

Readers' Comments to the New Researchers' Committee Report

Abstract. When the report by the New Researchers' Committee (NRC) of the IMS was published in *Statistical Science* (6 163–174), readers were invited to provide additional comments. We publish here commentaries by four individuals and also two invited discussions about programs at the National Science Foundation and the National Security Agency designed to benefit new researchers (NR's).

The original report by the New Researchers' Committee provides suggestions for NR's and covers the role of the IMS as an advocate for them. The new NRC, now chaired by Deborah Nolan, responds to these comments adding some new material. The NRC also recently has published the *New Researcher's Survival Guide* to help the professional development of NR's.

Key words and phrases: Publication, refereeing, grant applications, National Science Foundation, National Security Agency.

SECTION 1. COMMENTS FROM FUNDING AGENCIES

At the request of the New Researchers' Committee, Dr. Peter Arzberger of the National Science Foundation and Dr. James A. Maar of the National Security Agency provided information about programs in their agencies that would benefit new researchers.

Comment from the National Science Foundation

Judith Sunley, Peter Arzberger, Keith Crank and Nell Sedransk

The National Science Foundation (NSF) applauds the IMS for taking a look at the very important issue of improvement and retention of new researchers in the statistical sciences. How IMS responds may be a model for other areas of the mathematical sciences.

WHAT IS NSF DOING?

Research support for new researchers is of high priority foundation-wide at NSF, and expressly so within the Division of Mathematical Sciences (DMS). New researchers receive NSF support both directly through research awards, in targeted programs, in general programs, via awards to institutes and to groups and

also indirectly through priorities set on the use of conference and workshop funds for activities directed toward new researchers. Some of these are familiar aspects of NSF-sponsored research; others are programs which have not been widely used by new researchers in statistics.

Research Awards

In the past few years, DMS has been successful in obtaining incremental funds for new investigators, and in using these to make awards to strong proposals from new researchers. Admittedly, these funds do not go as far in supporting new young investigators as might be desired. However, DMS at NSF has a continuing commitment to the support of new researchers, a commitment staunchly supported by the Statistics and Probability program. Thus in FY91 (October 1990–September 1991), the “success rate” for new researchers in obtaining some summer salary support was better than one-third. While the success rate for established

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investigators appears to be slightly higher, this includes a group of senior researchers whose awards did *not* include salary support for them.

It is worth pointing out that the funding levels for the disciplinary programs within DMS have been fairly level in real terms over the last 3–4 years, and within the context of the federal budget picture this is the likely scenario for the foreseeable future. Thus, we are faced with the need to do more with less in available resources (factoring in inflation).

DMS has been discussing and is moving toward new approaches for funding research proposals. One important fact often lost in this discussion is that DMS does not live in a vacuum at NSF. We function within the broader environment of NSF (i.e., how business is conducted in chemistry, biology or engineering). DMS encourages informative input from the community to help us in articulating the community's needs within NSF.

For example, as new paradigms for funding are suggested we welcome the views of the community in identifying the critical items for support. (There is no required budgetary form such as 2 months' summer salary plus travel plus computing plus miscellaneous cost, although this has been habitual in the past. Well-presented proposals for more effective patterns of support are enthusiastically received right now.)

Mentoring Awards and Grants for Focused Workshops

One "new type" of grant request, with examples currently supported, is designed specifically to bring new researchers to work with established investigators, usually during the summer. These proposals have originated spontaneously in the research community and have focused particularly on new researchers and on members of underrepresented groups, on researchers in small academic institutions (with or without graduate programs) or on other new researchers who could particularly benefit from establishing such connections. Requests have included support for intensive workshops of a couple of weeks or more, sometimes including summer salary support for the new researchers but minimal (if any) direct support for the established investigators. The keys here are the commitment of the senior researcher(s) to the mentoring aspect of the proposal and the opportunities for professional growth afforded the new researchers. Some of the institutes' activities have similar goals.

Post-Doctoral Fellowships and Other Activities

One unusual program, Mathematical Sciences Post-Doctoral Research Fellowships (MSPRF), offers awards which are given to the Post-Doctoral Fellow, *not* to the institution so that it is the new researcher's choice of institution and of mentor(s). A MSPRF pro-

vides a stipend for the 2 years plus three summers of the award, usually soon after receipt of a Ph.D. The intent is to allow a new researcher to enlarge his or her research perspective under a different mentorship than his or her graduate experience. (The host institution may augment the stipend.)

