PEER REVIEW EVALUATION PROCESS OF MARIE CURIE ACTIONS UNDER EU'S FP7

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Marie Curie Actions

- EU Fellowship programmes for researchers' mobility since 1990
- Marie Curie since 1996
- Aim: Structuring training, mobility and career development for researchers
- Under FP7 (2007-2013): €4.75 billion

Marie Curie Actions

ITN → Action 1 **ITN** Early-stage Researchers

Innovative Training Networks

Support for doctoral and early-stage training **European Training Networks, European Industrial Doctorates, European Joint Doctorates**

IEF, IOF, IIF → Action 2 **IF** Experienced Researchers

Individual Fellowships

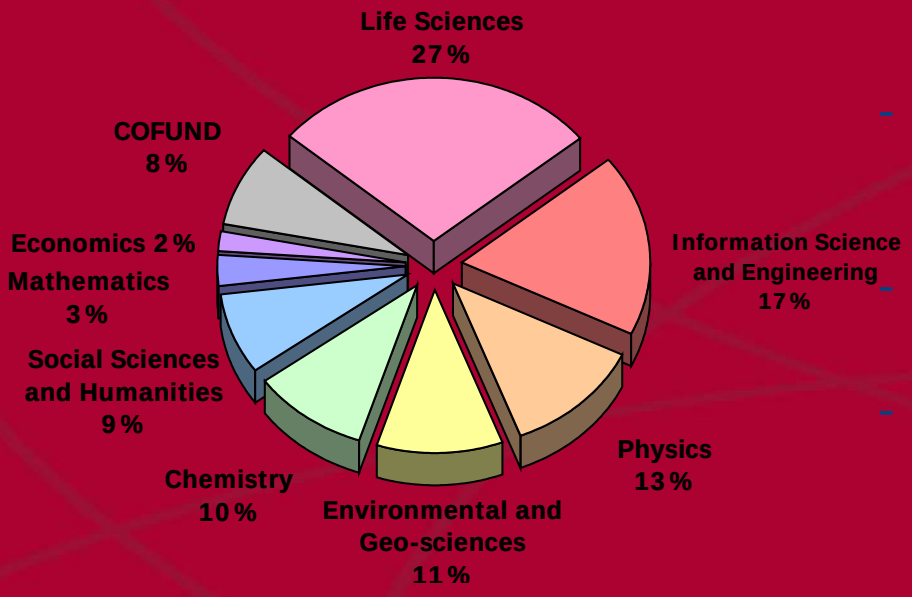
Support for experienced researchers undertaking international and inter-sector mobility: **European Fellowships** and **Global Fellowships**
Dedicated support for **career restart** and **reintegration**

