

**Appeal of Decision on
NSERC Grant Application No. 193612-2010
“Likelihood based theory for applications”**

I write to appeal the decision on Grant Application 193612 on the grounds of **error and procedural unfairness in the review process.**

My application Fraser 193612-2010 together with the closely related application Reid 9436-2010 provides the central evidence for this appeal. As background on the appropriateness of citing the second application I note that we are husband and wife and are both fully cognizant of the two applications, of their form of presentation, and of this appeal, and are both fully committed to statistics in Canada and internationally. We both work in the core of statistical theory on crucial and innovative advancements of higher order likelihood theory, and individually have research areas supportive to that core theory, areas which broaden the basis of the theory or clarify the interface with two current methodologies dominant in statistics. My application was rated as Very Strong, Strong, and Very Strong, and Reid’s application was rated as Excellent, Outstanding, and Outstanding, respectively, in the three categories Excellence of the researcher, Merit of the proposal, and Training of HQP. This large discrepancy seems incorrect in light of the details recorded below.

Under Excellence of the Researcher I received a rating of Very Strong and Reid received a rating of Excellent. In the past 6 years I have published 32 articles in refereed journals, including flagship journals such as *Biometrika*, *Statistica Sinica*, *Journal of Econometrics* and *Statistical Science*. Reid lists 21 articles in refereed journals; twelve of the articles are joint with me. I have given 31 presentations; Reid’s application lists 8 presentations. Reid’s application lists various honours in the past 6 years; several of these are unavailable to me as I have won equivalent awards in earlier years. The discrepancy between a rating of Very Strong for me and Excellent for Reid does not seem correct in light of the information in the applications.

Under Merit of the Proposal, I received a rating of Strong and Reid received a rating of Outstanding. My proposal records **7** research directions in core statistical theory: 1) Parameter curvature via continuity; 2) Model-data combination; 3) Parameter curvature via asymptotics. 4) Conditioning via independence; 5) Directional assessment; 6) Second order location-exponential equivalence; 7) Discrete and quantitative data. The Forms 100 and 101 show a track record in each of these 7 directions and give clear indications of the fruitfulness of each proposed direction. Reid’s proposal (R) records **3** research directions: 1) Discrete and quantitative data; 2) Mean Likelihood; 3) Composite likelihood. The first two represent areas of past and proposed research joint with me and our colleagues and students. We have also worked together on other directions in core theory and expect to continue. Much of the remainder of Reid’s proposal records how particular directions of research are being examined as part of HQP, whereas my proposal puts this information in the HQP section of the Form 100.

The evaluation of the proposal is arguably the most subjective aspect of the review process, and I believe that errors in assessment would more easily have occurred with my proposal. I have been very active and blunt in writing that the use of many Bayesian methods in statistics is unjustifiable by statistical theory and foundations, and this runs counter to much current thinking in the discipline. Thus while my referee reports are generally positive, unusual care would be required to

correctly evaluate the proposal, as the opportunity for conscious or unconscious bias to influence the evaluation of the proposal is larger than usual. For example, the referee reports mention ‘classical’ and age-related development that puts inappropriate color on the proposed research while not mentioning that Bayesian inference is much older than ‘classical direction(s)’ or that the higher order likelihood themes that I am researching and developing are much newer than the ‘classical direction(s)’.

Under Training of HQP I received a rating of Very Strong while Reid received a rating of Outstanding. My Form 100 indicates that I was involved in supervision of 18 HQP over the past 6 years, and lists 12 publications co-authored with HQP. Reid’s application shows 21 HQP supported: this discrepancy in rating seems incorrect.

Appendix. Details: Applications 193612 and 9436

Publications: The first application Fraser (F) has **32** refereed articles (#31 not used, #34 included); the second application Reid (R) has **21** refereed articles (plus 2 omitted).

The articles for F and R include **12** articles in common; the common articles have numbers (F, R) on the Forms 100 and are recorded as (16, 7) (15, 8) (2, 3) (5, 15) (3, 4) (20, 10) (28, 14) (23, 21) (26, omitted) (29, 19) (27, 20) (32, omitted). The researchers work together on core statistical theory, primarily large sample asymptotics that has evolved largely from their contributions and gives high accuracy to approximations, provides definitive separation of interest parameters, and achieves the elimination of nuisance parameters: all widely unavailable from older theory and of the essence in the new theory.

In addition F has **20** articles (some joint), **12** in core theory and **8** in extensions and applications; these include **5** in *Biometrika*, *Bernoulli*, *Statistica Sinica* and *Statistical Science*. In addition R has **11** articles (some joint), **5** in core theory and **6** in extensions and applications: these include **4** in *Biometrika*, *Annals of Statistics*, and *Statistica Sinica*.

Training of HQP: The Forms 100 record numbers of HQP over the current and six past years. The totals are **18** for the first application (F) and **21** for the second application (R). If the Undergraduates are omitted, the numbers are **16** for the first application (F) and **14** for the second application (R). Any deemed HQP difference in indicator would thus be negligible and inconsequential.