



American Institute of Biological Sciences

Informing Decision-making for Science and Society

Scientific Peer Advisory and Review Services

www.spars.aibs.org

AIBS History & Background

- American Institute of Biological Sciences (AIBS) is a nonprofit 501(c)(3)
- Founded in 1947 as a part of the National Academy of Sciences
- Became an independent, member-governed organization in the 1950s
- Membership includes:
 - Over 130 professional societies and scientific organizations
- **Mission - to promote the use of science to inform decision-making that advances biology for the benefit of science and society.**



NATIONAL ACADEMY
OF SCIENCES



Key AIBS Activities

Supporting AIBS' mission of informing decision making, we:

- Publish the peer-reviewed journal BioScience; produces podcasts
- Convene professional development training courses, webinars, etc.
- Promote scientific research and education through public policy
- ***Provide scientific peer review and advisory services to a wide range of government, foundation, and academic clients***

Scientific Peer Review

- **Scientific Peer Advisory and Review Services (SPARS®)** division of AIBS was established in 1963
- Over 50 years experience providing all manner of expert review and advisory services in diverse topic areas for many different clients
- Since 2007, over 50,000 individual expert peer reviews performed

Valued partner in science®



AIBS – Practitioner of Peer Review



- To ensure the use of best practices, we refer to the scientific literature for validated procedures
- However, there is a limited evidence base surrounding the practice of peer review of grants
- We are committed to analyzing data from our reviews to not only improve our processes, but to contribute to the literature exploring the **science of peer review**

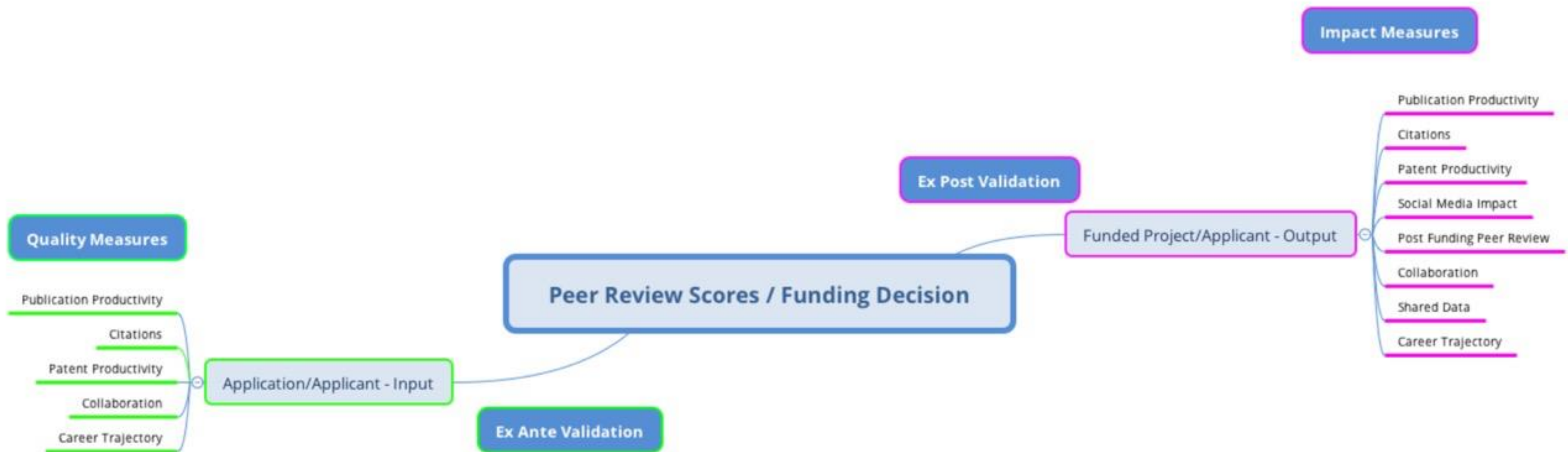
Expectations of Peer Review Process for Grant Applications