IAPP → Action 3 **RISE** Exchange of Staff

Research and Innovation Staff Exchange

International and inter-sector cooperation through the exchange of staff

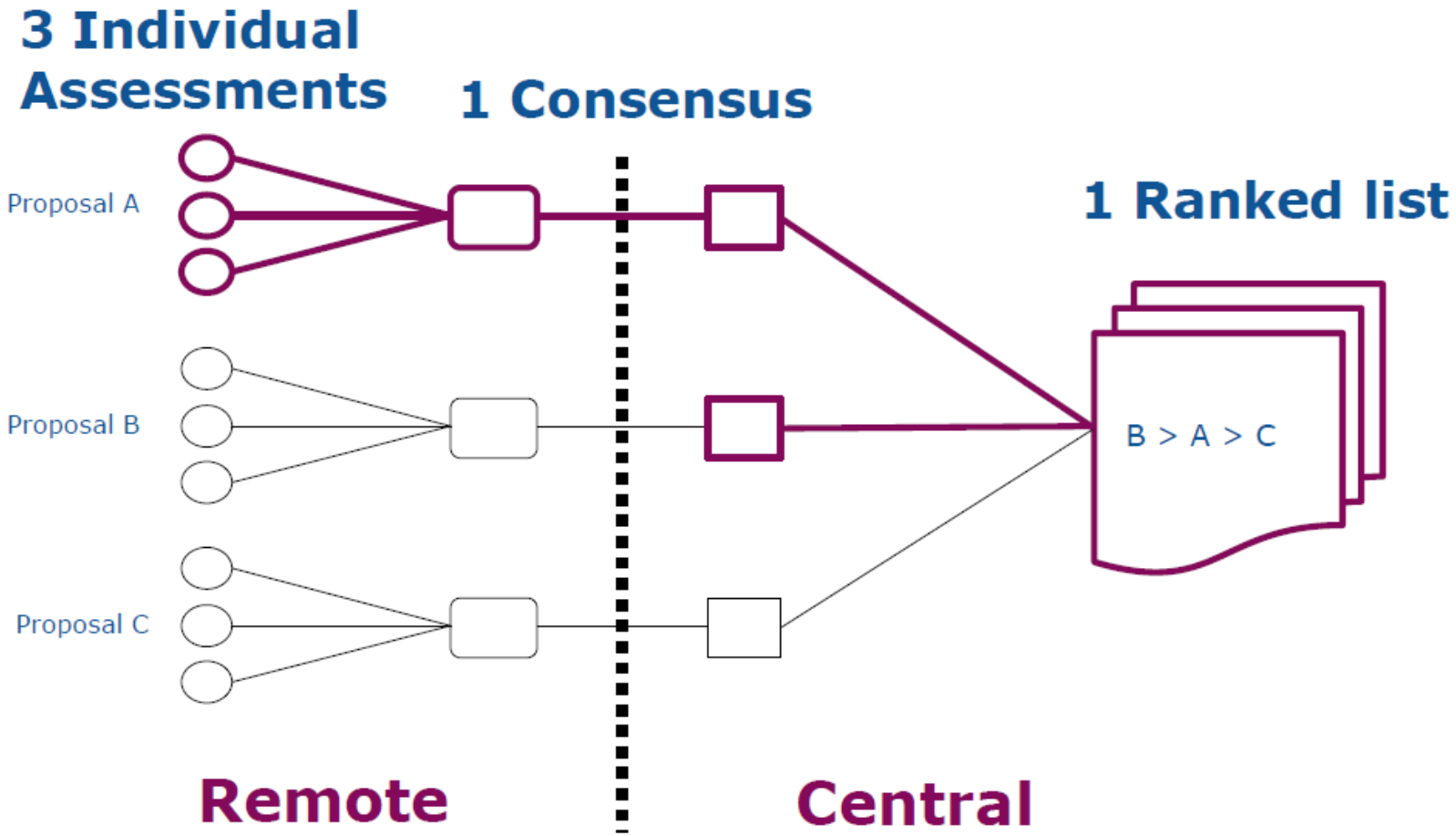
Marie Curie Actions



Budget distribution by scientific panel in FP7

- 60 000 researchers financed since the creation of the Marie Curie Actions
- More than 10 000 PhD supported in FP7
- Marie Curie researchers coming from all over the world (around 130 nationalities)
- Marie Curie host organisations in more than 80 countries
- 46% of researchers coming to EU from industrialised countries stay in Europe after the end of their IIF fellowship
- 38% women participation in FP7 MCA, close to the 40% target

Marie Curie Actions



Marie Curie Actions

Excellent. Successfully addresses all relevant aspects of the criterion in question. Any shortcomings are minor.	5		Excellent
Very Good. Addresses the criterion very well, although certain improvements are still possible.	4	4.9 – 4.0	Very Good
Good. Addresses the criterion well, although improvements would be necessary.	3	3.9 – 3.0	Good
Fair. Broadly addresses the criterion, there are significant weaknesses.	2	2.9 – 2.0	Fair
Poor. Addressed in an inadequate manner, or there are serious inherent weaknesses.	1	1.9 – 1.0	Poor
Fails to address the criterion or cannot be judged due to missing or incomplete information.	0		