Participation by statisticians in this program has been inexplicably poor. The mathematical sciences community more generally has viewed the MSPRF program very positively and is enthusiastic about its expansion. Needless to say, if there are few or mostly inappropriate applicants from statistics, few of these fellowships will be awarded in this discipline.

There are also other mechanisms for support by NSF than the regular research proposal. Many of these go unnoticed by most researchers (for reasons that escape us). Details of these appear in the brochure "Opportunities in the Mathematical Sciences." Often these special programs have deadlines and specific requirements which differ from ordinary research proposals, so it is worthwhile to consult a program officer about these after reading the brochure.

We would like to draw your attention to several of these opportunities now. There are NSF/NATO Post-doctoral Fellowships; there are opportunities for Research at Undergraduate Institutions (RUI). For women there are Research Planning Grants (RPG) and Research Initiation Considerations for Women (RIC); for members of underrepresented ethnic groups, there are Minority Research Initiation Awards (MRI) which include both planning grants and research initiation awards. Of course, the Facilitation Awards for Handicapped Scientists (FAH) program is open to applications for specialized equipment and assistance from new researchers.

For the MSPRF post-doctoral opportunities, in particular, the strongest cases are made by new researchers who seek to expand their horizons. Thus, it is generally the rule that mentors are *not* the post-docs' dissertation advisors, the host institutions are *not* their alma maters, and most often the opportunities for growth differ from the strengths of the institutions where they studied. Occasional exceptions are found, as, for example, when "expanding the horizon" means interdisciplinary development and concentrated work in a second department at the same institution.

More widely publicized for truly outstanding new researchers are the Presidential Faculty Fellows (PFF) and the NSF Young Investigators (NYI) programs which have foundation-wide competitions.

Cross-Disciplinary Research

Cross-disciplinary research offers unique opportunities to contribute to progress in several disciplines, including statistics and probability. Statistics was born through questions in other fields, from astronomy

to biology, and these offer a wealth of rewarding research topics. This case has been stated repeatedly in reports and articles, for example, "IMS Panel Report on Cross-Disciplinary Research" (*Statist. Sci.* 5 121-146), "Report on Cross-Disciplinary Activities" (*IMS Bulletin* 16 716-719) and "Looking Ahead: Cross-Disciplinary Opportunities for Statistics" (*Amer. Statist.* 44 121-125). Furthermore, other disciplines have recognized the need for mathematical and computational sciences to be involved in their problems.

Currently, there are several mechanisms available to new researchers for support in cross-disciplinary research. The mechanisms mentioned elsewhere, for example, RPG, MSPRF or post-docs at institutes or centers, are all open to interdisciplinary proposals. Joint research proposals with collaborators in other disciplines can provide direct support both as post-docs with mentorship and as investigators in their own rights. One unique opportunity involves an NSF-funded associate fellowship at the National Institute of Standards and Technology (NIST).

In modern science a significant portion of the important outstanding problems will be faced by groups of investigators from different backgrounds. Many such problems require statistical expertise. NSF recognizes this need and will continue to encourage active collaborations (not just consultations) between scientists in substantive areas and mathematical scientists. One activity that has been undertaken is the Collaborative Research in Geosciences, Geography and Mathematical Sciences, which helps form collaborative teams. Other activities that would build collaborations at the post-doctoral level are envisioned, and some opportunities are even now in place in the interface with molecular biology.

Conferences and Workshops

Currently, we encourage conference proposers to involve new researchers, and we give priority to the support of new researchers and graduate students for travel and participation in conferences. Moreover, the general guidelines which are used in arriving at funding priorities reflect the general NSF policy to support "conference proposals which contribute to the Foundation's effort to enlarge the science personnel base of the nation by including (where feasible) students and recent doctoral recipients, women, minorities and persons with disabilities among invited speakers and/or participants."

Yet, it is amazing that many individuals who write proposals for conferences are unaware of this point. It would be a valuable contribution of the IMS to make this point to its community.

As a final note, in this regard, since the conference organizers are the awardees, they distribute the travel

and other funds, so new researchers should actively pursue financial support directly from organizers of conferences. They are usually listed in the *IMS Bulletin*.

