Defining ‘Early Career’ in Research

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Pat Bazeley

Research Support P/L

pat@researchsupport.com.au

Abstract

In order to ensure the future of high quality research in some disciplines it may be necessary to provide special consideration in prestigious research funding schemes for early career researchers who will otherwise become disenchanted with academic research and leave it behind in their search for a stable and fruitful future. Milestones in progression through research studies and academic life to establishment as an academic researcher are outlined. Within this context, a range of potential criteria for determining promising early career status are reviewed. The discussion leads to derivation of the definition of early career which has been adopted by the Australian Research Council for its prestigious Discovery—Projects grants scheme.

The ‘problem’ of early career researchers

In the highly competitive funding environment of the last decade, a new generation of academic researchers has found it difficult to compete with those who have long since established their credentials, and who are well known to those assessing, advising or making funding decisions. The Australian Research Council (ARC), through its various project grants schemes, is the primary source of funding for basic (non-medical) research in Australia for university researchers. Applications for grants for up to five years are called for on an annual basis. These go through an initial culling by broad discipline panels before being sent for review and scoring by external assessors. They, and the reviews, are then reviewed again by discipline panels where particular attention is paid to those which are ‘at the margins’—typically a set of 40-50 of the original 300 or so applications which are barely distinguishable in terms of assessor scoring and comment and which lie on the funding boundary. Those who win ARC large project grants almost always have a doctoral qualification, a history of involvement in previous ARC grants, and a strong publication record (consistently producing a book and/or several refereed journal articles each year). They also have a better than average chance of obtaining funding if they are in an established research university, and are either of full professorial status (or collaborating with someone who is) or in a research only (rather than teaching and research) position (Bazeley 1998).

Two significant changes in higher education policy have contributed to difficulty experienced by those seeking to break in to the funding cycles: changes in the higher education system brought about a massive increase in the number of academic staff vying for funding, and changes in funding arrangements for research that have meant, on the one hand, decisions are being made centrally rather than at the local university level, and on the other, there is increased pressure to obtain central (or external) project funding.

The introduction of the Unified National System of higher education in Australia in 1989 saw the number of publicly funded universities increase from 19 to 36 as former colleges of advanced education and institutes of technology either amalgamated with older universities or with each other to become universities in their own right. Staff in institutions previously focusing on teaching and professional training became not only able to engage in research, but were actively encouraged to do so. The expectation that academics will engage in research extended not only to the new universities and to new disciplines within the university system, but also to long established professional disciplines in the older universities such as law, accounting, social work, and architecture. Staff across all disciplines

became expected to obtain PhD qualifications (Anderson et al. 1997) and research evidenced in funding replaced scholarship as the primary route to promotion for academic staff.

From 1965 until the present, the allocation of research monies for major projects has moved through a number of changes to take it from a university-based system which was funded through regular operating grants, to a centralised system supported by a 'clawback' of funds from the universities and now administered by the Australian Research Council. The changes were designed to ensure that pure basic research in the sciences and humanities was funded on the basis only of excellence, with equal rigour across and within the universities (Brennan 1993). The consequence is an annual, nationwide 'competition' for funding. And then, the introduction in 1994 of performance based funding for the remaining research component of university operating grants—for which the major indicator is monies already received through external grants—has created increased pressure on all academics (including those whose research does not normally require it) to obtain externally funded research grants from the ARC or industry sources.

There is therefore, on the one hand, an expectation that a significant proportion of academics (most if not all) will conduct quality research, and on the other, limited funds for them to do so. In consequence, not all projects, and indeed not all excellent projects are able to be funded. The Boston Consulting Group, in their report on research infrastructure needs in Australian universities, wrote of the inevitability of there being "winners and losers" with "only the highest achievers [gaining] additional support" (NBEET 1993a, p.24). Increasing pressure on funds available in support of research projects through the large and small individual projects grants schemes operated by the ARC has been evident in the number of applications received and the trend to a decline in success rates for those applications since the commencement of the scheme. The 1989 success rate of 41.5 per cent was sharply eroded (to 24%) in the following year with the influx of applications following university amalgamations. In fluctuations since, the success rate has fallen as low as 19% in some years for the large grants scheme. When the success rate of a scheme falls to less than 30 per cent, applicants are likely to think twice about making the effort to apply (Rip 1993) and indeed, rises in rates following low success years have been more a consequence of a drop in applications than because more money was available.

