The Fallibility of Expert Scientists:
How *Score Calibration Talk* Undermines Fairness in the Scientific Peer Review Process

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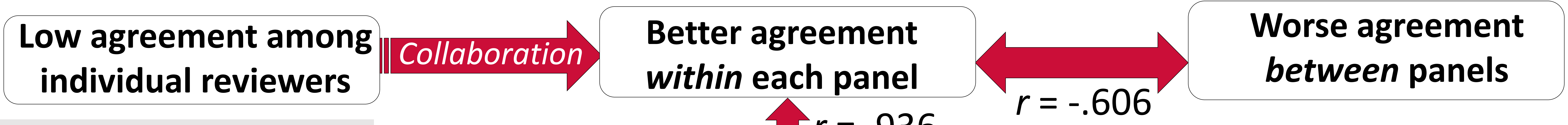


Low agreement among individual reviewers

Collaboration

Better agreement *within* each panel

r = -.606

Worse agreement *between* panels

r = .936

Score Calibration Talk

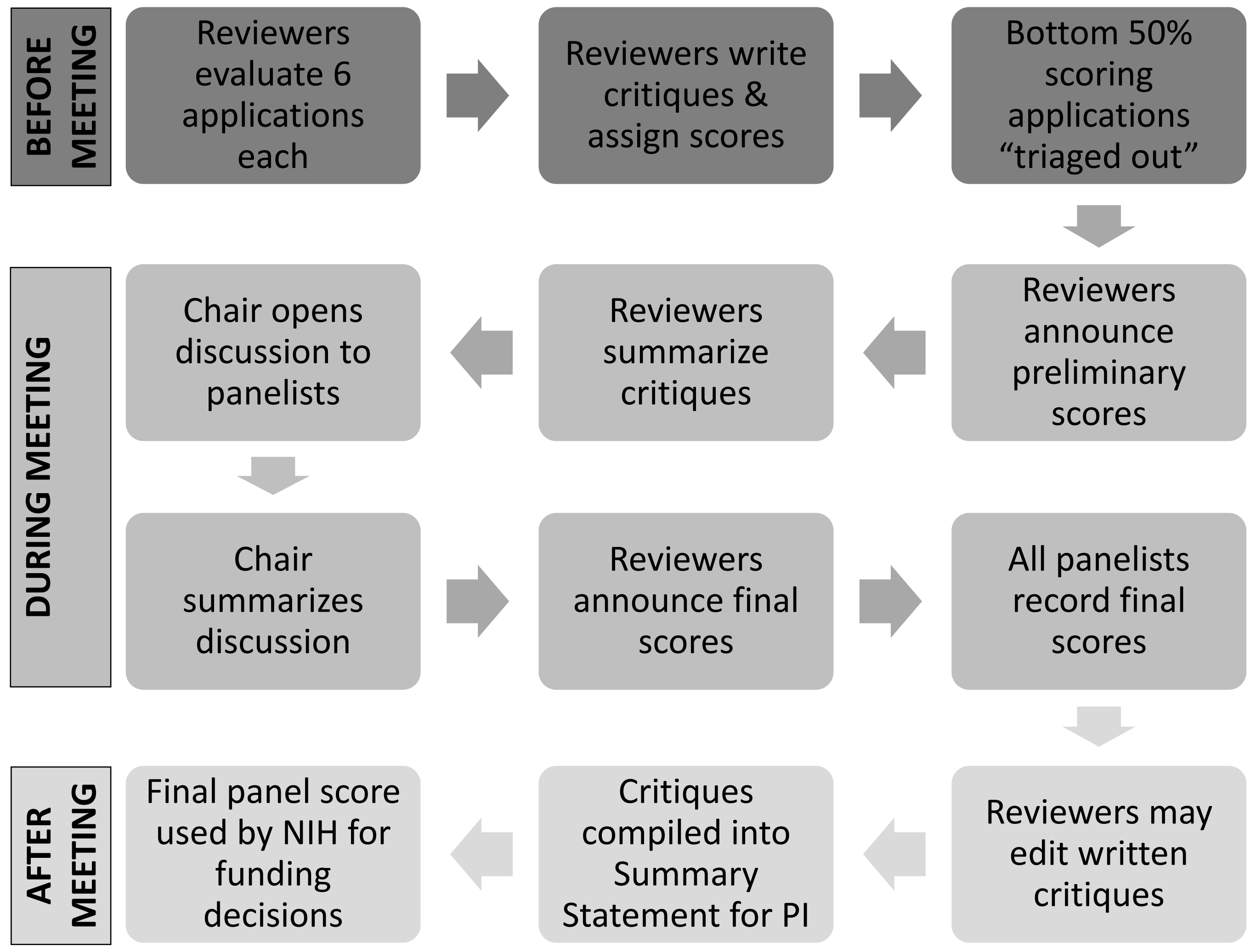
Constructed Study Sections

42 experienced reviewers for NIH participating in one of four videotaped ***Constructed Study Sections*** (CSS)

reviewed

25 R01 grant applications submitted between 2012 – 2015 to the Oncology 1 or Oncology 2 review groups within NIH's National Cancer Institute

De-identified screenshot from one CSS



BEFORE MEETING

Reviewers evaluate 6 applications each → Reviewers write critiques & assign scores → Bottom 50% scoring applications "triaged out"

DURING MEETING

