SURVEY OF 2001-2003 MARSDEN FAST-START GRANT RECIPIENTS

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Executive Summary

- The Marsden Fast-Start scheme was established in 2001, in response to feedback from the research community that more support was needed for young researchers. The scheme funds emerging researchers to lead their own projects, supporting them to establish independent careers and create research momentum. Eligibility is restricted to those with:
  - no more than 7 years' research experience since completing their PhD;
  - no prior history as a Principal Investigator on a Marsden grant;
  - a staff position at a New Zealand Institution (excluding postdoctoral researchers).

  Fast-Start grants are small in comparison to standard Marsden grants; restricted to a 2 year duration and a maximum funding level in 2001-2003, of $50,000 per annum. In 2004, the funding cap was raised to $70,000 per year.

- This report describes the results of a survey of 2001, 2002 and 2003 Fast-Start recipients. The survey focussed on:
  - research and career development outcomes from the grants;
  - barriers faced by recipients, and;
  - recipients' priorities for the development of the scheme.

- 58 (89%) of the 65 recipients responded. There was good representation of recipients from different award years, subjects, and institution types.

- The scheme has been successful in enabling emerging researchers to establish research momentum. Grants had led to further work for 13 out of the 14 recipients who had completed their grants. One third stated that they had gained further funding to extend their Fast-Start research, and 5 of the 19 2001 recipients and 1 of the 18 2002 recipients have gone on to become principal investigators on standard Marsden grants.

- Most recipients applied for Fast-Start grants instead of standard Marsden grants because they felt it gave them a better chance of success. Some had traded off the higher chance of success in the Fast-Start scheme against the larger sum of money available in standard grants. Others said that the grant size and duration were adequate for their project and/or that they had not wanted the burden of managing a larger grant.

- Three quarters of recipients said that the grant had influenced their career progression, while the remainder said that it had not or had not yet. It affected career progression by:
  - raising the researcher's profile or prestige;
  - enabling researchers to establish their own research base;
  - giving recipients an opportunity to generate publications and networks, and;
  - assisting with gaining promotions, further funding and improved Performance Based Research Fund rankings.

  21% said that the grant had contributed to a promotion or a new job, some experiencing accelerated promotion to professor or associate professor.

- An important way in which the grants influence recipients' careers is through the prestige associated with the Marsden Fund. Comments indicated that gaining a grant with the "Marsden" name attached was viewed as particularly prestigious.

- Conversely, only just over half of recipients believe that the grants provide adequate support to "launch" independent research careers. The small size and two year duration limit the extent to which a Fast-Start grant alone can support the transition to established research leader. Recipients had mixed feelings over whether or not this is a problem; some thought that the necessity of gaining extra support was a positive aspect, motivating young researchers to take the initiative in building their careers, while others thought that too

much time was consumed by making further grant applications, and that the grant's small size and duration limited research achievement.

- Two thirds of recipients said that the two year duration and $50,000 funding cap had restricted their progress. Of most concern was the funding cap, but the 2 year duration also drew criticism. Several felt that they had been restricted by the inability to support PhD students on their 2 year grant. Institutional overheads are a concern for many recipients as they can cut a considerable swath from a $50,000 grant.

- Recipients were asked to rank the importance of funding different items with a Fast-Start grant, and although some differences between subjects were seen, the overall average rankings of different items were, from highest to lowest:
  - principal investigator time;
  - consumables/equipment;
  - travel/conference attendance;
  - technician/research assistant;
  - PhD students;
  - in last-equal place: outsourced services and Masters students.

  The fact that PhD students received a higher average ranking than Masters students is interesting as the grant duration allows Masters students (1-2 year course) but not PhD students (3 year course) to be supported

- When asked to choose between more grants, larger grants or longer grants, if the scheme were to be enlarged, the largest group (nearly half of respondents) chose more grants. This is surprising given that two thirds of recipients found the small size and short duration of their grant restrictive. However it is in line with some of the comments in which recipients stated that although they had experienced difficulties with the size and duration of the grant, they nevertheless thought that it was more important to give small grants to a greater number of emerging researchers than to give more resources to a few.

- Differences between subjects existed in the responses to some questions. The most striking difference was that researchers in the field of biomedical science were more likely to have experienced restrictions due to the small size and short duration of the grants. These researchers overwhelmingly thought that the scheme should fund larger grants if it were expanded, and put a high priority on the funding of consumables/equipment.

- Three recommendations arise from the survey findings:

  1. ***Enlarge the scheme to fund more Fast-Start grants.***
     The Fast-Start scheme is highly valued by recipients; it has seeded ongoing research programmes and had a significant impact on recipients' career progression. Interest in the scheme has grown, with a 77% jump in Fast-Start applications in 2004. More recipients chose the funding of more grants as a priority, than chose either longer or larger grants.
  2. ***Monitor the effect of increasing the size of grants to $70,000 per annum***
     Many of the recipients had found it difficult to carry out their research on $50,000 per year. Since they were awarded their grants, the maximum size has been increased to $70,000 per year. The effect of this increase in grant size should be monitored to ascertain whether it is redressing the issues raised in this survey.
  3. ***Consider introducing some flexibility with respect to grant size, particularly in expensive subject areas such as biomedical sciences***
     Given that responses varied across subject as to the effectiveness of the scheme in launching careers, and the extent to which the rules of the scheme had restricted progress, a case can be made for introducing the capacity to tailor grant sizes to the requirements of individual subject areas. One possibility would be to bring in funding level guidelines, but abolish the absolute funding cap.

Contents

Introduction

The Marsden Fund was set up in 1994 to support excellence in research and researchers. It is the only New Zealand Government fund for research that is not in any way subject to socio-economic criteria. The objectives of the Fund are:

- to enhance the underpinning research knowledge base in New Zealand, and contribute to the global advancement of knowledge;
- to broaden and deepen the research skill base in New Zealand, and;
- to enhance the quality of the research environment in New Zealand by creating increased opportunity to undertake excellent investigator-initiated research.

Projects are selected by peer review panels on the basis of merit, and research is supported in all areas of natural science, mathematics, engineering, social science and humanities. In most cases, these standard Marsden grants are given for a period of three years.