Given these pressures, it is no surprise that early career investigators frequently face rejection by funding bodies such as the ARC. Without an established track record in attracting research funding and as yet unknown in the research community, new investigators are less able to match established researchers in such a competitive climate. Yet they must compete, and win support, if their potential is to be realised.

A series of discipline based evaluative reviews of grants outcomes and related concerns for the Australian Research Council was set in motion following its restructure in 1988. In at least nine of the reports produced in the early-mid 1990s, the review panel expressed concern that new or younger researchers (e.g. those under 40 years of age) were being severely frustrated in their attempts to establish a research profile in their discipline (NBEET 1993b,c,d,e,f,g; 1994a; 1995a,b). The consequent actual and potential loss of new researchers through emigration or resignation gave rise to a fear that the pool of excellent researchers in some disciplines would not be replaced. Several review panels therefore recommended that there should be a special scheme exclusively for younger, newer researchers, or at least, that they should receive some special consideration for their early but promising career status.

The Research Grants Committee of the ARC concurred with the concerns being expressed. They were supported by Chairs of Discipline Panels who often sought to give special consideration to younger researchers, but found they did not have the necessary information to do so. In response, a study was commissioned to identify the steps which could be taken to ensure the future of Australia's research community through the support of young investigators. A necessary first step was to identify the target group, that is, to develop criteria not only for *early career* status, but to identify *promising* early career researchers for whom support would lead to honing of their skills and development of their contribution to their discipline.

The Australian Research Council is not alone in its concern for promising early career researchers. Indeed, the provision of a special funding scheme for first time independent applicants by the (United States) National Institute of Health (Emery et al. 1992) suggests similar concern. In order to specifically assist these researchers it is first necessary to be able to identify who they are, yet there is no guidance to be found in the literature. With the broadening of higher education in Australia (as elsewhere), this task is complicated by the variety and complexity of paths to a research career, so that labelling academics who have a promising but as yet unrealised research career as 'young' or 'new' ignores those who have come to research later in life or later in their academic career.

The issue and goal for this study, then, was to operationally define 'early career' in a manner suitable for use in determining eligibility for special consideration by granting bodies—in particular, by the Australian Research Council.

Research design

A mixed methods approach drawing on multiple data sources was used to study the pathways taken by researchers in building an academic research career in order to identify the

experiences and characteristics of those with potential to develop as career researchers and to understand those factors which might facilitate or inhibit that career development. This then provided the basis for a review of indicators which could be used to distinguish a promising early career researcher from, on the one hand, one sufficiently established as to not need special consideration, and on the other, one who is unlikely to build productively on their early research experiences.

Primary data sources for this review included:

- Current practice in considering early career researchers by granting agencies was reviewed, particularly those within universities as that is where beginning academic researchers would normally start their search for funds.
- The views and experiences of early career researchers were canvassed through a survey of academics with recently gained or almost completed PhD qualifications. The 296 respondents included academics from six representative disciplines of physics, engineering, psychology, history, nursing and social work (Biglan 1973; Stoecker 1993) and were from a cross section of 12 Australian universities. They represented 62.6% of all those considered eligible within the relevant departments.
- Thirty successful researchers and 52 heads of departments representing this same sample of six disciplines across 12 universities were interviewed.
- A second survey targeted those who had graduated with PhD two years earlier in all disciplines from a cross section of 8 Australian universities. Response from those sent to Australian addresses (some of which were returned from overseas) was 55.4 per cent, making for 190 of the final 208 responses.

Full sample details and methodology for each of these sources can be found in Bazeley et al. (1996).

Milestones in an academic research career

There is no single path to an academic research career, with disciplinary differences being particularly evident in the sequencing of steps. There is wide variation between, for example, the pure scientist who completes doctoral studies, gains postdoctoral research experience as a member of a team, and who then steps onto the ladder of an academic career, and a clinical nurse or teacher with many years of professional experience and quite possibly also many years of academic teaching, who then undertakes PhD candidature and endeavours to build a research profile. The surveys and interviews with academics nevertheless revealed five

common and critical points passed by a would-be academic researcher on their route to becoming established in a research role.