Proposals that Support the Infrastructure for New Investigators

We also have encouraged and supported innovative proposals to help integrate new researchers into the research community. Two particular examples of that are the "Pathways to the Future Workshop," run by Lynne Billard, and a recent writing workshop, organized by Bill Strawderman. By all accounts, both of these workshops have been tremendously successful. The evident effectiveness of these activities is the basis for their continuation.

The "Pathways to the Future Workshop" has been held in conjunction with national meetings for the past 4 years. It is aimed at networking women investigators in order to improve their research connections and in order to increase their involvement in professional roles related to research.

The "Writing Workshop for New Researchers" was held for the first time in August 1991. This workshop and tutorial brought together new researchers seeking to publish their work and experienced journal editors both for general sessions addressing fundamental issues of technical writing in statistics and probability and for individual consultations critiquing and revising drafts for research papers.

Through the Association for Women in Mathematics, there are also travel grant opportunities for women researchers.

Institutes, Centers and Groups

There are also many avenues of support that are available to new researchers at NSF-supported institutes, centers and groups. In particular, two institutes [Mathematical Sciences Research Institute (MSRI), located in Berkeley, California, and the Institute for Mathematics and Its Applications (IMA), located in Minneapolis, Minnesota] offer workshops and years of emphasis. Managed by the institutes directly, all of these activities support both brief and extended visits by young researchers to the institutes. These activities allow new researchers to meet senior researchers in the field as well as to learn the latest discoveries.

In addition there are smaller centers and groups, supported by NSF, which have some funds for visitors. Please see a current awards list for more details on these activities.

Other Agencies

The National Security Agency has an award program which does fund researchers in Statistics and Probability. They have recently introduced a program for new

researchers, which we hope will be very successful. Other agencies, as well, are alert to the needs of young researchers and take cognizance of their status.

WHAT CAN NSF DO?

We would like to challenge the community to think of innovative training experiences involving graduate students and new researchers. Within DMS we are looking for new ways to enhance the research health of the mathematical sciences through the support of research, conferences, mentoring or the building of the human resource base. We would urge potential applicants not to be bound by what has been done before (by imagining that is all that NSF is interested in). Rather propose something that you feel will address the need to involve new researchers in activities in ways that may not have been attempted before. If you are uncertain about NSF's interest in a new activity, contact the program officers to discuss its feasibility.

While NSF can challenge the community, we react to the proposals we have. Thus, we encourage a dynamic dialogue with the community on priorities for the health of the mathematical sciences community. We have an advisory committee, which consists of 15 individuals. The two members from the statistics and probability community are Lynne Billard at the University of Georgia and Terry Speed at the University of California at Berkeley. Feel free to contact us or them about your concerns and possible suggestions.

WHAT CAN THE COMMUNITY (NEW RESEARCHERS) DO?

It is always worthwhile to understand the system within which you work. Since funding is of increasing importance and is simultaneously increasingly difficult to obtain, it is even more important to understand the

system and the people who work in that system, that is, the program officers.

Moreover, it is worth knowing the interests of other funding agencies (Air Force Office of Scientific Research—AFOSR; Army Research Office—ARO; Office of Naval Research—ONR) that have specified missions or that have programs for new researchers, as is the case with the National Security Agency (NSA). Of course, depending on the nature of your research, there are other agencies as well (National Institutes of Health, United States Department of Agriculture, Department of Energy).

In all of these cases, the research objectives and plan must be communicated in writing clearly and effectively. The reviewers will have nothing beyond the written proposal on which to base judgment. Perhaps more writing workshops are needed.

One of the opportunities to learn about the system and the expectations of reviewers and program directors is to review proposals in your own area of research. If you have not been asked to review a proposal, you may write to the program directors indicating your interest and your area(s) of expertise; for recent Ph.D.'s, including a c.v. is often useful.

Finally, in terms of getting to know the systems of proposal handling, the article by Bruce Trumbo, a former program officer of the Statistics and Probability Program, which appeared in *Statistical Science*, "How to Get Your First Research Award" (4 121-150), is well worth reading, several times.

A FUTURE ACTIVITY

The program officers of several of the funding agencies including NSF are planning a session specifically for new researchers at the annual meeting of the IMS in Boston in August 1992. We hope to meet with many of you at that time.