The Marsden Fast-Start scheme was established in 2001, in response to feedback from the research community that more support was needed for young researchers. The scheme is restricted to researchers who have:

- no more than 7 years' research experience since completing their PhD;
- not previously been a Principal Investigator on a Marsden grant;
- a staff position at a New Zealand institution.

The scheme is intended to enable these researchers to establish independent research careers and create research momentum. Recipients lead their own research and are not simply part of a larger group. Postdoctoral researchers are not eligible.

The Fast-Start grants are small in comparison to standard Marsden grants. They are restricted to a 2 year duration and a maximum funding level in 2001, 2002, and 2003, of $50,000 per annum. For 2004 applications, the funding cap was raised to $70,000 per year.

The scheme has now been running for 3 years and most of the 2001 recipients have completed their contracts. It is therefore appropriate that a review of the scheme be undertaken at this time. This report describes the results of a survey of 2001, 2002 and 2003 Fast-Start recipients carried out in August, 2004. The survey gathered data on:

- research and career development outcomes from the grants;
- barriers faced by recipients, and;
- recipients' priorities for the development of the scheme.

Methodology

Recipients of Fast-Start grants awarded in the 2001, 2002 and 2003 funding rounds were surveyed using an online questionnaire, in order to find out:

- what effects the grants had on their further work and career progression;
- whether they felt the scheme provided adequate support, and;
- what their priorities were for development of the scheme.

The text of the online questionnaire is given in the Appendix to this report.

The online questionnaire was developed and run using the software: “Collect It”, developed for the Royal Society of New Zealand by PerfectData Corporation Ltd, Wellington. Data was analysed using Microsoft Excel and Microsoft Access.

Survey Population

Overall, of the 65 recipients surveyed, 58 responded (89% response rate). 14 of the 58 had completed their Fast-Start grants (comprising all but 2 of the completed grant holders). A break down of response rate by year is given in Table 1, and by institution type in Table 2. The survey responses provide good representation of recipients from the different years and institution types.

Table 1. Response rate by year and grant status (completed or not completed)

Grant Year		**# Grants**	**# Responses**	**Response Rate**
2001	Completed	16	14	88%
	Not completed	3	2	67%
2002	(none completed)	18	17	94%
2003	(none completed)	28	25	89%
All Years		65	58	89%

Table 2. Response rate by institution type

Institution Type	**# Grants**	**# Responses**	**Response Rate**
University	51	45	88%
CRI	12	11	92%
Private	2	2	100%

Table 3. Response rate by subject

Subject	**# Grants**	**# Responses**	**Response Rate**
B&B/BMS	6	6	100%
CMP	6	6	100%
EEB	8	7	88%
ESA	6	6	100%
HUM	8	7	88%
MIS	9	9	100%
PSE	7	5	71%
SOC	15	12	80%

Grants are classified according to the selection panel that funded them. Abbreviations are:

B&B Biochemical and Biochemical Sciences
BMS Biomedical Sciences (replaced B&B in 2002)
CMP Cellular Molecular and Physiological Biology
EEB Evolution, Ecology & Behaviour
ESA Earth Sciences and Astronomy
HUM Humanities
MIS Mathematical and Information Sciences
PSE Physical Sciences and Engineering
SOC Social Sciences

Two grants were funded by more than one selection panel. They were re-categorised as follows:
1grant: EEB/MIS categorised into MIS
1grant: CMP/EEB categorised into EEB

Not all respondents answered every question, therefore some questions have fewer answers than the total response rates given above.

Results

Further work after completion of Fast-Start grants

For 13 out of the 14 completed grant holders, the Fast-Start grant had led to further work. When asked to describe the further work, the following answers were given:

- 13/13 (100%) said that it had led to an extension of the project or development of new ideas or a related project;
- 7/13 (54%) said it had allowed them to develop new collaborative work;
- 4/13 (31%) stated that they had been successful in gaining further funding to extend their Fast-Start research (note, however, that this is likely to be an underestimate as they were not asked directly about further funding);
- 1/13 said it had led to consultancy work, and;
- 1/13 said it had led to some public outreach activities.

Two examples of further work are given below

In 1996, radiocarbon dating of polynesian rat (kiore) bones showed that kiore had been present in New Zealand 1000 years before the first archaeological evidence of human settlement. This controversial finding suggested that people had landed, but not settled, in New Zealand much earlier than previously thought. Debate has raged over the old kiore bone dates for 8 years – some supporting the findings, and others suggesting that the kiore bone radiocarbon dates were anomalous.

Dr Janet Wilmshurst (Landcare Research) was awarded a Fast-Start grant in 2001, for her proposal to use a novel method to date the arrival of kiore in New Zealand. Circumventing the problems with dating kiore bones, she and co-investigators radiocarbon dated ancient seed cases that had been gnawed open by kiore (identified by their tell-tale tooth marks). Through their Fast-Start-funded work, they were able to show that the dating of gnawed seed cases is an accurate and reliable way to determine the history of kiore presence. For the North Island, they found that the timing of kiore arrival concurred with archaeological evidence of the first human settlement, suggesting that the very old dates of kiore bones were anomalous. However more work is now needed to confirm this because most of the very old kiore bones have been found in the South Island.

In 2004 Dr Wilmshurst was awarded a full Marsden grant to extend her analyses to the South Island and to conduct investigations that will improve the understanding and reliability of radiocarbon dating rat bones. In addition, her Fast-Start grant has led to several pieces of collaborative work, an invitation from the Department of Conservation to find out if the rat-gnawed seed case method can determine whether rats have historically been present on Resolution Island (under development as an offshore sanctuary), and participation in a documentary on the History of New Zealand.

In 1995, physicists produced a new phase of matter: the Bose-Einstein condensate. Predicted by Einstein in the 1920s, it took more than 70 years to actually generate the condensate in the laboratory. Bose-Einstein condensates can be generated in extremely cold temperatures which result in the coalescence of gaseous atoms into a "super atom" with properties quite unlike any seen before.