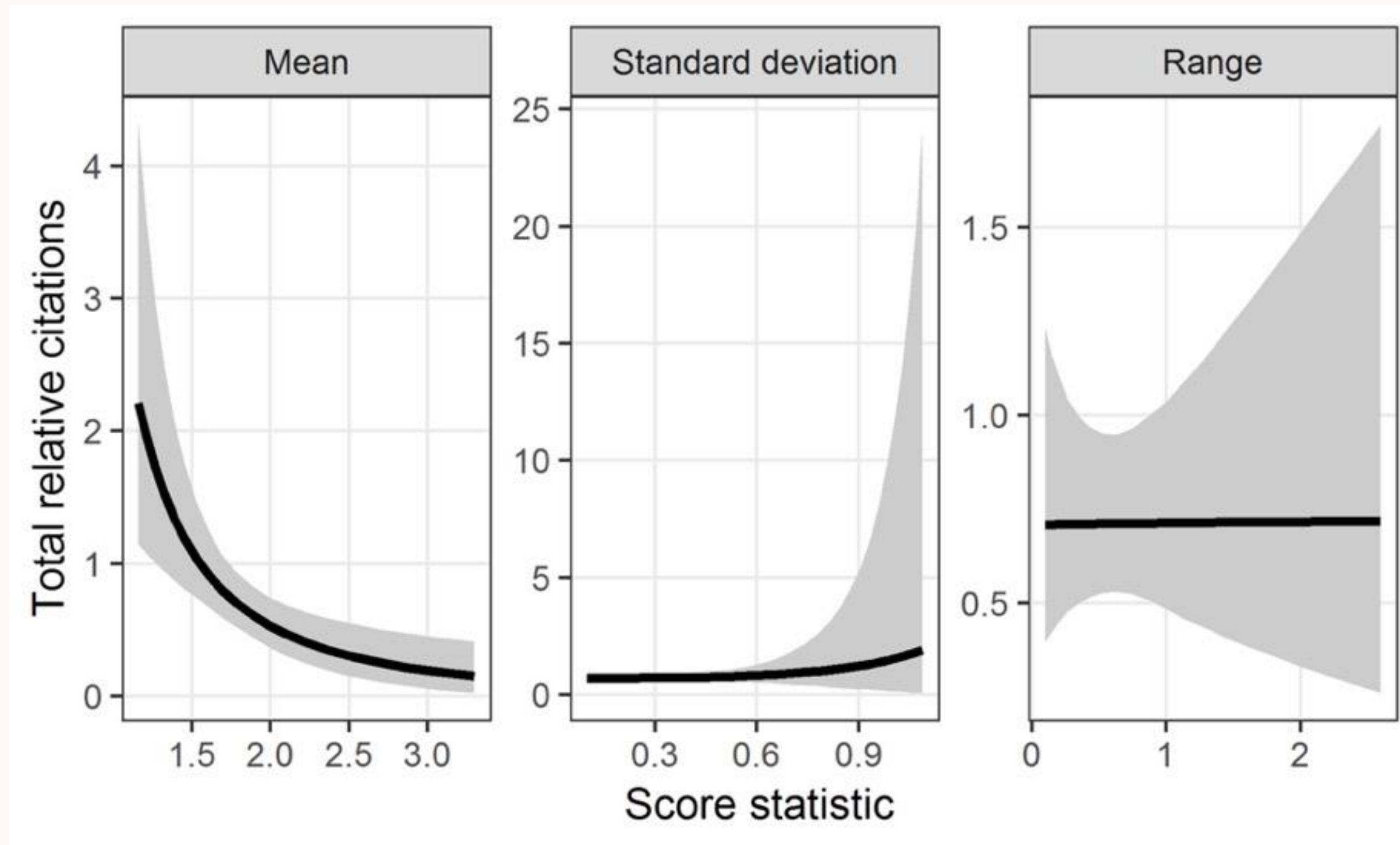
- **Effective** in identifying research which serves the best interests of science and program objectives
- **Efficient** in terms of time, money and energy of participants
- **Accountable** to all stakeholders
- **Rational** and reliable processes
- **Fair** processes with equitable treatment of all applicants
- **Valid** and reliable metrics of both outcomes and processes
- **Responsive** to funder, reviewers, applicants and other stakeholder requirements and needs

Operational Characteristics

- Many operational characteristics of grant peer review and their relationship to each other have not been well documented
- What are normal values for these characteristics?
- How do these characteristics relate to the expectations for peer review?