Completion of high level research training

Effective research training provides a mastery of fundamental methodological skills, as well as in-depth substantive knowledge and advanced methodological skills in a particular research area (Bland and Schmitz 1986). The period of training typically also ensures socialisation into the academic profession and to the culture and style of the particular discipline (Becher 1987). The importance of using the training period (doctoral and postdoctoral) to develop associations with distinguished researchers and to establish good scholarly habits has also been demonstrated (Bland and Schmitz 1986).

The extent to which a PhD was viewed as the starting point for an academic career varied across disciplines. In the sciences a PhD was typically necessary to win the most junior academic appointment (Level A)[i], while even highly competitive postdoctoral experience did not provide any guarantees:

> … in the present market it takes more than 5 years postdoctoral experience before you obtain an academic appointment and can seriously consider seeking research funding. I am a physicist who has just attained tenure after more than 8 years as a contracted researcher (including QEII and National Research Fellowships and postdoctoral positions overseas) and 2 years on probation as a lecturer…

In history, too, potential new staff were expected to have both a PhD and a published monograph when applying to an established department, despite there being a number of eminent historians without the same formal qualifications within recent and current university circles.

Academics in the social sciences, in contrast, were much more likely to already be in university employment during their PhD candidature than was the case in either the sciences or the humanities (χ^2=29.70, df=5, p<.001). In the more applied disciplines, industry experience (e.g. in engineering) or community experience (e.g. in social work) were often equally (if not more) valued for new lecturing staff than a research qualification. All academics employed without a PhD, however, experienced pressure to upgrade their qualifications, often including some quite senior staff members with many years teaching experience. In the newer disciplines (e.g. nursing) younger staff members who had completed their PhD often progressed rapidly to senior positions.

Academics who self-defined as early career with regard to research (84% of those surveyed) commonly did so on the basis that they lacked experience, competence and/or confidence to undertake independent projects or that they had not yet completed or only recently completed

their PhD (Table 1). Academics without a PhD lacked confidence in applying for external funding, experiencing uncertainty about their choice of research design and methodology and about budget preparation. They also lacked knowledge about potential sources of funds and funding procedures. Those with a PhD were more likely to apply for external funding than those without a PhD (72.1% compared with 53.5%) and felt hampered only by difficulties in preparing a research budget and by lack of a track record.

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There are, nevertheless, many who complete their PhD but who do not remain active researchers (Bazeley 1999). Data from the survey of PhD graduates suggested that continuing in research some years after graduating had less to do with the particular characteristics of the PhD experience and more to do with personal motivation, having gained additional research experience through working as a research assistant, and building research networks. Graduates who published from their PhD were also more likely than others to continue to be involved in research, particularly if they published as first named author on a joint publication (χ^2=13.99, df=1, p<.001).

University research committees commonly used the recency (or lack of) of PhD qualification as a criterion for defining those eligible for small internally awarded grants designed specifically to provide start-up funding for new academics or new researchers. New academics and those with recent or no doctoral level qualifications were therefore generally able to access such funding for their research, while those who had been qualified with PhD for more than five years were typically expected to gain funding from external sources and were therefore excluded from eligibility from these schemes. Those who were successful in winning ARC project grants (both large and small) were almost always qualified at the doctoral level.

There was common agreement across all sources that the doctorate is a necessary but not sufficient starting point for a promising academic research career. The experience of completing a doctorate provides skill development, builds confidence, and provides the basis for early publications. There is little point in seeking national competitive research funding without a doctoral qualification, even in those fields (such as social work and nursing) where more emphasis at the grass roots university level is likely to be on experience, excellence and relevance in practice rather than on more theoretically oriented research. Those without a doctorate (or an extensive reputation built through equivalent publishing) should more appropriately seek to complete their research training or seek support from industry partners for more applied research.

Obtaining an academic appointment

Those not already in academic employment typically seek an ongoing research position following their doctoral studies. This was seen as being more difficult than obtaining funding for research, as opportunities to access research funding often accompany a position.