Dr David Hutchinson, University of Otago, was awarded a Fast-Start grant in 2001 to develop new and improved theoretical models of condensate behaviour. Other models have assumed that condensates form at a temperature of absolute zero, but in actual fact they form at slightly above zero. Dr Hutchinson's model takes account of this, creating a much more realistic scenario, in which there is continual interchange of atoms between the condensate and the surrounding gas. The model has proven successful, and he has been able to resolve some anomalous findings that have troubled researchers since 1997. In recognition of this work, earlier this year he was awarded the Rowheath Trust Award and the Carl Smith Medal by the University of Otago.

"The work undertaken through my Fast-Start contract naturally led on to a full proposal to study Bose-Einstein condensation and related phenomena in low-dimensional systems"
In 2003, Dr Hutchinson was awarded a full Marsden grant to develop a model for the less well-studied, 2 dimensional Bose-Einstein condensates (i.e. shaped like pancakes rather than spheres). Ultimately, this work will develop our fundamental understanding of this new phase of matter, and may lead to insights into other 2 dimensional systems such as high temperature superconductors.

More generally, work in the field of Bose-Einstein condensation may provide an avenue into revolutionary new technologies such as quantum computing and atomic lasers.

Why do researchers apply for Fast-Start grants?

When asked why they applied for a Fast-Start grant rather than a standard Marsden grant, the overwhelming response was that they felt their chances of success were higher when not competing against more established researchers (74% of the 58 respondents).
Other reasons given were:

- 24% said they applied because the scheme was targeted to their career stage;
- 3% stated that they had previously applied unsuccessfully for a standard Marsden grant;
- 9% thought that the Fast-Start grant would allow them to develop their research into a competitive standard Marsden grant proposal;
- 9% thought it would be a good way to get themselves and their research established;
- 7% applied because they had a small project in mind that was appropriate for a Fast-Start grant;
- 7% said it allowed them to develop their own research project without the burden of managing a large piece of work or having to collaborate and negotiate with others;
- 7% said that they felt that their speculative/risky research topic would have a higher chance of success in Fast-Start round;
- 5% said that at the time of applying they did not have the NZ contacts or knowledge necessary to lead a larger project suitable for a standard Marsden grant.

Several said that they had to decide between the higher chance of success in the Fast-Start competition, and the larger sum of money available in a standard grant. They had concluded that it would be better to get at least some money from a Fast-Start grant than to get none from an unsuccessful standard bid. Others did not mention this trade-off, stating that the grant size was appropriate to the project they had in mind and/or to their career stage.

"I was advised by the university that my chances of success would be higher for a fast start grant than for a standard Marsden grant, and the priority at the time was to just get some

money into the lab so that work could start, rather than risk no money coming in and having to wait another year."

"Because we had a project that was "do-able" with the relatively small sum it granted, it seemed more appropriate to apply for a Fast Start. Also, because we were emerging researchers, we perceived that we had a better chance of success with the Fast Start because our CVs would be more competitive when compared against scientists at a similar stage in their careers. In addition, even though the sum of funding was relatively small, if we were successful, then it would provide us with the necessary stepping stone to get ahead, and put us in the position of being more competitive for future standard Marsden proposals."

For one third of recipients, their successful Fast-Start bid was the first application they had ever made for research funding (excluding prior Fast-Start bids and applications for scholarships or fellowships).

Influence on career progression

Recipients were asked if the grant had affected their career progression, and if so, in what way. 74% said that it had affected their career, while the remaining 26% said no or not yet. The ways in which it affected career progression included:

- raising the researcher's profile or prestige, e.g.

  "There is a sudden recognition that what you are doing must be good if Marsden are willing to fund it."

  "My 'stock' has risen within the department as a consequence of successfully attracting funding which carried overhead. The Marsden Fund is regarded as the most prestigious and the most difficult source of funding to obtain within my department."

  "receiving such a prestigious grant early in my career has given me the opportunity to demonstrate my ability to procure funding and undertake a research program independent of other established scientists."

- Assisting in gaining promotions, further funding, and improved PBRF ratings. Of particular note, 21% stated that the grant had contributed to a promotion or gaining a new job.

  "The Fast-Start grant has been very highly regarded by my Dean and by my faculty. It is considered prestigious because it is so competitive, especially for my discipline. This has contributed significantly to my accelerated promotion to the position of Associate Professor (backed also by a successful publication record)."

  "The fast-start grant was instrumental in my progression from Lecturer to Senior Lecturer and then to Associate Professor. The Full Marsden grant that I subsequently obtained, to continue work undertaken for the Fast-Start grant was instrumental in my recent appointment as Professor."

- Establishing their own research base:

  "After returning to NZ from overseas, the Fast-Start Marsden gave me the opportunity to establish the foundations of a study system in NZ with which I am now continuing to investigate the … questions that are the focus of my career."

  "It gave me a chance to initiate a project and begin to establish a research program at the University. Without this I think I would probably have given up and gone back [overseas]!"

"It is very difficult for a young academic to get started with research, especially because of the teaching commitments, which are particularly heavy at the beginning of the career. In my case (which is getting to be so common to have almost become the rule in my discipline) the situation is made worse by the fact that I came to my department from another country and had to learn the whole institutional, educational, and social setting in addition to everything else. It is fair to say that my ability to pursue a satisfactory research program would have been severely hampered without Marsden's assistance."

"It's certainly the best thing that's happened in my career. Firstly the project is a great topic and a new research field for me, and one that I expect to remain a life-long speciality. I'm particularly pleased that the Fast-Start scheme makes explicit provision for embarking on new specialities. This stage in the career (5 years post-PhD) is an excellent time to establish a research area and research team. This was my first opportunity to embark on my own research programme, rather than slotting in with other people's research"

- Giving them the opportunity to generate publications and develop research collaborations and networks that assist in career progression.

  "The grant has led to the establishment of significant ongoing collaborative links with researchers at [two New Zealand institutions]. It has also led to publications and research achievements that bode well in the context of my application for promotion (currently under consideration) and the new Performance Based Research Fund."

Does the scheme provide sufficient support to launch a research career?