Marie Curie Actions

CRITERIA

- S&T Quality
- Training (ITN, IEF) or Transfer of Knowledge (IAPP)
- Researcher (IEF)
- Implementation
- Impact

Marie Curie Actions

CRITERIA – weighting (ITN example)

- S&T Quality – 30%
- Training – 20%
- Implementation – 30%
- Impact – 30%

- Example:

$4.2\times0.3+4.7\times0.2+3.8\times0.3+4.4\times0.2=4.22$

Final score $4.22\times20=84.40$ (out of max. 100)

Aim of the study

- To examine the peer-review evaluation process in three MC Actions (ITN, IEF, IAPP)
- To assess the agreement among raters in the different phases of the evaluation workflow

Data sources

- IAPP – from 2007 to 2009 and for 2011 (4 calls)
- ITN – 2008 and from 2010 to 2012 (4 calls)
- IEF – from 2007 to 2013 (7 calls).

- Total:

n=24 897 proposals

n=74 691 individual evaluation reports – reviews

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n=74 691 individual evaluation reports – reviews

Agreement among reviewers

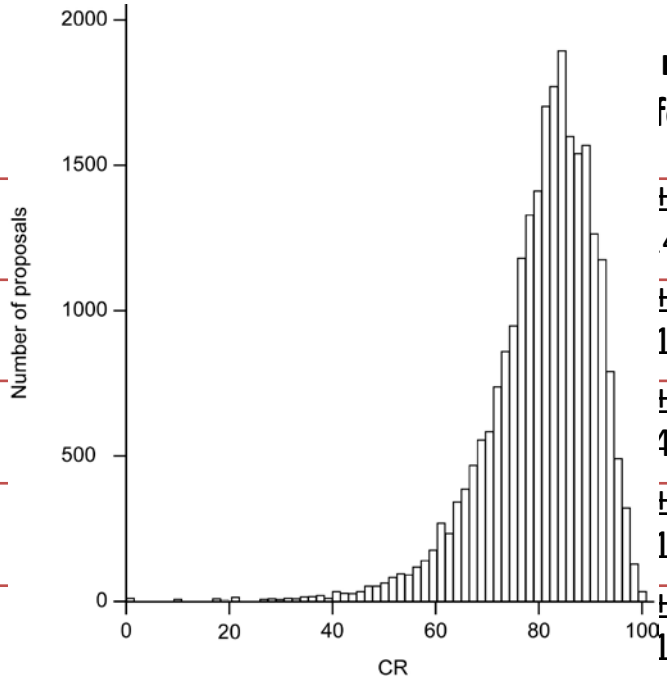
Average Deviation (AD) index

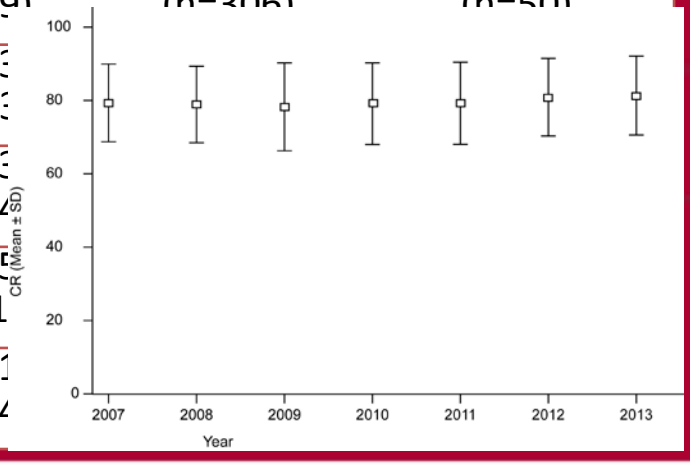
Burke MJ, Finkelstein LM, Dusig MS. On average deviation indices for estimating interrater agreement. Organizational Research Methods. 1999;2: 49-68