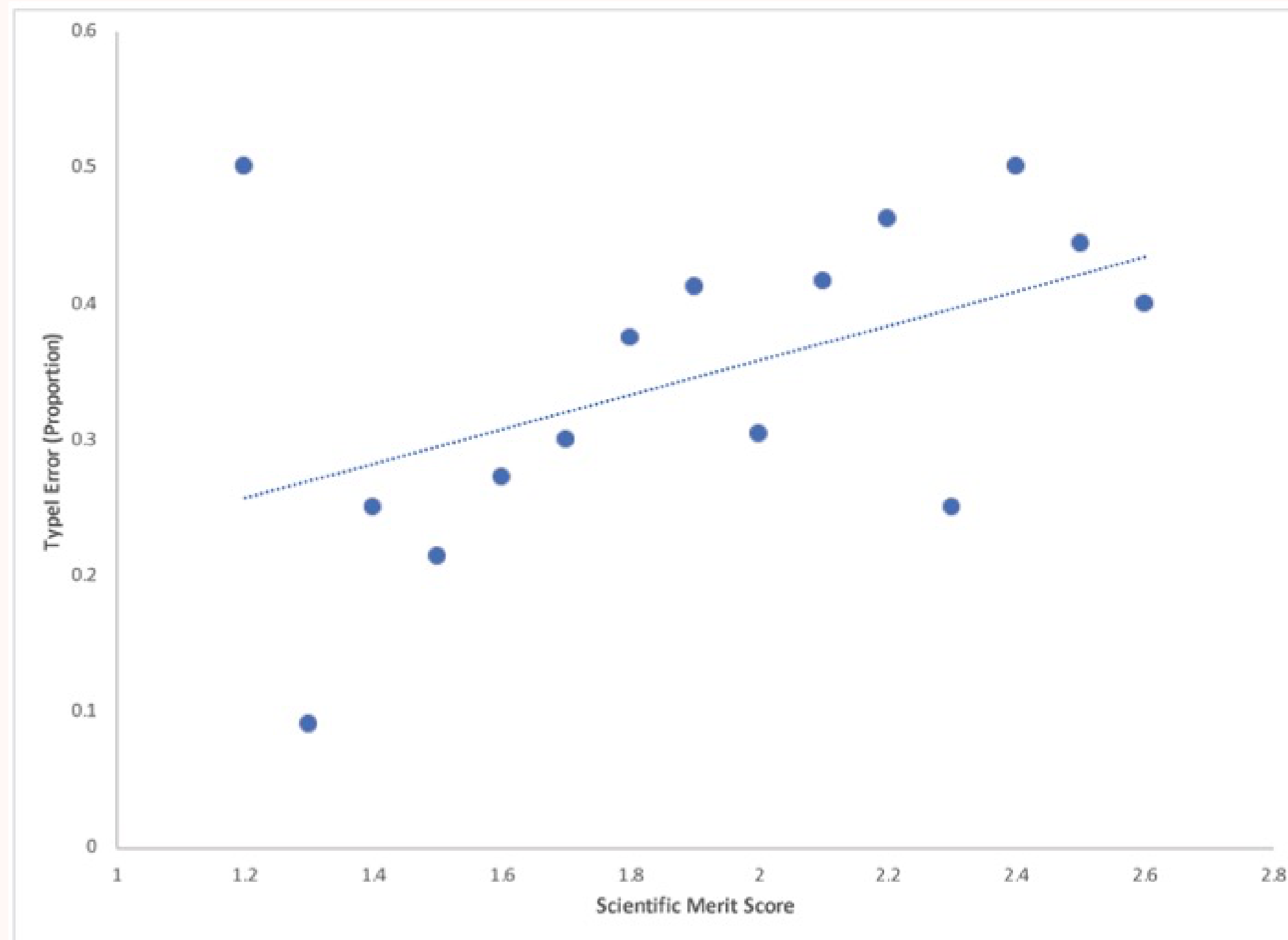


EFFECTIVE Average Total Relative Citation Level Versus Average Application Score Using Score Grouping