Overall, just over half (56%) said that they thought the scheme provided sufficient support to launch a research career. Responses to this question did not vary significantly by institution type (University/CRI/private), but did vary across subjects (Figure 1). Respondents in the biological areas BMS and CMP, and in physical sciences and engineering (PSE), were less likely to feel that the scheme provided sufficient support. None of the BMS researchers answered yes to this question.

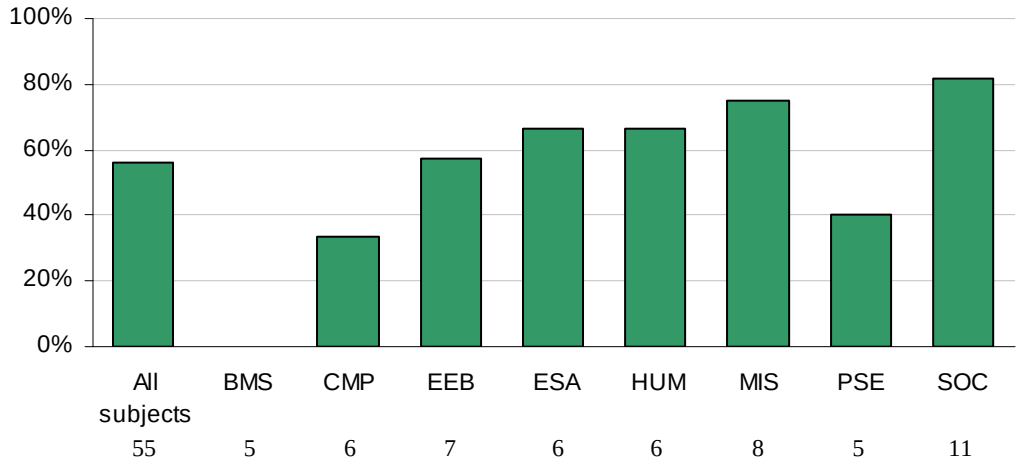

Figure 1. The percentage of respondents, by subject, who feel that the Fast-Start scheme provides sufficient support to launch a research career. The numbers below the graph give total number of responses (yes and no) from each subject area. See Table 3 for a key to the abbreviations.

When asked for comment, both positive and negative aspects were highlighted. Positive aspects included:

- adequate grant size/duration;
- the prestige of the grant and its effectiveness in "opening doors" for recipients;
- the ability to "buy-out" time from teaching and other duties, and;
- the way in which the scheme enables young researchers to do their own, individual work and "get out from under" established researchers

Negative aspects focussed mostly on the small size and short duration of the grants, and the restrictions these aspects placed on recipients. Several mentioned that they thought the recent rise in the funding cap from $50k/year to $70k/year would help to address these problems.

Many discussed a tension in relation to the capacity of the scheme to launch careers. In their opinion, while the grant can help immensely in developing prestige and launching an independent piece of research, it is too small to really build research momentum. This means that recipients must gain additional funds in order to fully establish their research. Some discussed this as a positive aspect, seeing value in motivating young researchers to take initiative in building their own careers. Others discussed the negative ramifications: the limits this placed on achievement, and the time consumed by making extra grant applications (that could be more profitably be spent doing research). A few of those who discussed negative aspects, nonetheless commented that it is better to provide some money to young researchers than none, and that therefore, if a choice must be made between larger/longer grants, and more grants, they would prefer more grants.

Do the rules of the scheme restrict progress?

The Fast-Start grants are small ($50k per annum in 2001-2003), and are restricted to a maximum 2 year duration. This survey asked whether these two rules had restricted recipients' progress on their projects in any way. Two thirds of recipients stated that the funding cap and/or the 2 year duration had been restrictive (Figure 2). The percentage who had experienced restrictions did not vary significantly by institution type, but did vary between subjects. The highest percentages of recipients who experienced restrictions were found in the areas of EEB (100%), BMS (83%), and MIS (78%). The least likely to experience restrictions were those in the areas of CMP (40%), ESA (50%), and SOC (50%).

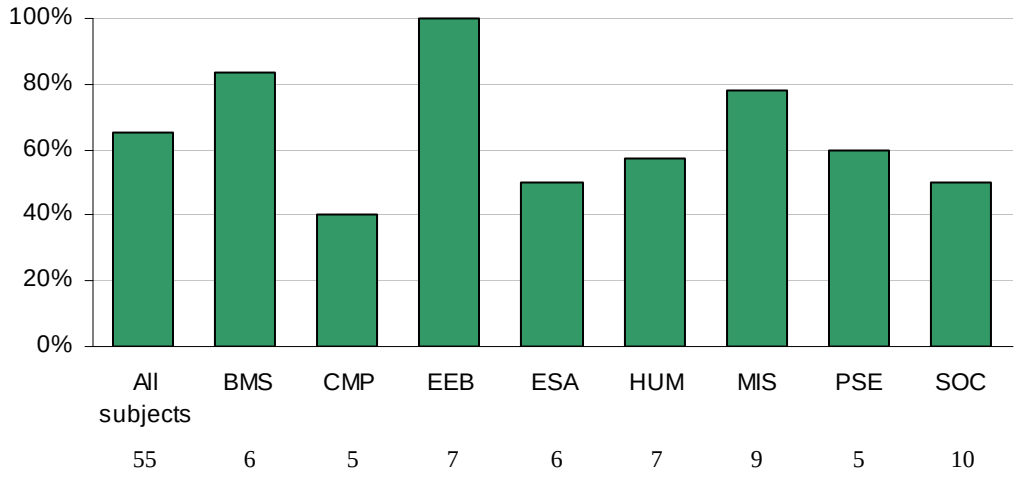

Figure 2. Percentage of respondents, by subject, for whom the funding level and/or grant duration had been restrictive. The numbers below the graph give the total number of responses from each subject area. See Table 3 for a key to abbreviations.