While the majority of PhD graduates were in full time work or further study within a short time of graduating, many were unable to find employment which allowed further research or which fostered the development of a career in research, frustrating to those who had spent years pursuing that as their goal. Frustration amongst those who were unable to gain academic employment was most evident in the physical sciences and the humanities, disciplines in which the majority of graduates had to seek new employment and in which the shortage of new academic positions was most acute.

> I cannot convey to you how very disheartening this situation is: to be keen to embark upon an academic career but to be, as so many others are, unable to make a small entrance into a teaching position.
>
> My ambition was to become an academic, but I have now almost given up hope of attaining that goal. Hardly any positions in my field have been advertised in the last four years.

Social science and health graduates were least likely to express problems regarding employment. For the social scientists at least, this was related to their generally being in employment already by the time they graduated with PhD.

The perceived lack of a career structure for young researchers can remain an issue even if employment is obtained. Many seeking academic appointments in particular complained of having to "continually move from institution to institution on contracts lasting one year or less" with consequent impact on ability to apply for research grants. While university internal granting schemes were generally designed to benefit new or recently qualified staff, some required a minimum guaranteed period of continuing employment as a condition for award. In such cases, those on one year appointments or in the last year of a three year appointment found themselves unable to apply for research support at the time when they most needed it.

Lack of security in university employment posed some, considerable or a major problem to their research for 42.5 per cent of the early career academics surveyed while the majority (64.5%) rated the prospects for someone wishing to pursue a research career in their field to be only fair or not good at all. Those in postdoctoral research positions experienced particularly high levels of job insecurity, stating that this was a major problem causing them difficulties in their research or the development of their research career (mean 4.7 on a scale of 1–5). Of the six disciplines specifically studied, physicists consistently rated their employment prospects and future research prospects most poorly ($F=4.63$, $df=5,267$, $p<.001$

and F=3.37, df=5,285, p<.01 respectively), followed by historians, with those in nursing/health being most optimistic. A significant increase in the number of students undertaking higher degree courses in Australia in the last decade and recent budgetary pressure on departments forcing significant reductions in staff and even closures of whole departments, has meant that the academic employment situation has not improved.

It is not only through restriction on access to funding that frequent changes in employment can limit development of an individual's research program:

> I've changed research fields twice since completing my PhD [8 years prior]…With each change comes a dead time, as I move into the field…Changing topics also means I'm never in an area long enough to feel established—I just start to get into the problem, to the interesting stage, when it's time to pack up and move on (Innes 1995, p. 83).

The impact of changing employment on the development of a research profile is particularly strong in the sciences where universities tend to specialise in their choice of research areas. Those coming in are expected to join with an existing research stream, partly as a consequence of equipment needs, and because the nature of scientific research tends to demand a team approach. Even in social sciences and humanities, changes in orientation forced by difficulties in obtaining employment can result in feelings of isolation and sap enthusiasm, as for this university medallist:

> My placement in an education faculty has taken me away from my immediate interests, and I was encouraged to focus on educational research (which I find far less interesting than psychological research)...I have and do participate in research projects but have not played a major role in them. I feel a bit isolated and lack the motivation I used to have.

Academics on short term contracts also experienced more difficulty in building vital research networks than those with more secure positions. Experienced researchers noted the importance of becoming known to potential reviewers and assessors. Networks were seen to open up employment and research opportunities as well as providing a stimulating source of critical discussion of one's ideas.

Time is needed to become established as an academic researcher following completion of PhD candidature or after a research career in industry (or other career interruption). Acceptance of the need for a period of time was reflected in the frequency of its inclusion as a criterion for university start-up funding. Additionally, recency of employment in academia comprised 8.3 per cent of reasons for self-defining as being early career with respect to research (along with being relatively new to working as a researcher for an additional 7.5%). Allowing for start-up and completion of a project and then publication delays, a minimum of five years is likely to be needed to build sufficient track record to be considered nationally competitive for a large grant.

Balancing the demands of teaching with the need/desire to research

Researchers who succeeded in gaining academic employment faced yet another obstacle to the progress of their research career. Many who are highly trained in research, once hired as academics, spend only a small amount of time in research and don't get supervisory support (Bland and Schmitz, 1986). Nineteen per cent of academics self-defining as early career rather than experienced researchers did so because they were focusing on teaching or related administrative responsibilities (15.4% of reasons given).

