

SIMON FRASER UNIVERSITY

S.03-21

Senate Committee on University Priorities Memorandum

TO: Senate

FROM: John Waterhouse
Chair, SCUP
Vice President, Academic

RE: Centre for Research on Adaptive
Behaviour in Economics (CRABE)

DATE: January 10, 2003

Attached is the proposal for the establishment of the Centre for Research on Adaptive Behaviour in Economics submitted for consideration by Dr. John Pierce, Dean of Arts. This will be a Schedule A Centre reporting to the Dean of Arts in accordance with Policy R 40.01.

The Senate Committee on University Priorities reviewed the proposal at its January 8, 2003 meeting. The proposal was unanimously approved. Once approved by Senate, the proposal will be submitted to the Board of Governors.

Motion:

That Senate approve and recommend to the Board of Governors the establishment of the Centre for Research on Adaptive Behaviour in Economics as outlined in document S.03-21

encl.

- c. J. Arifovic, Department of Economics
B. Clayman, VP Research
J. Pierce, Dean, Faculty of Arts

SIMON FRASER UNIVERSITY

MEMORANDUM
OFFICE OF VICE-PRESIDENT, RESEARCH

TO: Laurie Summers, Secretary
Senate Committee on University
Planning (SCUP)

FROM: Bruce P. Clayman
Vice-President, Research

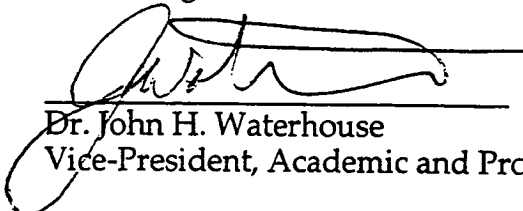
RE: Centre for Research on Adaptive
Behaviour in Economics (CRABE)

DATE: December 9, 2002

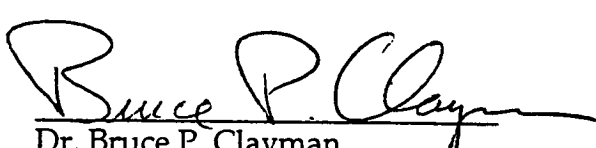
Attached is a proposal from Dr. Roger Blackman, Acting Dean of Arts, for the establishment of a Centre for Research on Adaptive Behaviour in Economics (CRABE) as a Schedule A Centre.

The Governing Committee for Centres and Institutes recommends that the Centre be granted approval by SCUP. Once approved by SCUP, the proposal is to be forwarded to Senate, followed by submission to the Board of Governors.

Governing Committee:



Dr. John H. Waterhouse
Vice-President, Academic and Provost



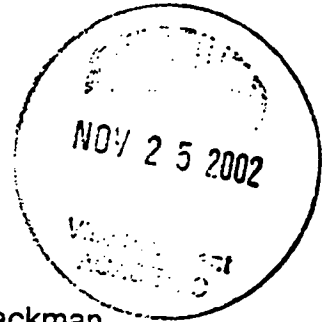
Dr. Bruce P. Clayman
Vice-President, Research

Attachment

C: J. Arifovic, Director, Centre for Research on Adaptive Behaviour in Economics in
the Department of Economics (CRABE)

SIMON FRASER UNIVERSITY
Office of the Dean, Faculty of Arts

M E M O R A N D U M



To: John Waterhouse
Vice-President Academic

From: Roger Blackman
Acting Dean of Arts

Subject: CRABE: Schedule A Centre
recommendation

Date: November 15, 2002

This proposal for a **Centre for Research on Adaptive Behaviour in Economics** has my enthusiastic support. Spearheaded by Dr. Jasmina Arifovic and with the active involvement of several of her colleagues in the Department of Economics, the prospects offered by CRABE have stimulated faculty members' interest in disciplines as varied as biology, business, computing science, linguistics, philosophy and psychology. What has captured their imagination is the potential for research into experimental and behavioural economics that focuses on the way people learn, adapt and evolve in economic environments. The awarding of a share of the 2002 Nobel Prize in Economics to Daniel Kahneman for relatively contemporary research based on his "integrated insights from psychological research into economic science" suggests that the time is right for these sorts of investigations.