Comment from the National Security Agency

James R. Maar

The National Security Agency (NSA) would like new researchers in statistics and in all branches of mathematics to be aware of three programs of particular interest to them.

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1. The new funding category in our NSA Mathematical Sciences Grants Program called "The Young Investigators Grant"
2. Our separate funding opportunities for researchers at Historically Black Colleges and Universities and other Minority Institutions (HBCU/MI)
3. Permanent and Temporary Employment Possibilities for mathematicians in general

First, "The Young Investigators Grant" began on 15 October 1991 and was formulated specifically to give the new researchers an opportunity to begin their research careers. The purpose of this award is to provide young, promising investigators who have not yet received tenure with the equivalent of 2 months' summer salary each year for a period of 2 consecutive years. This new award category was begun by the previous NSA grants program director, Dr. Marvin Wunderlich, and the current director, Dr. Charles Osgood. Dr. Peter Arzberger of NSF was instrumental in conveying the need for a program that gives new researchers such an opportunity. The deadline for this category of grant, as with the other categories of NSA grants (except conference, workshops and special situations), is October 15.

The second and separate program of particular interest to new researchers at HBCU/MI is a grant and contract program that gives affirmative action to faculty proposals from such institutions. This is a federally mandated program by authority of two executive orders and a Department of Defense Authority Act. At NSA, an annual conference of department chairmen is held at which areas of NSA interest are described and interaction with NSA personnel is featured, including a small panel on mathematics chaired by our Chief of Mathematical Research, Dr. Richard Shaker. This program is only 3 years old and currently funds only a few researchers in mathematics, although 65 contracts or grants have been awarded in all fields (it also covers engineering, computer science, language, as well as other fields). The opportunity is there, new researcher!

Finally, new researchers should be aware that our agency is profoundly interested in mathematics and its health because we depend on the discipline for our health. We believe that we are the largest employer of mathematicians. We actively recruit on campus and at

mathematics conferences and participate at the national and local levels in improving the U.S. mathematics posture. We have been an Institutional Member of the IMS since 1957 and similarly support the ASA, AMS and the MAA. For *all* employment opportunities, U.S. Citizenship is a requirement. We have excellent jobs *actually doing* mathematics, and we not only hire new graduates and *new researchers* for permanent positions, but we have also employed a very limited number in summer positions.

Longer temporary positions for faculty, such as sabbaticals, exist as well. Sabbaticals can run from 9 to 24 months, and we are flexible regarding starting dates. NSA provides funding to the university that employs the applicant, in the same way the visited school complements the host school on academic salary. We are also excited about a very successful 2-year-old program for truly promising mathematicians at the upper undergraduate level in our "Director's Summer Program (DSP)." The DSP is run by our Mathematics Research Office, and candidates must be nominated by their faculty in the fall preceding the summer period of prospective employment.

Other future "new researchers" whom we help include outstanding women mathematics graduates who are nominated as "high potential Ph.D. candidates" for the National Physical Sciences Consortium (NPSC) Fellowships. These NPSC awards are made through a national program in which we participate and optional summer employment with NSA is available to qualified awardees of our choosing.

In summary, the National Security Agency is concerned with the health of the "new researcher" community and has responded with special grant opportunities, fellowships and employment possibilities. We appreciate Deborah Nolan's invitation for us to give this response to the cited article.

SECTION 2. COMMENTS FROM INDIVIDUALS

Comment

Michael R. Chernick

In reading this article in the May issue of *Statistical Science*, I was reminded of the experiences I had as a new researcher in the late 1970s. I basically agree with the suggestions the committee made and am particularly in favor of double-blind refereeing. As both an author and a referee, I see several good reasons why it would make the refereeing process more fair.

After graduating from the Stanford Statistics Department in 1978, I went to the Oak Ridge National Laboratory to do research on energy data and its validity. This provided me with an opportunity to undertake new research projects motivated by real problems. I also was encouraged to publish my dissertation work, which I eventually completed in three papers. I had the advantage of a research environment with several colleagues to collaborate with but did not suffer the disadvantage of the "publish or perish" pressure of a university position.