Older academics noted in interview that new staff in Level A or B positions "get slugged with these huge teaching loads" and "just get thrown in at the deep end, they're teaching and they're just running to stand still." Teaching loads were seen as the major inhibitor of research by recent PhD graduates in academic positions, particularly for those in social sciences and humanities (at 87.2 %). Academic administration also contributed to difficulties in research and publishing for 68.1 per cent of those in social sciences/humanities. In contrast, 41.3 per cent and 32.6 per cent of those in the sciences rated teaching loads and administration (respectively) as inhibiting research, giving funding for research a higher problem rating. Where early career academics reported a lower teaching or administrative load, they recorded correspondingly higher levels of current involvement in research (reduced teaching: $r=.23$, $p<.001$; reduced administration: $r=.24$, $p<.001$).

A Professor in engineering described the level of commitment needed of a new academic to succeed as a researcher:

> So I think life is very tough for young academics that want to make their way in the world and it probably puts a lot of the young people off it too, if people have to work a 70 hour week to get on in the world. But they probably don't realise how absorbing and exciting the research can be as well. It's a question of hard yakka but it's a labour of love. They need to be able to make that time available though, which is tough on their families … because you know by the time you do your teaching, and a bit of administration, and you can't advance your research career if you're only working a 40 hour week. It just won't get you anywhere.

The early career researchers who succeeded despite family and teaching commitments were those who could prioritise and who perhaps also had the confidence to be less than perfect in some areas of their work:

> I think the essence really, is just straight motivation. If someone's motivated, they're going to do it. I mean they are just going to climb mountains and get that money and do it.
>
> Well I have certain days of the week just for research days and it is amazing just how many things that just don't have to be done. So two days a week are teaching days ... so it gave me really two days free to work on research and writing and you have to be ruthless about it, that is just, as far as I am concerned it is my job description to do that. You have to scribble them out in your diary, make

> appointments with yourself ... luckily the guy that had left the job left me all the lecture notes and things like that, there are times to be innovative and there are times be grateful so I just used the material that he had left for me and then worked the two other days of the week on finishing my research.

Early career researchers who were already established as academics had the advantage that they were not having to cope with new responsibilities as teachers at the same time as they were attempting to establish their research career. They may, however, have higher levels of administrative or managerial responsibility than those new to academia.

Applyin*g* for external funding by early career academic researchers was associated with level of personal commitment to research, with enjoyment of challenges in research and with having strong collegial ties. Success in winning funding, however, was associated more with having a stronger track record and knowledge of granting procedures (Bazeley et al. 1996). These requirements for success—learning 'grantsmanship' and building a track record—are often gained through the experience of participation in projects with senior researchers. "There is an established tradition whereby senior people encourage younger researchers by taking them into their projects"—something that is not always appreciated by those accorded the junior status:

> For a genuine dynamic research environment, Australia needs the 'young career researcher' to have the opportunity to genuinely branch out and initiate new research directions (particularly when they have recently come back with first hand knowledge of research directions internationally) rather than be forced to collaborate or continue a 20 year old research tradition of existing staff at the institution in question.

Nevertheless, a highly competitive, peer-review system, such as that operated by the ARC, does not respond favourably to innovative (risky) ideas from unproven researchers.

The career researcher will need to adopt effective time management and collaborative strategies in order, on the one hand, to avoid being overwhelmed by teaching and administrative responsibilities, and on the other, to gain the requisite experience and reputation that will carry them through this stage and on to a successful research career. Building a strong basis for a research career as soon as (or while) these early challenges of teaching responsibilities have been met is vital if later challenges are to be successfully negotiated.

Maintaining a research profile when promotion brings increased non-research responsibilities

At mid-point in an academic career (typically, tenured Level C), teaching and research academics found their time for and commitment to research threatened once again by

increased responsibilities for course design and management and other leadership roles. They must simultaneously cope with seeking larger amounts of competitive research funding from external sources as they become ineligible for smaller university research funding schemes.