The comments made in response to this question revealed the factors that resulted in recipients experiencing or not experiencing restrictions:

- 12% said that these rules were not restrictive because they had specifically designed their project to fit within them, and 14% said that they thought the rules were beneficial because they stimulated targetted work, allowed exploration of risky areas, and did not place too many burdens on young principal investigators;
- 30% stated that they were happy with the 2 year duration, but found the funding cap restrictive, while 16% said that the converse was true. A further 10% found both the funding cap and the short duration restrictive;
- Of the various restrictions experienced, the two most commonly specified were:
    - the inability to support a PhD student within the rules of the scheme (14%), and;
    - high institutional overheads seriously restricting the amount of money available to conduct research (16% of respondents). Comment about overheads was also received in other sections of the survey, and will be discussed further below.
- As for the previous question, several anticipated that the increase to $70k per annum will make the scheme less restrictive.

What are the most important elements for Fast-Start grants to fund?

Recipients were asked to rank a number of items, from most to least important, for Fast-Start grants to fund. The average rankings across all subjects and in individual subjects are shown in Figure 3. Overall, the most highly ranked area was funding of the principal investigator's own time, followed by funding for consumables/equipment, and then funding for travel and/or conference attendance. Funding for a PhD student ranked below funding for a technician or research assistant, but above funding for a Masters student. This is interesting, as the grants can currently support Masters students but are too short to support PhDs.

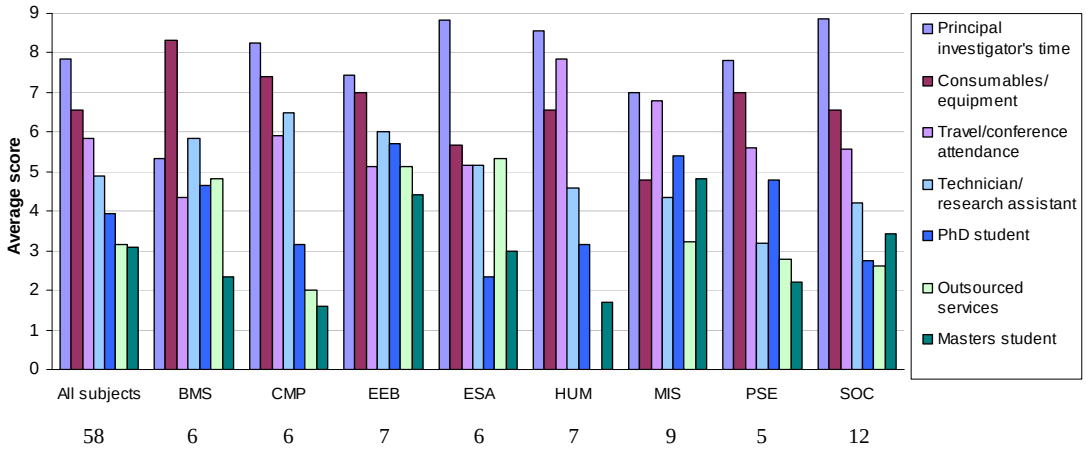

Figure 3. Average rankings of the importance of funding different elements. The higher the score, the more important an element is; the highest score achievable is 9. The numbers below the graph give total number of responses from each subject area. See Table 3 for a key to abbreviations.

The area of BMS is notably different from the other areas in that it is the only subject in which funding for principal investigators' time is not the highest ranked item. It ranks funding for consumables/equipment almost one third higher than any other items, echoing comments

from some recipients in this subject, who, when asked if the scheme provided adequate support for launching a career, stated that their progress had been restricted by a lack of funds to purchase consumables/equipment.

MIS also has different rankings to other areas, with comparatively high rankings for travel/conference attendance, and for funding PhD and Masters students. Humanities (HUM) researchers also place a high importance on travel/conference attendance as compared to other subject areas.

Should the scheme fund more grants, longer grants or larger grants?

Recipients were asked which they thought would be the most beneficial if the Fast-Start scheme were to be enlarged: larger grants, longer grants, or more grants. Overall, 47% chose more grants, 33% chose larger, and 21% chose longer. Results by subject are shown in Figure 4.

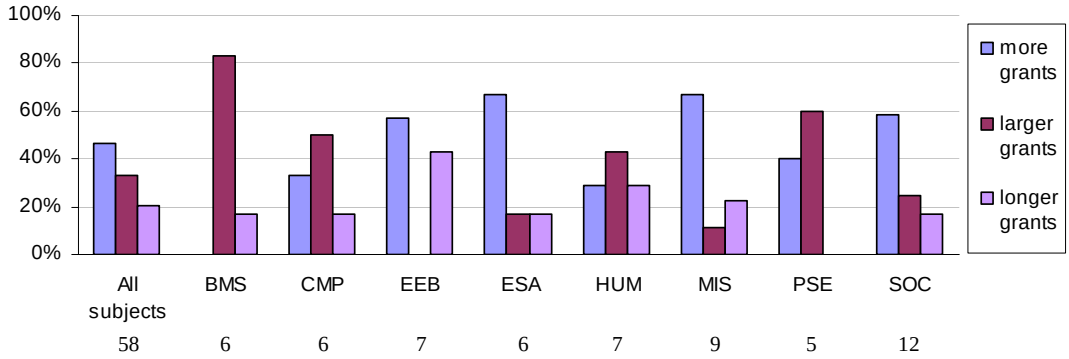

Figure 4. Percentage recipients who think that the scheme should fund more grants, larger grants, or longer grants, by subject. The numbers below the graph give the total number of responses from each subject area. See Table 3 for a key to abbreviations.

While ESA, MIS and SOC recipients were most often in support of funding more grants, the majority of recipients in the areas of BMS, CMP and PSE thought that larger grants were more important. Recipients in HUM were fairly evenly split between the three options, while recipients in the area of EEB wanted either more grants or longer grants.

The desire for larger grants in PSE and in the biological science areas of BMS and CMP may be related to the finding that recipients in these areas are the least likely to feel that the scheme provides sufficient support to launch a research career (Figure 1). It should be noted, however, that since these researchers received their grants, the maximum grant size has increased from $50k to $70k per annum. This may address the problem in these areas.