For a Centre with what might seem like a specialized focus, CRABE will have interests in common with surprising number of existing research clusters at SFU, including the Behavioural Ecology Research Group, the Centre for Public Policy Research, the Computational Linguistics Research Group, the Evolutionary Psychology Research Group, and the Intelligent Systems Laboratory. Moreover, although there is only one other clearly identified Canadian research centre in this field (at McMaster), CRABE will have cognate organizations at several of the top universities in the U.S. and Europe.

With a relatively modest investment of resources, CRABE holds the promise of harnessing a significant portion of our faculty members' intellectual efforts and applying them to an academically ripe and socially important field of investigation. I am providing CRABE with a start-up grant of \$8,000 to be matched separately by both the Economics Department and Dr. Arifovic. That will cover the initial Research Assistant and computer hardware/software needs

CC: Dr. Jasmina Arifovic, Department of Economics
Greg Dow, Chair, Department of Economics

AR Blackman

SIMON FRASER UNIVERSITY

DEPARTMENT OF ECONOMICS
WEST MALL COMPLEX



Received by
DEC 6 - 2002

Vice President Research Office

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December 2, 2002

To: Bruce Clayman
Vice President, Research

From: Greg Dow
Chair, Department of Economics

Re: Centre for Research on Adaptive Behavior in Economics

In response to your recent inquiry, this is to confirm that the proposed Centre for Research on Adaptive Behavior in Economics will have no budgetary implications for the university beyond \$8000 in start up funding from the Dean of Arts office in the first year.

This amount will be matched by the Department of Economics as well as the acting director Jasmina Arifovic through a research grant, for a total of \$24,000 in start up funds for staff support and computer equipment.

CRABE will be housed within the Department of Economics and will use the department's computer lab to conduct experiments involving human subjects, unless alternative facilities can be financed externally. All other funding will be from external sources.

Please let me know if you have further questions concerning CRABE.

cc: Jasmina Arifovic
Roger Blackman
Valerie Murdoch ✓
John Waterhouse

W.A.C. Bennett Library
Simon Fraser University
Memorandum

To: Val Murdoch, Administrative Assistant
Office of the Vice President, Research

From: Gwen Bird *GB*
Head, Collections Management
gbird@sfu.ca

Subject: Library Report for the Proposed Centre for
Public Policy Research

Date: December 9, 2002

Cc: Lynn Copeland, University Librarian
Mark Bodnar, Liaison Librarian for Economics

Here is the Library's report regarding the proposed Centre for Research on Adaptive Behaviour in Economics (CRABE). I have reviewed the proposal for the above named Centre and am satisfied that the Library can support the Centre at this time. Our collection of monographs on subjects relating to activities of the Centre is strong, with at least as good coverage as the library collection at McMaster University, mentioned in the proposal as the only similar Canadian site. The following Library of Congress Subject Headings reveal good coverage, including a significant proportion of recently published titles:

- Rational choice theory (32 titles)
- Economics – Psychological aspects (50)
- Economics – Simulation methods (4)
- Consumer behavior (159)
- Consumers – Psychology (8)

We also have good coverage of books with the LCSH subheading "Economic aspects" following many relevant subject headings.

In addition to our strong journals collections in both Economics and Psychology, and our online access to the primary indexes of Economics (Econlit) and Psychology (PsycInfo), we have current subscriptions to the following journals:

- Journal of Socio-Economics*
- Experimental Economics*
- Journal of consumer psychology*
- Journal of Business & Psychology*

Although there are no outstanding Library issues at this time, there may be future hiring of faculty with interests outside the current scope of the Centre for Public Policy Research. When hiring such individuals it is important to note the compatibility of their research interests with existing library resources. If a mismatch is determined and new resources are required the Centre will have to provide funding to purchase such library resources. This is a general concern regarding new hires and not specific to the Centre for Public Policy Research.

Costs:

THERE ARE NO ADDITIONAL LIBRARY COSTS ASSOCIATED WITH THIS CENTRE.

If you have any questions regarding this assessment, please don't hesitate to contact me by phone (3263) or by email, gbird@sfu.ca

To: John Pierce, Dean of Arts
From: Jasmina Arifovic, Director
Re: Centre for Research on Adaptive Behaviour in Economics (CRABE)

Date: May 14, 2002

This is an application for the establishment of the Centre for Research on Adaptive Behaviour in Economics in the Department of Economics.