Being very impressionable and naive about the publishing and refereeing process, I was very sensitive to the harsh criticism I received from some referees of my early papers. I often went to the trouble of writing rebuttals. The criticism was often vague and related to the referee's subjective opinion as to the value of the research. This was particularly true with submissions to *The Annals of Probability*, where my main thesis result appeared.

New researchers can benefit from the suggestions of referees regarding better ways to present results,

including offering simpler proofs (if they are sure of their correctness), ways to make the exposition more direct and concise and additional relevant references from the literature. If the paper is publishable but not suitable for the submitted journal, the referee should offer advice regarding alternative journals. If the paper needs a major revision, the referee and the associate editor could suggest additional research which would make the paper more interesting and publishable. This type of guidance would be greatly appreciated by the new researcher, who can very often benefit from this expert direction that most referees can provide.

An obvious advantage of double-blind refereeing is that it removes the potential bias a referee might have when reviewing the work of an "unknown." It also would force referees to examine each submission with equal care. More importantly it might eliminate the very harsh, vague and unconstructive criticism that new researchers often face with submissions to highly selective journals such as the three major IMS journals.

On the other side, referees can be intimidated when a paper is authored or coauthored by a famous statistician. If the referee is a lesser known statistician, he or she may be timid in suggesting changes and may not recommend rejection even if there are clear weaknesses in the paper. Well-known senior researchers are as likely to make mathematical errors as are new researchers. In fact, because of their insight and experience, they sometimes may "handwave" a proof which really requires more care. Also, the new researcher may tend to be more careful due to lack of confidence while the senior researcher could make mistakes due to overconfidence.

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Comment

Cindy L. Christiansen

I found the two articles on research in the May issue of *Statistical Science*, Altman et al. (1991) and Kempthorne et al. (1991), to contain excellent advice and information. It is very helpful to have the opinions of both established and new researchers represented. I would like to expand on some of the ideas presented in these reports and to offer some suggestions of my own. Being a final year graduate student, my advice on doing research comes almost equally from two sources: observing and learning from others, and personal experiences.

Graduate students can do many things in preparation for their research careers. One thing I have found very useful is to prepare a vita during the first year of graduate school and update it at least twice yearly. When asking for recommendation letters, I give copies of my vita to the professors to help refresh their memory of my strong points, interests and accomplishments.

At the University of Texas at Austin campus, we started a Student of Statistics group to help, encourage and support graduate students working in statistics. This organization has provided many opportunities for students to learn about a wide range of research topics, usually from fellow students. It also provides opportunities for students to try out leadership and mentor roles.

Participating in applied collaborative research has been some of the most beneficial and interesting work I have done during my graduate school training. Students who are exposed to this are able to see the planning, the analysis and the iterative procedures that go into statistical research. Another benefit is learning to interact with professionals in other fields. Many times, new research ideas come from these real statistical problems.

It is a good idea for graduate students to join and to participate in professional societies. The news bulletins are invaluable for listings of employment and grant opportunities, conferences and abstract deadlines. Journals and conferences are excellent ways to stay abreast of current research. The journals also serve as a convenient source of information for connecting names with research areas. Conferences are even better for this. Students who interact well and feel confident

talking with others about their work will discover that attending statistical meetings is an enjoyable way to increase professional contacts. For at least the first few times, it helps to go to meetings with senior statisticians you know and to ask them to introduce you to some of their colleagues.

As the two *Statistical Science* articles point out, new researchers struggle with both written and oral presentations of their work. To improve writing skills, I have found it helpful to participate in article reviews and to look over the writings of fellow graduate students, especially those with whom I share an advisor and research topics. To improve oral presentations, I find it helpful to listen critically to others' talks. These processes help to drive home the general advice for communicating research material: be organized and be clear. For talks, it is also important to be audible, be time conscious and make sure anything one wants the audience to see is legible. Enthusiasm and eye contact with the listeners help to hold their attention. After my own presentations, I jot down what went well and what did not go well. If I have an honest friend in the audience, I ask for their feedback too. Before my next talk, a quick review of these notes reminds me of the advice they contain.

I like that the New Researchers' Report, Altman et al. (1991), encourages incorporation, not separation, of new researchers in conference sessions. I think it is a valid concern that special sessions for new researchers are not on equal footing with the regular and invited ones. However, my experience with chairing and organizing graduate student sessions indicates that many new speakers want the isolation that the special session affords. I think that for some, "special" opportunities for breaking into the system are welcomed events. Two suggestions are (1) offer the new researcher a choice (don't mandate isolation in a special session, yet continue to make it available), and (2) modify attitudes about special sessions by looking more closely at the important and new research being presented there.