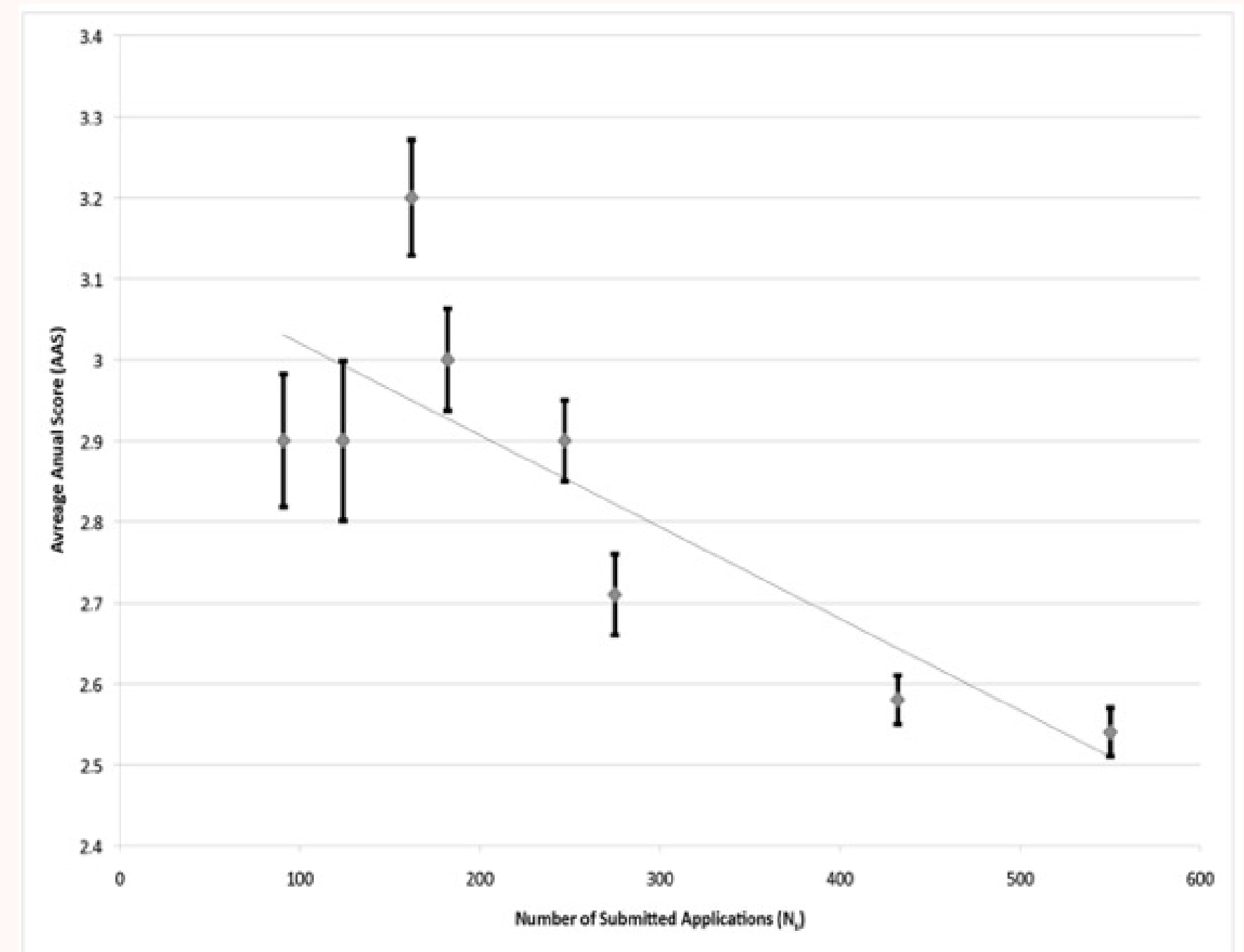
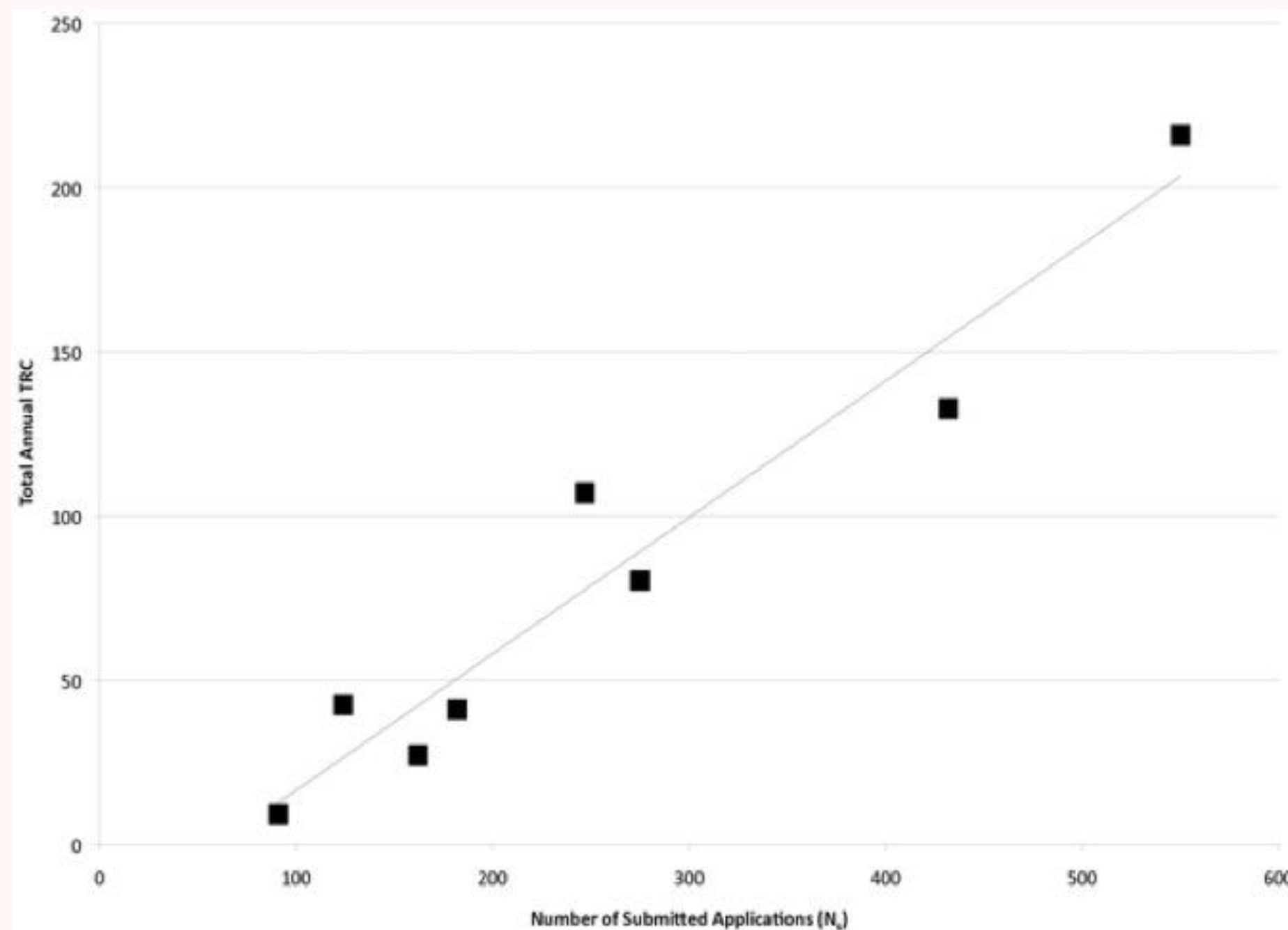


Barnett et al. (2018) Do Funding Applications Where Peer Reviewers Disagree Have Higher Citations? A Cross-Sectional Study. *F1000 Research* 7