Overarching themes and suggestions made by recipients

Overall, the scheme is highly valued by recipients, and has resulted in very significant career development for some. A number of recipients are concerned that the size and the duration of the grants is inadequate. However, this may be mitigated by the recent increase in grant size. When asked to choose, just under 50% stated that they would prefer more grants awarded rather than longer or larger grants.

A commonly raised issue was the extent to which institutional overheads cut into Fast-Start grants. Although comment on overheads was not specifically asked for, 24 of the 58

respondents (41%) mentioned them as a problem at some point in the survey. Some examples were given of how little money was left over to conduct research after subtraction of overheads, and one recipient suggested that institutions should show their support for the scheme by waiving overheads for Fast-Start grants.

Recipients made various suggestions for improving the scheme. The most common were:

- Extend the duration of grants, or make extensions available beyond the two years;
- Increase the size of grants;
- Increase the grant size and duration;
- Introduce flexibility in funding levels by having guidelines, but no set funding cap.

Many took the opportunity in their final comments to emphasise the value they placed on the scheme. Three such comments are below:

"I think that establishing the Fast Start scheme was a brilliant idea. Since the inception of the Marsden fund, young researchers who came up with a good idea for a project have found it really frustrating because they know their CVs might not be competitive enough to get through the first round when compared with senior scientists with long and impressive CVs. The only way they could get their idea funded by Marsden was to collaborate with an impressive senior scientist and play second fiddle. Although this was ok in that you could get the science completed in whatever way it took, and you developed collaborative links with senior scientists, what it didn't do, was provide the emergent researcher with any kudos for the work, or career progression, as all this went to the PI who might not even have played a very significant role in the inception or completion of the work. I think this problem has now been solved with the Fast Start scheme. It provides the emergent researcher with a stepping stone towards further success."

"The Marsden fast start program is a great encouragement to scientists early in their career like myself. There are so many uncertainties after finishing a PhD, particularly with respect to funding. So it is highly reassuring to have a small grant funded, even if it doesn't cover ones entire salary for a year (thus, I'm in favour of more, rather than bigger and longer grants). It's a great way to really start researching on your own, without the meddling of an advisor or boss and develop one's intellectual and financial independence. The existence of a pool of funding that is accessible only to only young, rather inexperienced researchers (rather than the "big guns"), provides a more level playing field, and the confidence and experience gained from securing a small "fast-start" grant helps significantly for subsequent grant writing!"

"It has helped my research agenda in many ways already and I anticipate that there are still many benefits yet to be revealed. Unlike other funding bodies in New Zealand I believe that the fast start in particular and Marsden more generally really understands the nature of research and the flexibility required to get results. By ring fencing fast start money for new researchers Marsden ensures that there is always a new cohort of researchers being fostered in New Zealand. Thus, there are people always feeding into the broader research landscape. This can only be a good thing in the long run for the country."

Conclusions and Recommendations

Outcomes from the Scheme

The intention of the Fast-Start scheme is to enable emerging researchers to establish research momentum through leading their own project. The results from this survey show that the scheme achieves this aim. Grants had led to further work for 13 out of the 14 completed grant holders, in which they extended the project and/or developed a related project or new ideas. One third of completed grant holders stated that they had gained further funding to extend their Fast-Start research, and data extracted from the Marsden Fund database shows that, so far, 5 out of the 19 recipients of grants awarded in 2001 and 1 of the 18 recipients from 2002 have gone on to become principal investigators on full Marsden grants.

Why Do Researchers Apply to the Scheme?

Predominantly, researchers applied for Fast-Start grants rather than standard Marsden grants because they felt that they had a better chance of success. Some mentioned that they had made a trade off between the higher chance of success in the Fast-Start scheme, and the larger grants available in the standard Marsden category. However, opinion was divided on this front; others stated that the grant size and duration was adequate for their project and/or that they did not, at that stage in their careers, want the burden of managing a larger grant.

Supporting Young Researchers to Launch Independent Careers

Three quarters of recipients said that the grant had influenced their career progression, while the remainder said that it had not, or had not done so yet. It had affected recipients' career progression by raising their profile or prestige, enabling them to establish their own research base, providing an opportunity to generate the publications and networks that are needed for career progression, and assisting with gaining promotions, further funding and improved Performance Based Research Fund rankings. Significantly, 21% said that the grant had contributed to a promotion or a new job. Some had gained accelerated promotion to professor or associate professor.

Conversely however, while the scheme has influenced the career progression of the majority of recipients, only just over half believe that it provides adequate support to launch an independent research career. The small grant size and two year duration are felt to limit the extent to which a Fast-Start grant alone can support the transition to established research leader. There was mixed feeling over the extent to which this is a problem. In a number of cases the grant had provided, in the words of one respondent, "a toehold", making it possible to obtain further research support. Some commented that the necessity of gaining extra support was helpful, motivating young researchers to take initiative in building their careers, while others thought that it was detrimental, with extra grant applications consuming valuable research time, and the grant's small size and duration placing limits on research achievement.

An interesting finding is that an important way in which the Fast-Start grants influence recipients' career progression is through the prestige associated with the Marsden Fund. It appears that gaining a grant with the "Marsden" name attached can greatly assist the development of an emerging researcher's reputation. In some instances this aspect was felt to compensate for the low level of financial support provided by the grant. Prestige may be a particularly important issue for emerging researchers who face the challenge of establishing their reputations, and who, on average, received low rankings in the New Zealand tertiary sector's Performance Based Research Fund assessment[1].

[1] Tertiary Education Commission (2003) Performance-Based Research Fund - Evaluating Research Excellence: the 2003 assessment. Wellington.
Available: http://www.tec.govt.nz/funding/research/pbrf/assessment2003.htm

Barriers Faced by Recipients

Two thirds of recipients stated that the rules of the scheme (two year duration and maximum funding cap) had restricted their progress. The most frequently made comment (from 30% of recipients) was that the two year duration was not restrictive, but the funding cap was. A further 10% found both the funding cap and the duration restrictive, and 16% stated that only the 2 year duration was restrictive. The inability to support PhD students on Fast-Start grants was felt by several to be restrictive, and this is in accordance with other results showing that recipients consider support for PhD students to be more important than support for Masters students.