Many new Ph.D.'s have difficulties with the transition of going from being a graduate student to becoming a professional. The best advice for this seems to be to practice professional roles and to accept many of these new responsibilities while still a student. Ways to practice professional roles include offering to help with article reviews, teaching, sharing one's expertise by giving talks and saying "yes" to most research opportunities. Graduate students can express their in-

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terest in doing these things, and professors can help by encouraging their students to participate in these ways.

My last few suggestions for a successful research career encompass ideas that Sen and Kempthorne expressed in the panel discussion (Kempthorne et al., 1991). They have to do with self-development and only indirectly with knowledge and research. Sen encourages students to "keep up with one's basic goals in life." Reflecting on this is always time well spent. Kempthorne says that when undertaking research, it

is very important to have "an open mind" and to "think for oneself." This is sage advice. And finally, sifting through the insights offered by others and keeping in mind what is right for one's own life is a valuable and well-rewarded skill for researchers at all levels.

REFERENCE

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Comment

Agnes M. Herzberg

In their article, "Meeting the Needs of New Statistical Researchers," the New Researchers' Committee has voiced some concerns. In particular, the paper brings out some issues in which most researchers have at one time or another been interested.

My comments are the following:

1. Editors and referees on the whole are willing to help any author; the young and minorities are not prejudiced against but helped.

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2. In order to see any effect of double-blind refereeing, a very large experiment would have to be undertaken.

3. Editors should, as a matter of course, edit the referee's comments.

4. The length of time taken by referees can only be changed by a change in attitude.

5. Any separate considerations for young research workers creates bias and will probably cause some sort of friction with the rest of the community because of the fear, rightly or wrongly, that standards are not being upheld. More experienced researchers and editors should certainly help inexperienced authors with presentation.

Comment

R. L. Tweedie

I enjoyed reading the report by the New Researchers' Committee (NRC) (*Statist. Sci.* 6 163–174), and all the more so because I found so often that the ideas I had jotted down as I read kept appearing, in better form, as I read on. The NRC is to be congratulated on doing such a thorough piece of work on a matter of concern to the profession at all levels.

From my experience in the Australian statistical community, there are three areas that I would specifi-

cally urge for vigorous follow-up: the funding of new researchers (NRs) at major meetings, which has been happening with funding supplied by the Statistical Society of Australia even at the predoctoral level for some years, and which has had some real impact on retaining graduates in the profession in Australia; the use of NRs as referees, which is an excellent approach to ensure that NRs become familiar with a wider range of research work than that of their own and their thesis supervisor's interests and the development of joint proposals with senior researchers, ensuring that the general run of NRs are not left to what are often poorly honed skills in picking research areas.

In the last area in particular, the IMS may be able

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to help by lobbying specifically for the funding of postdoctoral positions rather than merely funding for graduate students. The return on funding of research potential is often far greater at this level than it is at the doctoral level.

The article did, however, still leave me with a concern which I have also found in my contacts with a number of NRs and even non-N researchers in statistics in the American system, namely that it was only research activity per se which was seen as important: the goal set for NRs sometimes appears to be to do more of whatever comes to hand, regardless of the actual value of the area of work being tackled.

I would urge the NRC to foster debate on appropriate methods of directing new researchers into important areas, without losing the impetus of their new ideas and freshness. This is a hard problem. It is instructive to compare the approaches mentioned by W. Allen Wallis (*Statist. Sci.* 6 121–140) in this regard: the war-time Statistical Research Group being formed, “not too sure what they’d do, . . . but confident there would be war work for it,” in contrast to Wallis’s own statistical research, where each of his “substantive articles in statistics . . . was stimulated by some outside influence.”

Wallis does go on to say that in the field that is “really the heart of your work, one thing leads to another and is sort of self-directing”: but for a NR, and especially for one not perhaps of the calibre of the

Statistical Research Group or of Wallis himself, I believe there is a real need to ensure that appropriate “outside influences” will motivate substantive research. The danger otherwise is that the research is indeed “sort of self-directing” but is neither of a standard that the NR is capable of nor that society and our profession needs.