Two groups found this period particularly problematic. Senior female academics found they carried a heavy load of university committee memberships, occasioned by affirmative action policies. And in newer departments or disciplines (often but not necessarily in newer universities) the supervisory demands on PhD qualified staff at Level C were particularly acute. An established university department could be quite 'top-heavy' with more professors and associate professors (Levels E and D) than Level A or B lecturers while a newer department might have a quite different profile. For example, a new discipline in an established university had just one Level D professor (who was also head of department) and eight Level C lecturers in a total pool of 60 staff—most of whom were still undertaking their own PhD studies. In such a setting, the few at mid-career levels attracted not only a high administrative loading, but also had almost total responsibility for supervising the research students in the department.

Difficulties in dealing with competing demands in establishing research as part of their academic role are therefore experienced by not only the very junior academic appointees but also by many mid-career Level C tenured staff. Indeed, Over (1996) found that Level C academics in his sample of ARC grant applicants were much less successful (at 17%) than those at either Level B (29%) or level D/E (35%). Academics at Level C are expected to have a sufficiently developed research program to enable them to find external funding. And if they fail to win such funding, their chance of further development as a researcher is greatly diminished, as indicated by one head of department:

> An important problem is the loss of researchers in mid-career, who miss out on funding for more than two years in a row. Often these people are then allocated more teaching responsibilities which precludes them from becoming competitive for research funding again.

There is evidence then of not one, but two critical periods for the teaching and research academic when the development of a successful research profile is under threat. For those on a teaching and research academic path, successful negotiation of this period can establish them in their research career.

Achievement of established researcher status

Gaining and maintaining Australian Research Council (or National Health and Medical Research Council) large grant funding for one's own research is the most significant hurdle

to overcome in becoming established and accepted as a career researcher in academia in Australia.

This step in the research career requires perseverance and resilience in the face of failure and even when this stage has been reached, there is no guarantee of automatic funding. Eighty per cent of applicants have held ARC grants before, yet perhaps only a quarter of those will be successful in any funding round.

> I think it's as devastating at my end as it is at the other end, because at my end you're expected to get it ... and when you miss a grant you find out, these people who've got one, they've missed three, they've gone for four and they don't tell you about the other three until you miss out.

Maintaining funding ensures one's reputation and prestige as a researcher, although not without continuing personal cost as managerial responsibilities inevitably build:

> But we are productive because I work seven days a week, as does [co-researcher], and I think that's the cost, you know, we've decided that we will meet, because this research is important and it is unique and we are committed to it…

Publication output and academic status were each found to independently contribute to a model to predict success in winning ARC large grants (Bazeley 1998). While age, having had previous ARC grants and sponsoring institution were each related to success when considered separately, they did not add to the overall explanatory model.

Limited research experience reflected in having had no grants in the previous 3–5 years, no competitive external grant funding or none over $10 000/$15 000, or no external peer-reviewed grants as chief investigator in past 3 years was commonly used as a criterion for being eligible for new researcher or other internally awarded grants by university granting schemes. Similarly, early career researchers used lack of funding, lack of substantial funding or lack of funding for independent research to define their status (6.7% of reasons given).

Significant, externally won funding for independent research is universally seen as marking the end of the early career period and a sign of being on the way to becoming established (if not already there). This stage is not linked to any particular academic level.

Identifying research potential

From this review of the critical points passed by research oriented academics on their journey from research training through to becoming established in a research career, it is possible to distinguish features which identify
(a) the foundation of a promising research career, and

(b) environmental and other circumstances which particularly inhibit the development of research potential, the presence of which therefore warrants giving special consideration to those affected by them.

Two observable criteria stand out as being essential for success: adequate research training and experience (evidenced in a completed PhD and publications), and stability and security of employment as a basis from which one might build a research program and apply for funding. Motivation, or commitment to the goal, also a necessary component of being 'promising', is less amenable to empirical assessment although it will be evident, for example, when doctoral or project research is turned into publications, in the willingness of the applicant to keep trying until success is achieved or their resourcefulness in seeking alternative sources of funding for their research, and their developing connectedness with a relevant research community.