Institutional overheads are also a concern for many recipients. Although none of the survey questions asked about overheads, overall, 41% of respondents mentioned them as a problem. Overheads may be particularly troublesome for Fast-Start recipients because of the small size of the grants. Personnel time on the project cannot be cut too low without it becoming impossible to carry out the project, and salaries plus their associated overheads can therefore cut a considerable swath from a $50,000 grant, leaving little to spare for actual research costs. It also appeared that at the preliminary proposal stage, some recipients had not been aware of the extent to which institutional overheads would limit the funds available for research costs.

It should be noted that all the Fast-Start recipients surveyed received grants that were capped at a maximum value of $50,000 per annum. Since this time, the cap has been raised to $70,000 per annum. It remains to be seen to what extent this increase will alleviate the problems with the small size of grants, but some recipients did comment that they thought the extra $20,000 per year would have been very beneficial.

Recipients' Priorities for the Scheme

Recipients had a diversity of opinion on what were the most important elements for a Fast-Start grant to fund, and some differences in priorities were seen between subjects (see below). Overall, the element that received the highest average ranking was principal investigator time, followed by consumables/equipment, then travel, then technicians/research assistants, then PhD students, and in last-equal place: outsourced services and Masters students. These priorities are in line with what could be expected for small project grants targeted at emerging researchers. The fact that the funding of PhD students received a higher average ranking than funding of Masters students is interesting as the two year duration of the grants currently means that Masters but not PhD students can be supported. This, in combination with the fact that several recipients had found the inability to support PhD students restrictive, suggests that there could be an argument for extending the grants to three years.

There was also a diversity of opinion on whether it would be better for the scheme to provide more grants, larger grants or longer grants. Answers differed somewhat between subject areas (see below), but overall, the largest group (nearly half of respondents) chose more grants. This is surprising, given that two thirds of recipients said that the small size and short duration of their grant had been restrictive, but it is in line with some of the comments. Some stated that although they had experienced difficulties with the size and duration of the grant, they would nevertheless prefer to see more researchers funded than an extension or enlargement of individual grants. These recipients felt that it was more important to give small grants to a greater number of emerging researchers than to give more resources to only a few.

One third of recipients thought that grants should be made larger, and one fifth thought that they should be of a longer duration. The size of grants has recently been increased, and it remains to be seen how this will affect recipients' progress. A case could be made for lengthening the duration of grants beyond two years, in particular, to allow Fast-Start researchers to support PhD students. However the results of this survey suggest that if limited extra funds are available, giving more grants should be a higher priority. The demand for Fast-Start grants is increasing, and in the last year (possibly in response to implementation of

the Performance Based Research Fund), Fast-Start applications rose sharply from 129 in 2003, to 228 in 2004.

Differences Between Institution Types

Given the differing aims, research strengths, and organisational structures of the Universities and Crown Research Institutes (CRIs), one might expect to see differences in the responses from researchers at Universities and at CRIs, particularly in the areas of adequacy of support, restrictions experienced, and priorities for funding. However no significant differences were found

Differences Between Fields

Responses did differ between subject areas, although some caution must be taken in interpreting these results due to the low number of responses in individual fields. Below is a summary of each field's responses, highlighting, in particular, any differences between the field's and the overall responses.

Biomedical Science (BMS):
Responses from researchers in BMS were markedly different from other areas. None of the BMS recipients felt that the scheme provided sufficient support to launch a research career, and 5 of the 6 said the rules of the scheme had restricted their progress. Some commented that the grant had not provided adequate funds for the purchase of consumables and/or equipment, and in line with this, consumables/equipment were the most highly ranked funding priority, sitting almost one third higher than principal investigator's time. BMS was the only area in which no researchers thought that more grants should be funded if the scheme were enlarged. Instead, 5 of the 6 chose larger grants, and 1 chose longer. Taken together, these results suggest that researchers in this field may find it especially difficult to finance their research with small Fast-Start grants. The impact of raising the funding to $70,000 per annum remains to be seen.

Cellular, Molecular and Physiological Biology (CMP):
Only 2 out of 6 CMP recipients felt that the scheme provided adequate support to launch a research career, but conversely, most (3 out of 5) said that the rules of the scheme had not restricted their progress. The ranking of the importance of different elements (e.g. principal investigator time) were largely consistent with rankings from the overall survey population. Three of the 6 CMP researchers would prefer the scheme to fund larger grants, while 2 would prefer more grants.

Evolution, Ecology and Behaviour (EEB):
Around half of EEB researchers (4 out of 7), think that the scheme provides adequate support for launching a research career. On the other hand, all stated that they had found the rules of the scheme restrictive. The rankings of the importance of different elements were fairly similar to those for the overall survey population, except that travel/conference attendance was ranked slightly lower (possibly an artefact of the small number of responses). Unlike other fields, none of the EEB recipients chose larger grants as a funding priority. Opinion was fairly evenly split over whether the scheme should fund more grants or longer grants.

Earth Sciences and Astronomy (ESA):
Overall, ESA researchers appeared to be slightly more positive than the overall survey population regarding the level of support that the Fast-Start grants provide. Two thirds (4 out of 6) thought that the scheme provided adequate support to launch a research career, and half said that the rules had restricted their progress. In line with the overall survey population, ESA researchers ranked principal investigator's time as the most important element to fund. Second equal in the average rankings, were consumables/equipment, travel/conference attendance, technician/research assistant, and outsourced services. In comparison to the

overall survey population, outsourced services received a relatively high ranking. The majority of ESA recipients would prefer the scheme to fund more grants, if it were to be enlarged.

Mathematical and Information Sciences (MIS):
While the majority of MIS researchers (6 out of 8) thought that the scheme provided adequate support to launch a research career, most (7 out of 9) also said that the rules of the scheme had restricted their progress. MIS researchers had quite different priorities to the overall population on the importance of funding different elements: travel/conference attendance, and principal investigator's time ranked first-equal, and PhD and Masters students ranked relatively high, while consumables/equipment and technician/research assistant ranked low in comparison to the overall results. Like ESA, the majority of MIS researchers would prefer the scheme to fund more grants. This is surprising given that the majority found that the funding cap and/or the 2 year duration of the grant had restricted their progress. It may be related to the opinion that it is more important to give grants to a greater number of emerging researchers than to give greater resources to fewer.