How might one encourage direction of research without suppressing initiative? I can suggest two ways. Firstly, the IMS itself might ask NRs to comment on the various invited papers published in its journals, in addition to the normal eminent commentators: at worst this pushes strong themes at NRs, even if their comments are not deep, or even not publishable; at best it brings forward fresh ideas on central topics.

Secondly, I believe that NRs can benefit enormously from “outside influences” gained by collaborating in consulting projects in much more depth than this article suggests. I was rather horrified by the somewhat glib prescription to NRs that “unless you need the data analysis experience, your role is to dispense advice” in a consulting context. This may reflect a historical underrecognition of good consulting and the value of close work with collaborators rather than clients, an attitude that has also flourished in Australia until recently, but it does mitigate against NRs actually finding out what the world is interested in, and guiding their research by providing the solutions.

Rejoinder

N. Altman, J. F. Angers, D. Banks, D. Duffy, J. Hardwick, C. Léger, M. Martin, D. Nolan (Chair), A. Owen, D. Politis, K. Roeder, T. N. Sriram, T. Stukel and Z. Ying

The New Researchers' Committee (NRC) thanks all discussants for their comments. The responses to the NRC article includes much advice on how New Researchers (NRs) can promote their own research careers and how senior researchers can actively assist NRs in their professional development. Also discussed are the action items in the NRC 1990 report to the IMS Council and the future goals and activities of the NRC and IMS. We hope this discussion will help NRs realize their full research potential, and hence directly benefit the entire statistical community.

We would like to thank Christiansen for her observations on what has eased her entry into the statistical research community. Many of her suggestions will be included in the next edition of the *New Researchers' Survival Guide* (Altman et al., 1991), which the NRC plans to update biannually. Of particular note is her advice to the graduate student to practice professional roles early, before entering the professional world. We support the position that doctoral students consider themselves statisticians and become involved in the statistical community while pursuing their doctoral studies. At this time in their career, the NR/student can pace their teaching, consulting, speaking and refereeing activities. They can also more easily seek advice from an advisor or other professor in their department, and share experiences with fellow students.

The 1990 New Researchers' Committee prepared the original article "Meeting the Needs of New Statistical Researchers." The 1991 New Researchers' Committee prepared this rejoinder. D. Nolan (Chair), Department of Statistics, University of California, Berkeley, 367 Evans Hall, Berkeley, California 94720; N. Altman, Biometrics, Cornell University; J. F. Angers, Département de Mathématiques et de Statistique, Université de Montréal; D. Banks, Department of Statistics, Carnegie Mellon University; D. Duffy, Bellcore; J. Hardwick, Department of Statistics, University of Michigan; C. Léger, Département IRO, Université de Montréal; M. Martin, Department of Statistics, Stanford University; A. Owen, Department of Statistics, Stanford University; D. Politis, Department of Statistics, Purdue University; K. Roeder, Department of Statistics, Yale University; T. N. Sriram, Department of Statistics, University of Georgia; T. Stukel, Community and Family Medicine, and Dartmouth Medical School; and Z. Ying, Department of Statistics, University of Illinois.

Christiansen calls for opportunities for NRs to be both included in professional activities with senior researchers and separated with special programs for NRs only. To date, the NRC has exclusively advocated the inclusion of NRs in professional activities such as refereeing, speaking at meetings and sitting on committees. However, separate activities for NRs offer the opportunity to develop contacts with other NRs without the anxieties that come with interacting with senior researchers. Successful examples of this type of activity include the Pathways to the Future Conference for new women researchers, held prior to the IMS and ASA annual meetings in 1988–91, and the biannual European Young Statisticians' Meeting sponsored by the Bernoulli Society since 1978, organized by NRs for NRs to meet and present research. One current project of the NRC is to determine the feasibility of a North American New Statisticians' Meeting modeled after the European meeting.

Arzberger et al. point out that the Pathways Conference is organized by senior researchers and funded in part by the National Science Foundation (NSF). Both Maar and Arzberger et al. provide valuable information to the NR in search of financial support for their research. We are particularly pleased that this discussion may help to publicize some of the new programs that have been recently set in place. The NRC wants to express our gratitude for the long-standing and vigorous efforts made by these agencies and others to foster the next wave of statisticians.