Attached is a Constitution for the Centre, a description of the Centre's objectives (Terms of Reference), and a three-year plan. We have incorporated changes to the above documents suggested by you and VP Research, Bruce Clayman. We have also consulted with other SFU departments, research groups and centres that might be interested in collaborating with CRABE at various levels as well as with a number of individual faculty members in other departments that may be interested in CRABE's activities.

As a result of these consultations, we have identified research groups and individual faculty who are interested in developing linkages with the Centre's activities. We have accordingly revised our Terms of Reference to reflect this potential.

The faculty of the Department of Economics involved with the Centre's activities are Jasmina Arifovic, Lawrence Boland, John Chant, Gregory Dow, Stephen Easton, Jane Friesen, Anita Gantner, Robert Jones, Kenneth Kasa, Jack Knetsch, Brian Krauth, Steeve Mongrain, Gordon Myers, Nancy Olewiler, and Krishna Pendakur.

Until the Centre is formally approved, the members of the ad hoc Steering Committee are: Jasmina Arifovic, Kenneth Kasa, Jack Knetsch, Steeve Mongrain, Gordon Myers, Nancy Olewiler and Gregory Dow. The members of the ad hoc Steering Committee have proposed Jasmina Arifovic as the director of the Centre.

According to the Constitution of the Centre, once it is formally approved, the Centre's official Steering Committee will consist of three members of the SFU Department of Economics and two SFU faculty members from cognate disciplines, plus the Director of the Centre, and the chair of the Department of Economics as an ex officio member.

The following people have agreed to serve on the Steering Committee once formal approval for the Centre is granted: Jasmina Arifovic (economics) as Director, Anita Gantner (economics), Kenneth Kasa (economics), Jack Knetsch (economics and natural resources), William Havens (computing science), Paul McFetridge (linguistics), and Gregory Dow (economics), Chair of the Department of Economics as ex officio member.

The Centre's Associate members within the University are: Michael Brydon (business), Charles Crawford (psychology), Lawrence Dill (biology), Andrey Pavlov (business), Bernard Roiteberg (biology), and Oliver Schulte (computing science and philosophy).

We are also working on identifying researchers from other universities whose interests overlap with the Centre's activities and who might be interested in being involved as Associate Members.

Best regards,

Jasmina Arifovic
Jasmina Arifovic

CENTRE FOR RESEARCH ON ADAPTIVE BEHAVIOUR IN ECONOMICS

Constitution

1. Objectives

The activities and the program of the Centre for Research on Adaptive Behaviour in Economics are intended to initiate and promote research related to experimental and behavioural economics, and computational methods for the study of learning, adaptation and evolution in economic environments. The centre will facilitate the conduct of faculty and student research projects by providing infrastructure for computer simulations, economic experiments with human subjects and survey studies. The Centre will also organise conferences, colloquia, visiting speakers' seminar series and visiting scholars' programmes.

2. Administration

2a The Centre for Research on Adaptive Behaviour in Economics shall be governed in accordance with University Policies including R.40.01, CENTRES AND INSTITUTES. If this document and University policy differ on any issue, University policy shall prevail.

2b The Centre for Research on Adaptive Behaviour in Economics is a Schedule A Centre (R.40.01, page 2) and comes under the direct authority of the Dean of Arts.

2c The Centre for Research on Adaptive Behaviour in Economics is housed in the Department of Economics.

3. Appointment of Directors

3a The Director of the Centre shall be appointed by the Dean of Arts on the recommendation of the Centre's Steering Committee. The term of office shall normally be for three years.

3b In the absence of the Director, an Acting Director may be drawn from the Centre's Steering Committee.

4. Internal Governing Procedure

4a The Centre shall be governed by a seven person Steering Committee made up of three members from the faculty of the SFU Department of Economics and two SFU faculty members from cognate disciplines, plus

the Director of the Centre with the chair of the Department of Economics as an ex officio member. Members of the Steering Committee will be appointed by the Dean of Arts with the advice of the Director. Appointments shall be for a three-year term.