EFFECTIVE Rate of Unproductive Grants (Type I Error) versus Score

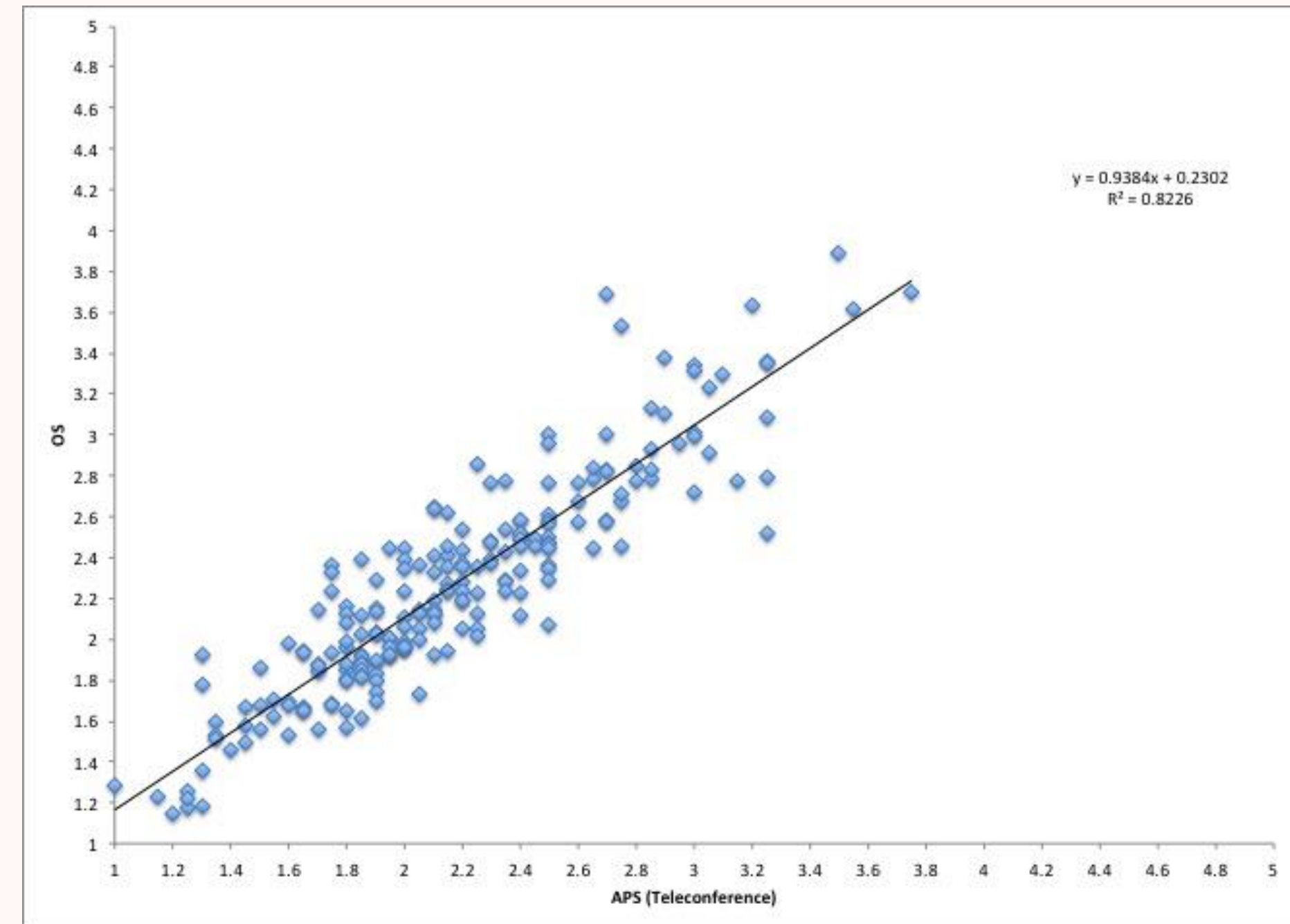
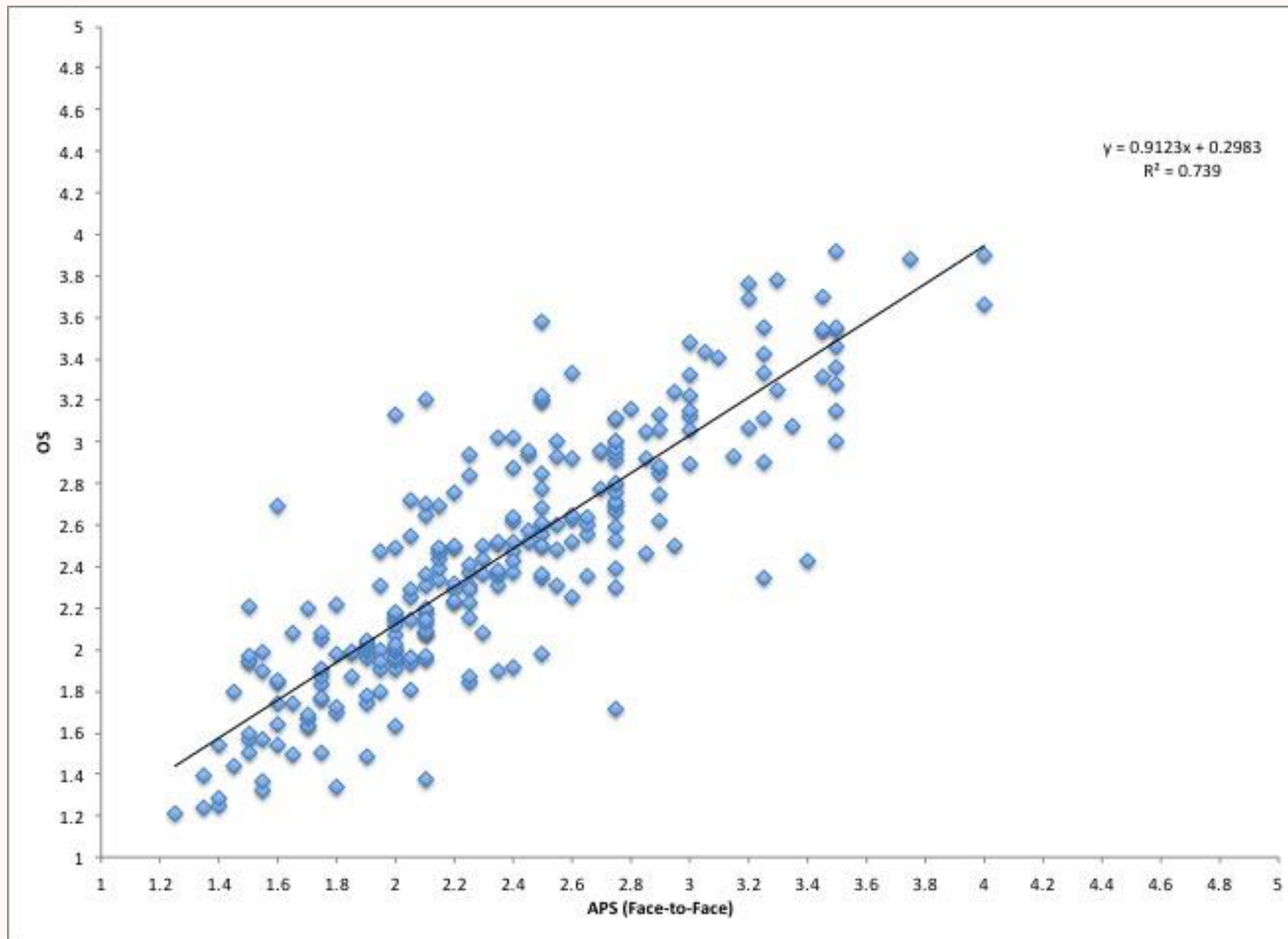