Physical Sciences and Engineering (PSE):
Around half (2 out of 5) of the PSE researchers thought that the scheme provided adequate support to launch a research career, and the same number did not experience restrictions as a result of the rules of the scheme. Average rankings of the most important elements to fund were very similar to the overall rankings from all subjects combined, except that PhD student funding was ranked above technician/research assistant funding. Three of the 5 said that if the scheme were enlarged it should provide larger grants, and 2 chose more grants. None thought that longer grants were a priority.

Humanities (HUM):
Responses from HUM researchers were similar to the overall population in terms of whether they thought the scheme provided sufficient support and whether the rules restricted their progress: 4 out of 6 said that they thought it provided sufficient support, and 4 out of 7 found that the rules restricted their progress. As in most other areas, the highest ranked item to fund was principal investigator's time, but unlike the total pool of responses, this was closely followed by funding for travel/conference attendance (This is similar to the MIS ranking). Consumables/equipment was the third most highly ranked item, followed by technician/research assistant, PhD student, then Masters student. Outsourced services did not rank at all. HUM researchers were fairly evenly split in choosing whether an enlarged scheme should fund more grants, larger grants or longer grants.

Social Sciences (SOC):
Researchers in the area of SOC appeared to be relatively satisfied with the scheme in comparison to some other subject areas. Nine of the 11 thought that the scheme provided adequate support to launch a research career, and responses were split evenly on whether or not the rules of the scheme had restricted progress. Rankings of the most important elements to fund were similar to the rankings of the overall population, except that Masters students were ranked slightly above PhD students and outsourced services. The majority of SOC researchers (7 out of 12) thought that the scheme should fund more grants, while 3 chose larger grants and 2 chose longer. These results are consistent with the high level of interest in the scheme from social science researchers: Fast-Start applications and grants awarded in this field have made up around 30% of the total in 2001 to 2004.

Recommendations

Enlarge the scheme to fund more Fast-Start grants.
The Fast-Start scheme is highly valued by recipients; it has seeded ongoing research programmes and had a significant impact on recipients' career progression. Interest in the scheme has grown, with a 77% jump in Fast-Start applications in 2004. More recipients chose the funding of more grants as a priority, than chose either longer or larger grants.

Monitor the effect of increasing the size of grants to $70,000 per annum
Fir grants awarded in 2004, the maximum size was increased from $50,000 per year to $70,000. All of the participants in this survey had received their grants before this increase, and many had found it difficult to carry out their research on $50,000 per year. Many were acutely dissatisfied with the extent to which institutional overheads cut into their grants. However, several commented favourably about the increase to $70,000. For the time-being, therefore, the effect of this increase in grant size should be monitored to ascertain whether or not it is redressing the issues raised in this survey.

Consider introducing some flexibility with respect to grant size, particularly in expensive subject areas such as biomedical sciences
More than any other subject area, researchers in the area of biomedical science felt that the scheme did not provide adequate support and that the funding cap and/or short duration of the grants had restricted their progress. These researchers also placed, on average, a high priority on the funding of consumables/equipment. A case could therefore be made for introducing the capacity to tailor Fast-Start grant sizes to the requirements of individual subject areas. One possibility would be to bring in funding level guidelines, but abolish the absolute funding cap.

Appendix – Questionnaire

Page 1 - Welcome

2004 Survey of Marsden Fast-Start Grant Recipients

Welcome to the 2004 survey of Marsden Fast-Start grant recipients. We are surveying 2001, 2002 and 2003 Fast Start recipients to help us to determine the outcomes of the scheme and the ways in which it could be improved.

This survey should take approximately 10-15 minutes to complete.

The survey relates to your Fast-Start project:
xxx

Confidentiality

Your answers will remain confidential to the Royal Society staff analysing the survey. Individual responses will not be placed in contract files or accessed by members of Marsden Fund selection panels.

Results of the survey will be published in aggregate form. Your permission will be sought for the use of any quotes or examples that may identify you.

Survey Instructions

Navigating Through the Survey
You can navigate through the survey using the buttons at the bottom of the page, or the page outline at the top. Answers will be saved if you change pages or press the "Save changes" button.

The "Cancel changes" button will delete any answers that you have not previously saved.

Log-Out
To log out of the survey, use the logout link above.

Survey Time-Out
This survey will time-out if it is inactive for more than one hour. Any unsaved responses will be lost if the survey times out. Please ensure that you save your answers if you are called away.

You may return to the survey and alter your answers any time up until 23 August, 2004.

Thank you for your time!

Page 2 - Questions

For completed grants only:

1. Has your Marsden Fast-Start grant led on to further work since completion of the grant?

yes
no

If yes, please describe briefly the work that it has led to

For all grants:

2. Why did you decide to apply for a Fast-Start grant for this project instead of a standard Marsden grant?

3. Prior to your successful Marsden Fast-Start application, had you applied for any other research grants?

(please exclude prior Fast-Start and individual fellowship/scholarship applications)

yes
no

4. Has your Fast-Start grant influenced your career progression and if so, how?

5. Do you think that the Fast-Start scheme as it is currently configured provides sufficient support for launching a research career?

yes
no

Please comment

6. Did the rules of the scheme (2 year duration, maximum funding cap) restrict your progress on the project in any way?

yes
no

Please comment

7. What do you think are the most important elements for a Fast-Start grant to fund?

(Please rank in order of importance, where 1= most important. You do not need to rank every option, but please assign each number to only one item)

Principal investigator's time
Masters student
PhD student
Technician/research assistant
Consumables/equipment

Outsourced services (e.g. carbon dating, DNA sequencing, etc)
Travel/conference attendance
Other 1, please specify:
Other 2, please specify:

8. If the Marsden Fast-Start scheme were to be enlarged, which ONE of the following do you think would be the most beneficial?
more grants
longer grants
larger grants

9. Are there any other comments in relation to the Marsden Fast-Start scheme that you would like to make?