- 4b The Steering Committee shall be chaired by the Director of the Centre. Meetings will normally take place once a month.

5. Associate Members

The Centre shall consist of a body of interested associates from both within, and outside of, the University community, as well as individuals linked to the Centre through the projects and other activities it sponsors and supports. Associate member status is proposed by the Director and approved by the Steering Committee.

CENTRE FOR RESEARCH ON ADAPTIVE BEHAVIOUR IN ECONOMICS

Terms of Reference

The Centre for Research on Adaptive Behaviour in Economics (CRABE) will provide a focal point for faculty and students interested in experimental and behavioural economics, processes of learning and evolution in various economic environments, and computational methods for modeling such processes. Housed in the Department of Economics, CRABE will establish and maintain facilities, materials, personnel, and other resources dedicated to the exploration of adaptive behaviour in economics.

Researchers from cognate disciplines such as computer science, philosophy, psychology, cognitive science, linguistics, business, biology, and mathematics will be encouraged to participate in the activities of the Centre.

The Centre's initial objectives are:

- To conduct research on adaptive behaviour in economics and related disciplines
- To develop suitable courses in economics to train undergraduate and graduate students and serve as a teaching resource for other programs such as the Master's in Public Policy (MPP)
- To raise funding to attract doctoral and postdoctoral students interested in adaptive behaviour in economics
- To develop linkages with other research centres and groups at Simon Fraser University, for example, Behavioural Ecology Research Group (BERG), Centre for Public Policy Research (CPPR), Computational Linguistics Research Group, Evolutionary Psychology Research Group, Intelligent Systems Lab
- To coordinate and host conferences, and publish conference proceedings
- To organise workshops, and invite and host visiting speakers, scholars and researchers
- To develop formal models of learning and evolutionary dynamics relevant for game theory, mechanism design, organisation theory, macroeconomics, labour economics, finance, and other fields
- To develop software for the conduct of experiments with human subjects in various economic environments
- To develop commercial software for testing economic models under various behavioural assumptions, using both experiments with human subjects and computer simulations.

Adaptive Behaviour in Economics

The foundations of modern economic theory are based on the hypothesis that economic agents are rational, with full understanding of their environment and in particular of the stochastic processes governing the behaviour of key exogenous and endogenous variables. Given this understanding of the environment, agents formulate optimal

decisions in order to pursue their own welfare. To perform these calculations, agents need a sophisticated knowledge of various mathematical and statistical methods (e.g. dynamic programming in stochastic environments, intertemporal optimisation, taking mathematical expectations in complicated environments, etc.). Using this *rational expectations hypothesis*, researchers have made important advances both theoretically and in practice.

Despite its wide acceptance in economics, the rational expectations hypothesis continues to be controversial. Many researchers believe that it rests on implausible informational assumptions. As an alternative, models of learning and adaptive behaviour have gained in importance over the last decade. These models depart from traditional economic theory by assuming that economic agents are boundedly rational (to varying degrees). Further, they assume that economies are inhabited by heterogeneous, interacting agents who learn about their environment, update their beliefs and strategies, and make economic decisions. This updating of individual beliefs and the resulting decisions in turn affects economic outcomes. Usually, the interactions between agents and economic environment result in non-linear self-referential systems with complex and interesting dynamics.

These models have been able to capture important features of the behaviour observed in experimental laboratories with human subjects which are not accounted for in traditional theory. In addition, these models can explain some empirical facts about economic time series that again traditional theory cannot account for. Moreover, experimental data can be used to test competing hypotheses and models of agents' learning, and to narrow the class of plausible algorithms.

Models of adaptive behaviour can provide computer testbeds for a thorough search over the space of parameters that are relevant for the model's performance. Using experiments with human subjects to study these effects is often prohibitively expensive in monetary and time resources. Computer testbeds are not only significant in themselves but they can provide a way to sort out what the most important experiments might be.

Experimental economics has found increasing use in exploring issues such as how people react to different market or auction rules, their choices under uncertainty, and the relative efficiency of alternative market and non-market allocative institutions. Results have been used, for example, to determine allocation of airport 'slots,' to improve rules of securities exchanges, and to design auctions for awards of communication channels.