EFFECTIVE PORTFOLIO: Total Annual Relative Citation Versus Number of Submitted Applications

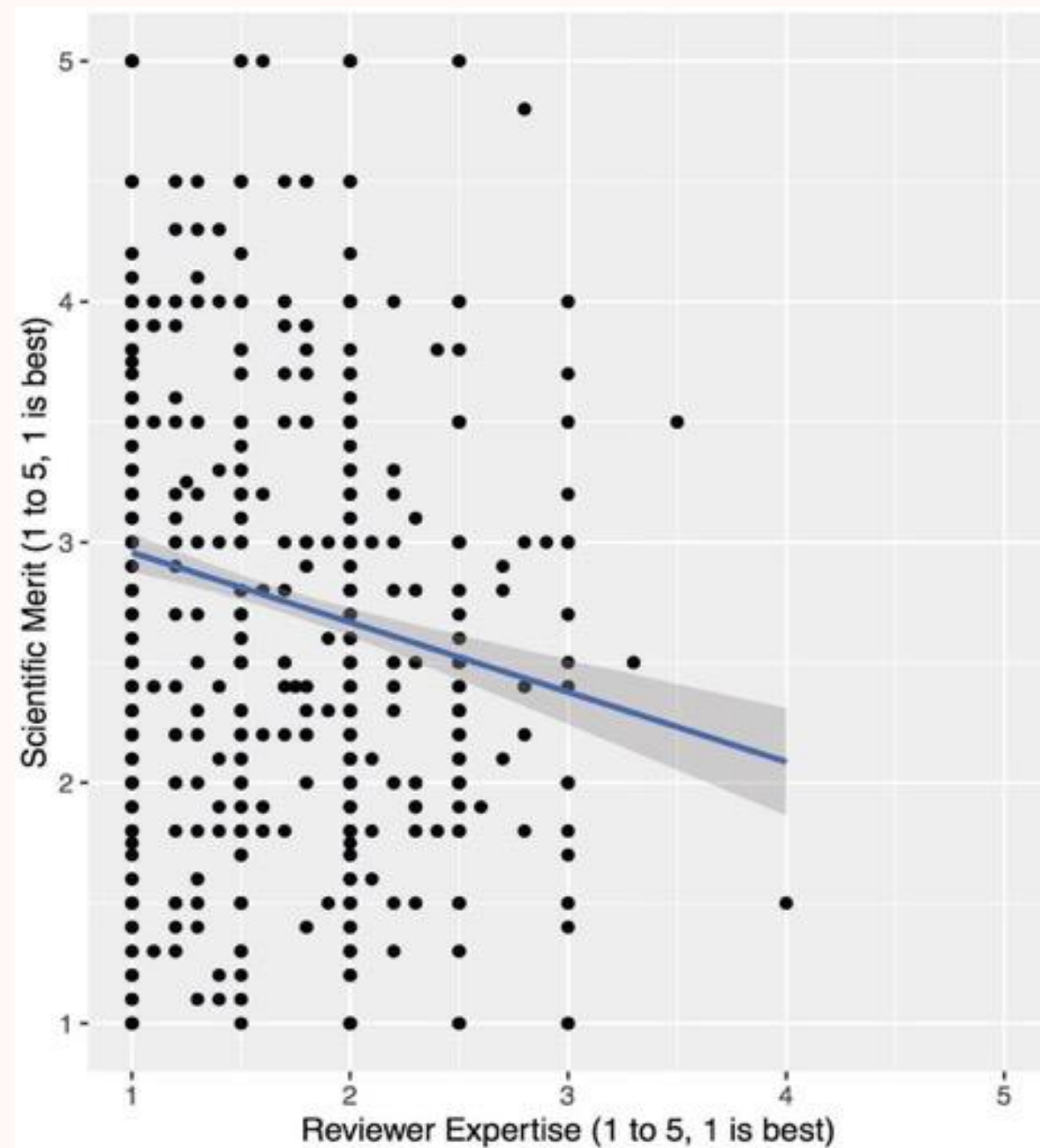


	Applicants (%)	Reviewers (%)	Test for Difference
Innovation	24	81	$X^2 (1) = 475$ ($p < 0.001$), s.e.=2.2%
Research Team	11	57	$X^2 (1) = 336$ ($p < 0.001$), s.e.=2.3%
Risk	27	58	$X^2 (1) = 102$ ($p < 0.001$), s.e.=2.8%