Difficulty in defining early career status arises from the aforementioned disciplinary differences in patterns of career progression and from the variety of settings in which the definition may need to be applied. A definition appropriate for the ARC's Discovery—Projects scheme (which has replaced the large grants scheme), for example, is likely to allow inclusion of some applicants who would be too advanced to fulfil the criteria, say, for a university early career research award. It is possible, too, for academics with strong industry connections and support to gain funding through the ARC's industry-university collaborative grants scheme (Linkage grants) where they would not succeed in the Discovery grants scheme. A further difficulty lies in setting criteria which can be determined and applied in a restricted administrative setting, that is, criteria that are readily observable.

Criteria which might be considered when determining early career status are discussed and the definition derived is suitable, across the disciplines, for a prestigious granting scheme such as the Australian Research Council's Discovery—Projects. Suggested measurable criteria are designed not only to identify those who are early career, but also, within that group, those who are researchers of promise, that is, with the potential to make a significant research contribution in their chosen area.

Qualification as a criterion

There is little argument that completion of the PhD (or equivalent) is an essential basis for launching a successful academic research career. It is a career achievement which begins to separate research novices from those who may go on as researchers. Its importance lies in what it represents: the completion of a major piece of research to a standard deemed acceptable by the research community which has necessarily involved a major learning

experience about both the topic of the research and (probably more importantly) the process of investigating that topic. As a starting point it is most useful for setting the lower limit in a definition for early career.

Age as a criterion

Age was almost never used as an explicit criterion either by granting bodies or by researchers to describe early career status, but as one of the recent PhD graduates, commenting on the lack of encouragement she had received, remarked: "Although I'm a new researcher, I'm quite elderly and people have high expectations about previous research and publications." The tendency to speak or write of 'young' researchers rather than 'new' researchers (especially noticeable in the ARC discipline review panels) also suggests the application of an implicit age-related criterion.

The age at which one commences a research career is discipline related, with those in the humanities and social sciences often commencing at an older age than those in the sciences. There are those who would argue, also, that maturity is necessary for 'good' research in the humanities, whereas (relative) youth brings some advantage in the sciences. One can argue for the benefit of life experience or the benefit of a long future, in which case age in itself is not useful.

While one could set a limit below which all researchers by default will be early career (e.g. less than 35 years), it is not possible to set an upper limit above which one could assume all researchers are 'mature'. Not enough is known about the longer term career outcomes and research contributions of those who are late starters in research to justify excluding applicants over a certain age from being considered early career on the assumption that they will not have the longevity (in career terms) to develop their work into a significant contribution.

Length or stability of employment as a criterion

It was generally agreed that around five years of research leading to publication is the minimum period needed to become sufficiently established to be able even to start to successfully tackle external competitive grants (allowing for the effect of publications delays, for example). Five years is nevertheless somewhat arbitrary, advantaging those with a greater level of experience prior to gaining their PhD and disadvantaging those who have held a number of disparate short term appointments. Stability of employment is necessary in order to be able to focus on and develop a research program and those in insecure Level A positions were particularly likely to hampered in their research development. When

considering what might make for early career status, then, absolute length of employment is less critical than the length of time one has been in a stable, secure employment situation.

The issue of career interruption

Career interruption is classically thought of as time out by women for raising a family, yet men were almost as likely as women to claim that family responsibilities had inhibited their research and publishing activity after completion of their PhD. Furthermore, there are many other causes of (research) career interruption to consider—the need to return to practice for a time, taking on a heavy administrative load (dean, head of department) or perhaps establishing a new teaching program.

Where an interruption has occurred immediately after completion of PhD, employment history following return to work is a more relevant consideration than date of qualification. Where interruption during the past five years is argued by someone already on a research track (if five years is the relevant period), the most obvious solution to assessing their standing as a researcher is to extend consideration to include their last five years of active research experience.

The research 'track record' as a criterion

Previous research achievements in the form of grants obtained or publications produced are the classic indicators of research capacity, performance and potential. Such achievements say more about the researcher than about the research they might currently be proposing. Having a number of publications or previous funded projects were criteria often applied by university research granting schemes to differentiate more mature researchers from those in need of early career assistance. Researchers themselves used these criteria also in identifying their own status, though they were more likely than the universities to emphasise significant publications, large funded research projects or an international reputation as the point of distinction between being early and more experienced.