Behavioural economics grew out of the interests of market researchers, cognitive scientists and social psychologists. While much of this work has been carried out using experiments, behavioural economics also uses other research methods such as survey techniques. Some of the most prominent findings have raised serious questions about traditional behavioural assumptions in economics. Results from behavioural economics are also being applied in finance and law, and have been shown to be important for environmental issues.

All of this research has grown rapidly during the past decade. A strong complementarity among these areas has also developed. For example, it has become common practice to

test theoretical models of individual behaviour through experiments with human subjects. In turn, the results from experiments with human subjects have guided the direction of subsequent theoretical research in economics.

The Need for the Centre

To our knowledge there are only three centres worldwide which are organised to exploit the complementarity between experimental and behavioural economics, on the one hand, and the study of learning and evolution in economic environments, on the other. These are: the Institute for Empirical Research in Economics, University of Zurich; the ESRC Centre for Economic Learning and Social Evolution at the University College of London; and the Computable and Experimental Economics Laboratory at the University of Trento.

There are a number of centres for experimental economics worldwide. These include one in Canada, the McMaster Experimental Laboratory. There are also at least four centres for computational social science in the U.S. (Carnegie-Mellon University, University of California at Los Angeles, University of Michigan at Ann Arbor, University of Wisconsin at Madison). To our knowledge, no North American centre combines experimental work with research on computational methods.

In addition to academic research, there is considerable scope for collaborative work with private companies interested in applying the results of experiments with human subjects, as well as computer simulations based on behavioural models. An example involves those companies interested in carrying out trading and auctions through the Internet.

Finally, linkages that will be developed between CRABE and the proposed Centre for Public Policy Research, as well as the teaching program leading to a Master's in Public Policy. CRABE would create an environment for teaching and research not duplicated by other graduate public policy programs in Canada. One potential linkage involves environmental policy analysis, where behavioural and experimental economics come into play in at least two ways: simulating the actions of market participants, and eliciting information about individual preferences in situations where markets do not exist.

In summary, the Centre would fill an important niche and enhance the international reputation of the University, making it a world leader in this field of research.

Revision of These Terms

The Centre for Research on Adaptive Behaviour in Economics will revisit, revise and re-endorse these Terms of Reference on an annual basis, or more frequently upon election.

Structure, Membership, and Governance of the Centre

The Centre for Research on Adaptive Behaviour in Economics will be housed in the Department of Economics, Faculty of Arts, at Simon Fraser University. The Centre will

be administered by a Steering Committee made up of three members of the Department of Economics and two SFU faculty members from cognate disciplines, each to be appointed by the Dean of Arts for a term of three years, plus a Director, with the chair of the Department of Economics serving on the Committee in an ex officio capacity. The Dean upon recommendation by the Steering Committee will appoint the Director of the Centre.

The Centre will also appoint a number of Associate members from both within, and outside of, the University community, as well as individuals from government and the private sector who will be linked to the Centre through the projects and other activities it sponsors and supports. Associate member status is proposed by the Director and approved by the Steering Committee.

CENTRE FOR RESEARCH ON ADAPTIVE ECONOMIC BEHAVIOR

Three Year Plan

Plan: 2002– 2005

A three-phase plan will guide the Centre's initial development.

Phase One:

January 2002 - January 2003

Preparation of proposals for funding from government and private sources.

Initiation of the activities related to development of software for experiments with human subjects and for computer simulations.

An undergraduate class in behavioural economics taught in the spring and fall of 2002.

Seminar series starting September 2002.

Preparation for the first conference that the Centre would organise.

Further exploration of possibilities for internal and external collaborative research.

Phase Two

January 2003 - January 2004

The Centre organises a conference on adaptive behaviour in economics in the spring of 2003.

The Centre's visiting scholars' program begins.

First graduate class in experimental economics taught in the fall of 2003.

First graduate class in modelling of adaptive behaviour taught in the spring of 2004.

Development of software for particular applications in experimental economics and modelling of adaptive behaviour.

Exploration of private sector interest in software or services the Centre could provide.

Phase Three

January 2004 – January 2005

The Centre publishes proceedings from its first conference.

The Centre organises a second conference.

Other activities continue as described above.