EFFICIENT? Relationship Between Average Pre-meeting Score (APS) and Overall Score (OS) for Face-to-face and Teleconference Reviews



Individual Reviewers– Mail Review



On-Site Panel Average

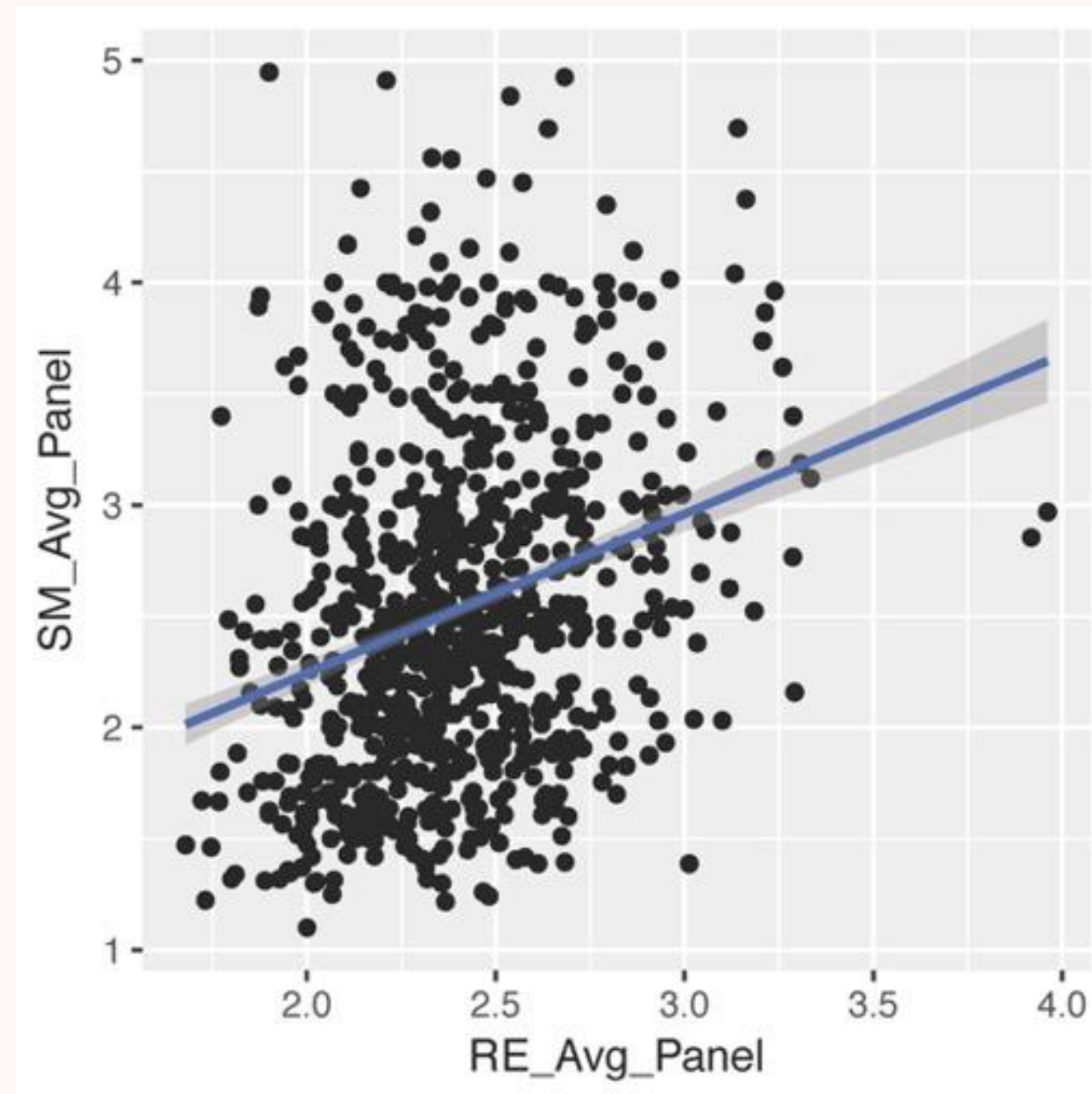
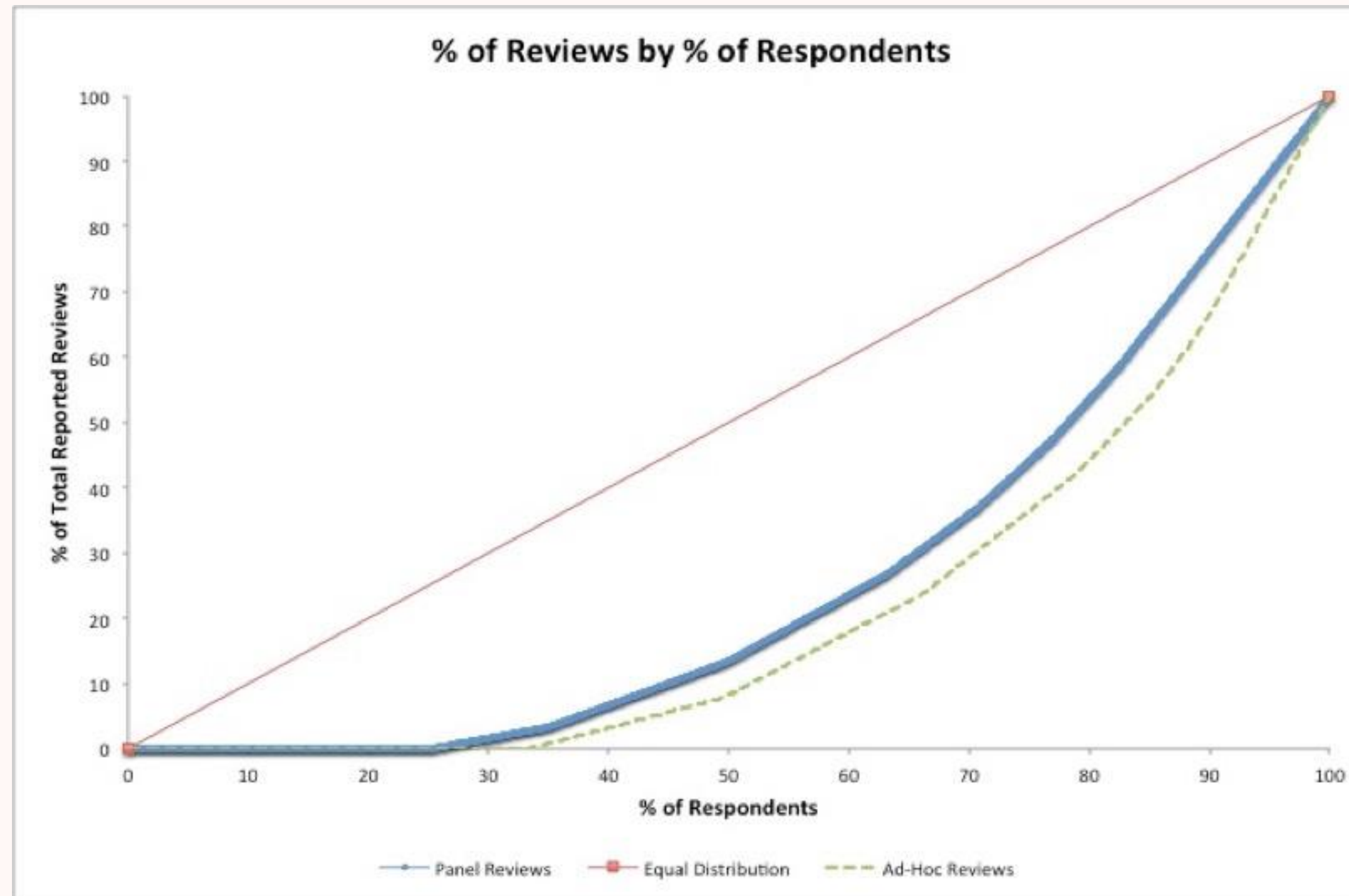