Reviewers announce preliminary scores → Reviewers summarize critiques → Chair opens discussion to panelists → Chair summarizes discussion → Reviewers announce final scores → All panelists record final scores

AFTER MEETING

Reviewers may edit written critiques → Critiques compiled into Summary Statement for PI → Final panel score used by NIH for funding decisions

Overall Impact	Score	Descriptor
High	1	Exceptional
	2	Outstanding
	3	Excellent
Medium	4	Very Good
	5	Good
	6	Satisfactory
Low	7	Fair
	8	Marginal
	9	Poor

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Self-Initiated SCT

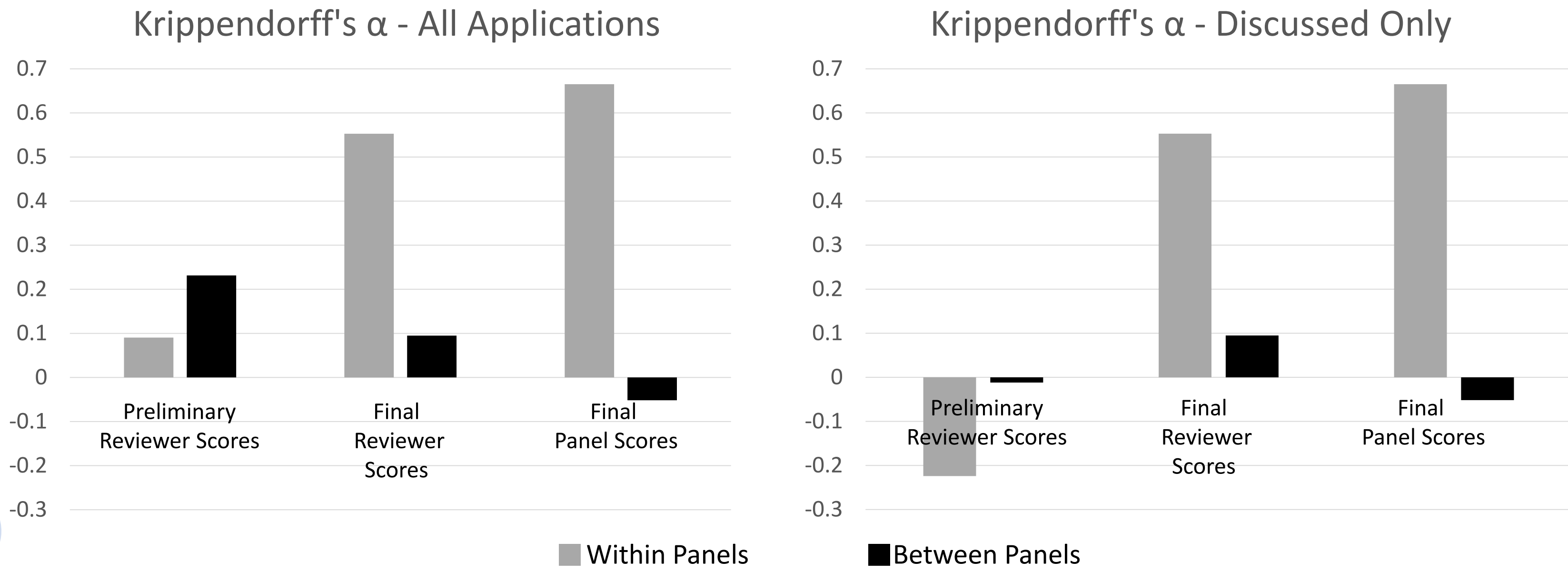
TB-2: Yeah so I gave it a one, and you know, as you mentioned before, you only give a one once in a lifetime, so to speak. And I thought that this was one of the the best grants I guess I've ever written—I've ever read, because really cause of three things. There is, I thought that the impact was large and obvious, and it was largely driven by quite a bit of of preliminary data...