- Measure of disagreement that involves determining the average difference between scores of individual raters and the average scores of all raters
- Does not require the specification of null distribution
- Estimates inter-rater disagreement in the units of the original scale

Results

Panel	Mean score (±SD) in proposals where:			Mean score (±SD) in proposals with AVIER vs CR difference
		rater fers	All raters differ	
Total		±13.1 424)	ICC (one-way random) range: 0.46 – 0.64 Overall:ICC=0.67, 95%CI=0.66-0.68	
Chemisty		±13.2 132)		
Economic and Social Sciences/Humanities		±13.1 431)	(n=600)	(n=142)
Information Science/Engineering		±13.7 199)	69.2±12.7 (n=306)	62.7±18.0 (n=50)
Environment		±13 153		
Life Sciences	80.9±10.3 (n=7658)	82.0±9.4 (n=6785)	74.5±13 (n=354	
Mathematics	78.2±10.2 (n=731)	79.6±8.6 (n=623)	71.1±15 (n=41	
Physics	80.8±9.2 (n=2940)	81.6±8.5 (n=2644)	75.3±11 (n=114	

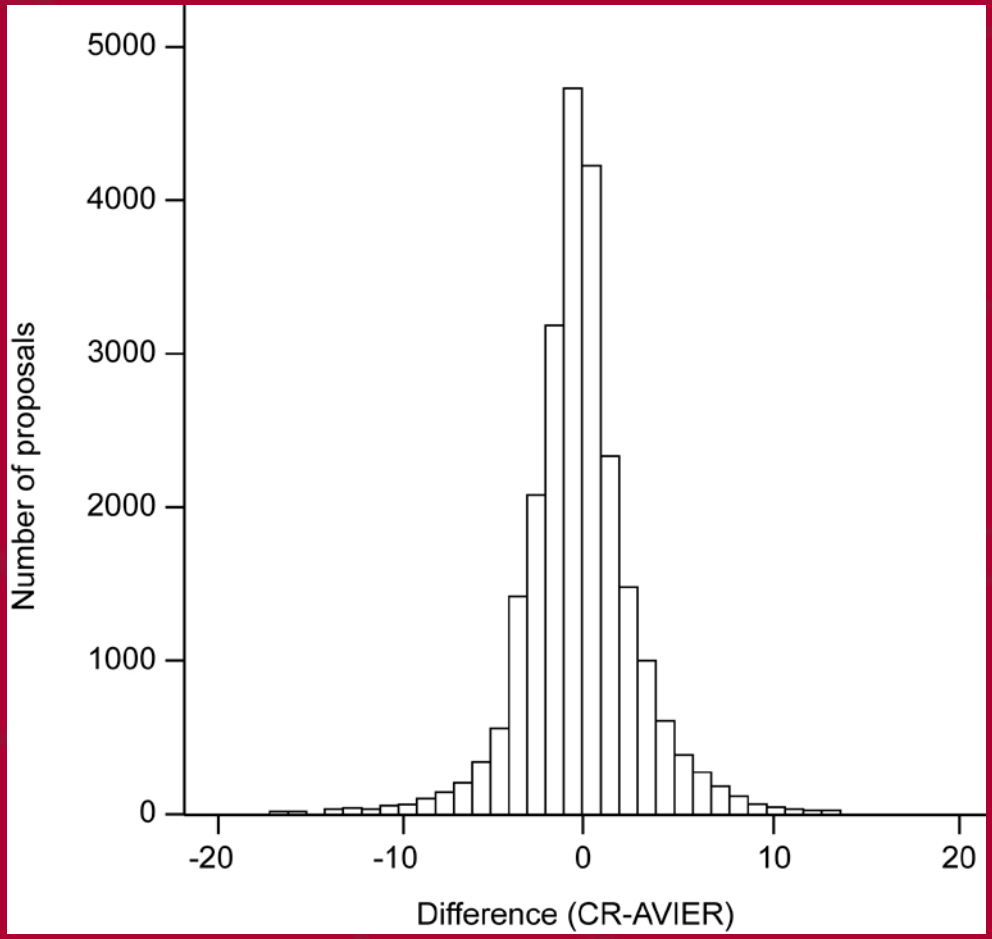




Results

Panel	Disagreement (No. Proposals, row %)		
	One rater differs	All raters differ	AVIER vs CR difference
IAPP (n=759)	71 (9.4%)	124 (16.3%)	23 (3.0%)
ITN (n=3545)	280 (7.9%)	415 (11.7%)	104 (2.9%)
IEF (n=20593)	1073 (5.2%)	1536 (7.5%)	241 (1.2%)

Results

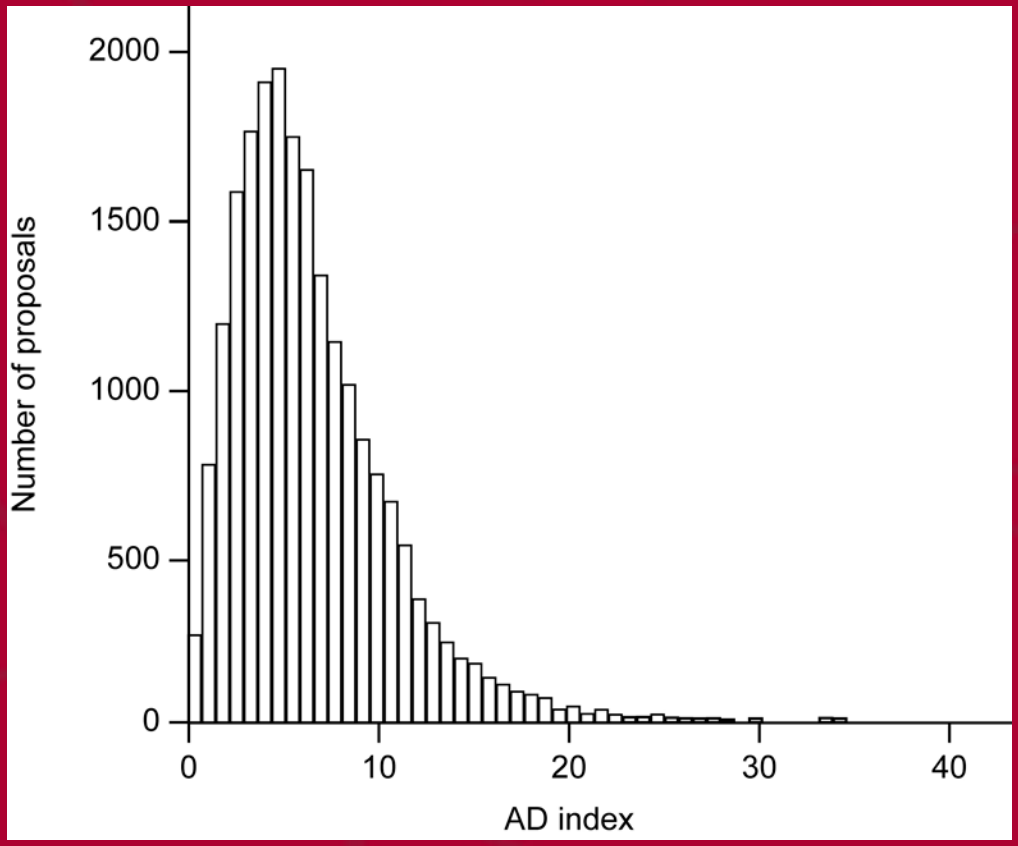


Distribution of differences between Consensus Reports (CR) and average Individual Evaluation Reports (AVIER) scores
Mean = -0.3
SD = 3.19

61.4% of all proposals had less than 2 points difference between AVIER and CR scores