Table 1					
Panel	Total COIs	% Total COIs AIBS Detected	COIs (Self-report/Staff-detected)		
			Organizational (1)	Collaborative (2)	Additional (7)
1	8	88%	0/3	1/3	0/1
2	5	100%	0/2	0/3	0/0
3	4	0%	0/0	2/0	2/0
4	3	67%	0/1	1/1	0/0
5	16	75%	0/3	3/9	1/0
6	15	73%	0/11	3/0	1/0
7	6	67%	0/0	2/4	0/0
8	9	22%	0/1	7/1	0/0
TOTAL	66	65%	0/21	19/21	4/1

RESPONSIVE? Applicant/Reviewer Survey (N=999)



RESPONSIVE? What Predicts Grant Review Participation ($R^2=0.17$, $p<0.001$; $N=849$)



Factor	Coefficient (standard error)	p-value
Gender	0.01 (0.17)	0.97
Age	0.00 (0.01)	0.89
Non/Hispanic White Caucasian	-0.02 (0.19)	0.91
PhD Degree	0.45 (0.21)	0.03*
Academic Organization	-0.15 (0.23)	0.52
Work Week Hours	0.02 (0.01)	0.05
Early/Mid Career Stage	-0.85 (0.21)	<0.001**
Number of Grant Submissions	0.28 (0.04)	<0.001**
Frequency of Journal Reviewing	0.17 (0.04)	<0.001**

Future Directions

- More involvement from academic community
Psychology, decision science, team science, behavioral economics
- More transparency from research funders
Access to data and public self-evaluation
- Funds to conduct analyses and potentially prospective trials
- More consolidation of knowledge in this area
Literature reviews, reports of practices across funding agencies
- More communication of these results and interpretation by the community
Participate in AIBS webinars on peer review and research funding

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