Other-Initiated SCT

Chair: Other comments? *(pause)* So with that, let's hear our new scores?
MP-1: So I'll move to a four.
Chair: Secondary?
CV-2: Uh, I'll move to four also.
Chair: Dr. Joshi?
GJ-3: I had four to begin with and I'll stay there.
Chair: Anyone outside that ra—these are pretty serious concerns that were raised. Four is a very high score.
JR: Yeah.
CV-2: Yeah mine, actually go to a five. *(group laughter)*
Chair: Okay.
GJ-3: I'll go to five.
MP01: I'll go to five.
Chair: Let's go again. The preliminary-um new scores are? *(group laughter)* Preliminary? Dr. Patil?
MP-1: Five.
CV-2: Five.
GJ-3: Five.

Score Calibration Talk (SCT)

	CSS1	CSS2	CSS3	CSS4	*Total*
Self-Initiated SCT					
# instances	15	18	11	12	56
Time (m:s)	3:33	4:36	2:09	2:37	12:55
Other-Initiated SCT					
# instances	7	3	4	1	15
Time (m:s)	6:07	4:28	5:27	1:46	17:48
Total SCT					
# instances	22	21	15	15	71
Time (m:s)	9:40	9:04	7:36	4:23	30:43



Values of α > .80 are "reliable", .67 - .80 are "tentative" (Krippendorff, 2013)

Range of scores for an application significantly ***decreased*** within each panel after discussion:

	Prelim Range	**Final Range**	$t_{(df)}$, p
CSS1	*M* = 1.91 (*SD* = 0.94)	*M* = 0.73 (*SD* = 0.91)	t_{10} =3.99 *p* = .003
CSS2	*M* = 1.91 (*SD* = 1.30)	*M* = 0.73 (*SD* = 0.786)	t_{10} =4.49 *p* = .001
CSS3	*M* = 2.09 (*SD* = 1.22)	*M* = 1.09 (*SD* = 0.54)	t_{10} =2.80 *p* = .019
CSS4	*M* = 1.75 (*SD* = 0.89)	*M* = 0.88 (*SD* = 0.35)	t_{7} =2.97 *p* = .021

Range of scores for an application significantly ***increased*** between panels after discussion:

Prelim Range	**Final Range**	$t_{(df)}$, p
M = 0.71 (*SD* = 0.45)	*M* = 1.31 (*SD* = 0.97)	t_{11} =-2.19 *p* = .05

SCT & Scoring Variability

SCT &
Reviewer Score Change:

Self-Initiated SCT	**Correlation**
# instances	*r* = .108
Time (m:s)	*r* = .067
Other-Initiated SCT	
# instances	*r* = .978
Time (m:s)	*r* = .961
Total SCT	
# instances	*r* = .717
Time (m:s)	*r* = .809

SCT &
Panel Score Convergence:

Self-Initiated SCT	**Correlation**
# instances	*r* = .682
Time (m:s)	*r* = .657
Other-Initiated SCT	
# instances	*r* = .858
Time (m:s)	*r* = .784
Total SCT	
# instances	*r* = .980
Time (m:s)	*r* = .936

Relationship between within-panel score converge & between-panel score divergence:

***r* = –.606** (*p* = .005)