVALUATION METHOD

Here it is described an evaluation method which is referred as **the ranking method** to be used in all phases of the selection procedure. There is 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 to the highest standards.
- » **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'

0 · 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, \dots, N_n

With these n marks, the following quantities are calculated:

- » **Frequency** (F) or number of reviewers that have considered the application among the best R (i.e., in group 'A'). Equivalently, F is the number of marks different to zero.

$$F = \#\{i \mid N_i \neq 0\} \text{ (natural number from 0 to } n\text{)}$$

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

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

- » **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 deviation¹ or more specifically:

$$D = \frac{1}{\sqrt{F}} \sqrt{\sum_{\substack{i=1 \\ n_i \neq 0}}^n (N_i - \bar{N})^2}$$

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

- » **Criterion 1** = the frequency F , from highest to lowest.
- » **Criterion 2** = the overall mark NT , from highest to lowest.
- » **Criterion 3** = 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 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 or 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

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

And once 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 $F = 1$, 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 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	N1	N2	N3	N4	N5	F	NT	D
S1	6	6	6	5	5	5	28	0.49
S2	6	6	6	6	3	5	27	1.20
S3	6	5	5	5	5	5	26	0.40
S4	5	5	5	4	3	5	22	0.80
S5	6	6	5	4	1	5	22	1.85
S6	6	5	4	3	3	5	21	1.17
S7	4	4	4	4	4	5	20	0.00
S8	6	6	5	2	1	5	20	2.10
S9	5	4	3	3	3	5	18	0.80
S10	6	4	3	3	2	5	18	1.36
S11	4	2	2	2	1	5	11	0.98
S12	6	4	4	2		4	16	1.41
S13	5	4	3	2		4	14	1.12
S14	3	2	2	1		4	8	0.71
S15	3	2	2	1		4	8	0.71
S16	3	3	1			3	7	0.94
S17	2	1	1			3	4	0.47
S18	4	2				2	6	1.00
S19	5	1				2	6	2.00
S20	3	1				2	4	1.00
S21	2	1				2	3	0.50
S22	1	1				2	2	0.00
S23	2					1	2	0.00
S24	1					1	1	0.00
S25	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 $F \geq 2$.

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 $C \times V$, 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 an reviewer and denotes the quantity of applications that are lacking assignment to the reviewer in question. Thus, all the vector entries initially $\left\lfloor \frac{C \cdot n}{V} \right\rfloor$, where $\lfloor \cdot \rfloor$ 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 $i = 1, \dots, n$ 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 $\left\lfloor \frac{C \cdot n}{V} \right\rfloor$ o $\left\lfloor \frac{C \cdot n}{V} \right\rfloor + 1$, 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 $30 \cdot 5 = 150$, 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	

Algorithms, procedures and design of experiments drawn up by:
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