Tweedie emphasizes the need for senior researchers to get involved in shaping the research potential of new researchers. The NRC is grateful to Tweedie for singling out an important problem not directly tackled in our original article. New faculty in research universities are under great pressure to become expert in some narrow area, so that their tenure case trumpets their international standing. The best of us no doubt resist the easy path of increasingly deep study of a shrinking domain, but the explicit incentives for breadth are few. However, informal incentives do exist, most especially the sheer intellectual thrill of doing new things. Perhaps the NRC will consider the issue more thoroughly in the future.

As a means for increasing the breadth and depth of NRs, Tweedie calls for more collaborative research. Christiansen also remarks favorably on her experiences from collaborative research. Arzberger et al. list new funding programs geared toward interdisciplinary re-

search. The NRC echoes this support of collaborative research. We wish to clarify the comment made by Tweedie on our advice to the NR as consultant. As described in the *New Researchers' Survival Guide*, consulting comes in many shades. The high-level research, discussed by Tweedie, is termed collaboration in our report. In collaboration the client and consultant are on equal footing, each contributing his or her expertise to the problem, and it often leads to interesting new problems. Other consulting problems are more service-oriented. They require only basic packaged methods or a thoughtful modification of standard techniques. These cases do not typically lead to breakthrough research, but one has a professional obligation to attend to them kindly and constructively.

It is remarkable that Chernick and Herzberg have such different views of the value of double-blind refereeing. Chernick's experience and views broadly support the recommendations of our committee, and we thank him for taking so forceful a stand on such a divisive question. His example suggests that editors need to be periodically reminded of their responsibility to edit referees' comments. Also, timely prodding may do much to accelerate the process. Enforcing a swift response time is largely an editorial duty. Herzberg makes these same points about editorial duty.

Regarding Herzberg's comments on double-blind refereeing, in general the committee members agree with her points; however, we do not support her implied conclusion. The NRC has not suggested that new or minority researchers have been prejudiced against, but we do note that in other fields such prejudice has been shown to exist. In addition, NRs would be more comfortable if they were sure that their work were being judged only upon its merit. We encourage anyone who wants to undertake a study of double-blind refereeing in statistics to do so; however, it is unlikely that the outcome would change our recommendations. Much of the value of double-blind refereeing lies in the community perception of fairness. We share Herzberg's concern that separate considerations for NRs may appear to erode standards or create bias. In our article we stated that the creation of separate journal sections and editors may be against the best interests of NRs. However, the NRC strongly supports double-blind ref-

ereeing for its potential to remove separate consideration, perceived or otherwise.

Before concluding, we update some of the activities of the NRC and IMS.

1. The *New Researchers' Survival Guide*, from which the advice in the NRC article was taken, is now complete and available from the IMS business office. The guide offers advice to both the graduate student and recent degree recipient on topics such as how to choose a course curriculum, prepare for a job interview, read a referee's report, apply for funding and balance teaching, research and departmental obligations.

2. The NRC is organizing a "mini-conference" at the IMS 1992 meeting. The keynote speakers are to give NRs an overview of a topic of current interest in the statistical community. The NRC is also soliciting short papers from NRs in related areas.

3. In 1991, the IMS supported approximately 10 NRs to attend IMS conferences. The IMS is continuing this support in 1992. Applications for travel support are available in the *IMS Bulletin*.

4. The IMS has put together a committee to review the subject of double-blind refereeing. One committee member also sits on the NRC. Any comments should be directed to Nancy Reid, the chair of the committee.

5. The NRC participated in a writer's workshop held at the 1991 annual IMS meeting (see comments by Arzberger et al.). The purpose of the workshop was to give NRs individual assistance with writing papers.

Finally, we are pleased that the discussion has focused attention on how the statistical community can foster professional growth among new researchers. It is our aim that this discussion will generate further conversation on the subject and so will aid NRs in advancing their research careers and senior researchers in actively assisting NRs. Also, the NRC thanks the IMS for its role as an advocate for NRs, and we hope the IMS will continue to find new avenues of assistance for the professional development of NRs.

REFERENCE

- ALTMAN, N., BANKS, D., HARDWICK, J. and ROEDER, K., eds. (1991). *New Researchers' Survival Guide*. IMS, Hayward, Calif.