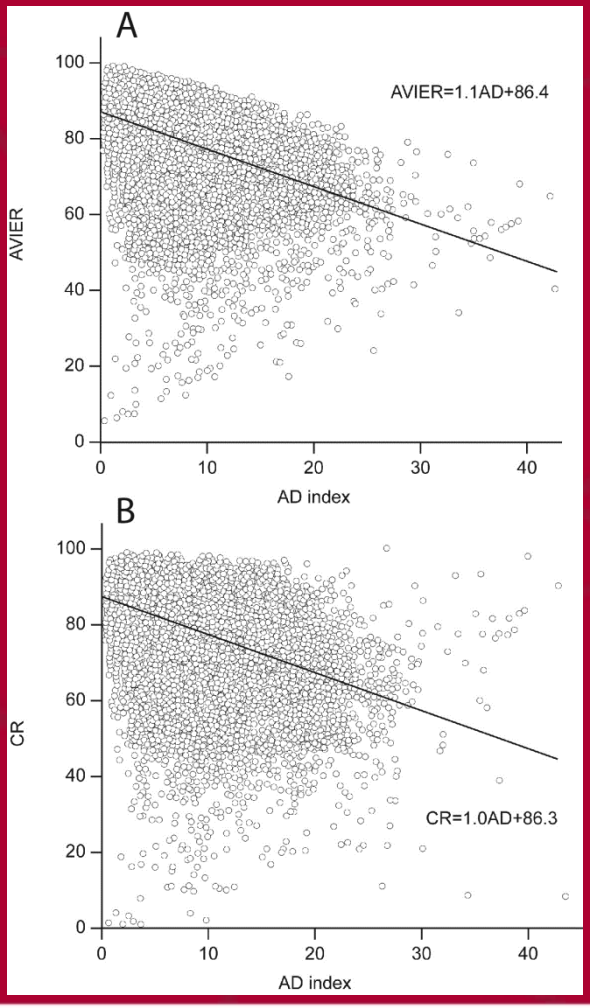
IER – individual evaluation report
AVIER – average IER from remote ev.
CR – consensus report

Results



Overall median AD index = 5.4 points (on a scale 0-100)
For three quarters of all proposals equal or below 8.3 points

Results



More disagreement for proposals with lower scores

IER – individual evaluation report
AVIER – average IER from remote ev.
CR – consensus report
AD – average difference

Results

	No. proposals(row %) with disagreement
Panel (No. proposals)	One rater differs
Chemistry (n=2665)	132 (5.0)
Economic and Social Sciences/Humanities (n=4677)	431 (9.2)
Information Science/Engineering (n=2983)	199 (6.7)
Environment/Geosciences (n=3243)	153 (4.7)
Life Sciences (n=7658)	354 (4.6)
Mathematics (n=731)	41 (5.6)
Physics (n=2940)	114 (3.9)
Total (n=24897)	**1424 (5.7)**

Scenario 1: one rater scores a proposal in a completely different way than the other two raters

a) two agree (difference between their scores less than or equal to 5 points – because 5.4 was the median AD for all proposals)

b) One disagrees for ≥10 points - because this would put the difference above 3rd quartile for all AD indices for IER scores

Results

	No. proposals(row %) with disagreement	
Panel (No. proposals)	One rater differs	All raters differ
Chemistry (n=2665)	132 (5.0)	171 (6.4)
Economic and Social Sciences/Humanities (n=4677)	431 (9.2)	600 (12.8)
Information Science/Engineering (n=2983)	199 (6.7)	306 (10.3)
Environment/Geosciences (n=3243)	153 (4.7)	230 (7.1)
Life Sciences (n=7658)	354 (4.6)	519 (6.8)
Mathematics (n=731)	41 (5.6)	67 (9.2)
Physics (n=2940)	114 (3.9)	182 (6.2)
Total (n=24897)	1424 (5.7)	**2075 (8.3)**

Scenario 3: Disagreement of all three raters

a) difference between eeach pair of IER scores ≥10 points (on a scale 0-100)

Results

	No. proposals(row %) with disagreement		
Panel (No. proposals)	One rater differs	All raters differ	Difference in AVIER vs CR
Chemistry (n=2665)	132 (5.0)	171 (6.4)	32 (1.2)
Economic and Social Sciences/Humanities (n=4677)	431 (9.2)	600 (12.8)	142 (3.0)
Information Science/Engineering (n=2983)	199 (6.7)	306 (10.3)	50 (1.7)
Environment/Geosciences (n=3243)	153 (4.7)	230 (7.1)	42 (1.3)
Life Sciences (n=7658)	354 (4.6)	519 (6.8)	71 (0.9)
Mathematics (n=731)	41 (5.6)	67 (9.2)	5 (0.7)
Physics (n=2940)	114 (3.9)	182 (6.2)	26 (0.9)
Total (n=24897)	1424 (5.7)	2075 (8.3)	368 (1.5)

Scenario 3: absolute difference between CR and AVIER scores ≥10 (scale 0-100)

Positive and negative differences were equally distributed (180 or 48.9% positive and 188 or 51.1% negative differences)

Significantly lower CR scores than other proposals (69.3±19.8 vs 79.8±11.0; $p<0.001$)

Results

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Results

Pearson's inter-correlations of IER criteria of different raters

		Rater 1					Rater2					Rater 3				
		S&T quality	Training/ToK	Researcher	Implementation	Impact	S&T quality	Training/ToK	Researcher	Implementation	Impact	S&T quality	Training/ToK	Researcher	Implementation	Impact
Rater 1	S&T quality	1	0.698	0.600	0.668	0.693	0.291	0.279	0.231	0.278	0.274	0.296	0.290	0.231	0.289	0.282
	Training/ToK		1	0.582	0.718	0.740	0.282	0.361	0.248	0.319	0.324	0.270	0.357	0.236	0.324	0.320
	Researcher			1	0.582	0.646	0.217	0.231	0.293	0.230	0.241	0.234	0.246	0.306	0.249	0.251
	Implementation				1	0.740	0.281	0.330	0.247	0.360	0.328	0.282	0.335	0.254	0.367	0.330
	Impact					1	0.278	0.325	0.251	0.318	0.341	0.277	0.327	0.260	0.328	0.341
Rater 2	S&T quality												0.286	0.230	0.285	0.276
	Training/ToK												0.369	0.250	0.335	0.328
	Researcher												0.240	0.294	0.244	0.244
	Implementation												0.332	0.245	0.367	0.330
	Impact												0.322	0.256	0.329	0.342
Rater 3	S&T quality												0.695	0.606	0.665	0.690
	Training/ToK												1	0.589	0.710	0.737
	Researcher													1	0.573	0.645
	Implementation														1	0.733
	Impact															1

Low correlations between different rater's scores for the same criterion and the same proposal
High correlations of the same rater's scores of different criteria for the same proposal

➢ Raters scored proposals in a more holistic way and, generally, assessed each criterion in relation to the other criteria of the same proposal

Results

Principal components analysis with the evaluation criteria – to investigate latent structure that underlies a set of items (criteria scored by three raters)

- Three components, each representing a single rater
- Confirmed our conclusion that criteria scores reflected the rater's global score rather than specific aspects of the proposal.
- The three-component solution explained large portion of variance (73%) and component loadings were very high (all above 0.7).

Conclusions

- Good internal consistency and overall high agreement among expert reviewers
- Disagreement was greater for proposals with lower scores
- At least for some of the proposals, the remote assessments and its average score (AVIER) can provide reliable final judgment of the proposal (especially for IF)

Conclusions

- About 15% of the proposals' population that may need more discussion in order to reach consensus on the final score
- IAPP and ITN calls had a greater number of proposals with disagreements, demonstrating that the evaluation of complex proposals, involving partnerships of several research groups with multidisciplinary and inter-sectorial features, require a more elaborate review procedure