Publications

Rather than take a prolific record of research output as an indicator that a researcher should no longer be viewed as early career—which may serve to penalise a *promising* early career researcher—it would be more beneficial to consider the track record as a measure of the level of motivation of the researcher and their capacity to complete research to the point of dissemination. Most candidates will publish in some form during or soon after completion of their PhD and, indeed, unless something is published during the first five years of a career,

then it is unlikely that anything will result at a later time (Lightfield 1971). It may be more appropriate, for those who are within the first years of their career, to consider and make allowances for the type of output that is recorded. In the early years of an academic career, it is likely that a researcher will approach local rather than international journals, and that they will focus more on conference presentations than on refereed articles. Those who have come to academia from other employment may have produced reports or patents rather than books and articles, while some of those coming from industry face the difficulty that their work is commercial-in-confidence and is sealed in company reports.

Previous grants

Given that the accepted approach to gaining a track record in winning grants is to 'piggy back' onto a successful professor or research team, researchers who are endeavouring to establish their own niche in research, to branch out on their own path, may have a record of previous involvement in grants. This does not, however, necessarily mean that they have been directing their own research program, or that they are not early career. Rather than assume that anyone with a record of attaining external funding is not early career, consideration needs to be given to the circumstances under which that funding was obtained. If the funding was won as a solo researcher, or as leader of a research team, it would discount consideration of being early career. The particular difficulty in applying such a criterion is in assessing who is leader of the research team: it may be necessary to deduce this from (a) whether the researcher in question was the most senior person on the team, in terms of academic appointment, (b) their position in the list of chief investigators, and/or (c) their position in lists of publications resulting from the earlier project.

The need for a track record

If an early career researcher is applying for significant external funding, such as that provided through large ARC grants, it is reasonable to expect that they need to demonstrate having managed previous funding (albeit a small amount) and more particularly, that they have produced outcomes from their previous projects before being considered eligible to manage a large grant. Thus a track record should still be expected of an early career researcher (as an indicator of 'promise'), but with expectations moderated regarding the nature of that track record.

A definition for early career

In order to satisfy the needs of the ARC project grants scheme across the range of disciplines and taking into consideration the most critical of those factors outlined above, early career status can most simply be defined as follows:

> *An early career researcher is one who is currently within their first five years of academic or other research-related employment allowing uninterrupted, stable research development following completion of their postgraduate research training.*

This definition assumes that completion of postgraduate research training (typically, PhD) is an essential foundation to build on, and that five years is sufficient time in which to begin to build a track record, assuming stability of employment sufficient to allow development of a personal research program. It does not discriminate on age, and allows for the quite different tracks in different disciplines where, on the one hand, the PhD might be followed by a period of instability, and on the other, where there has been lengthy employment but with a non-research focus until PhD studies were begun. Unlike internal grants schemes, it does not discriminate on previous grants experience or on numbers of publications, on the basis that the first of these is dealt with by the five-year restriction (their track record will not be totally secure during that period, even if they are working on large grants) and the second is a sign of promise rather than a sign that they don't need special consideration.

Assessing early career status

It is possible to detail the information which needs to be provided if early career status is to be assessed. No piece of information on its own, other than relative youth (say, less than 35 years), is sufficient to determine if someone is early career. In assessing the status of any particular researcher, therefore, review panels need to take a number of factors into account in making their judgements.

The information for each individual investigator involved in a project which is needed to ascertain (promising) early career status might then include:

- research qualification;
- year in which research qualification was obtained;
- current position, including year and level of appointment;
- year of first non-casual appointment to an academic institution or research organisation;
- year of first non-casual appointment in the current place of employment;

- significant periods of absence from a research environment after qualification with PhD—with the period or periods specified by year, and considered not relevant if prior to the last five years;
- number, duration and type of research fellowships which have been held;
- position with respect to grants held during past five years, or, where career interruption is being claimed, during the most recent five years of research activity; and
- research output during the past five years, or, where career interruption is being claimed, during or resulting from the most recent five years of research activity.

Age and discipline may provide useful contextual information.

Much of this information is collected on the application form as a matter of course. The remainder can be assessed from a brief open-response account of the basis on which early career status is being claimed.

Implementation

The ARC adopted this definition for determining early career researcher status when reviewing applications for funding under its project grants scheme. Additional recommendations of benefit to early career researchers which were implemented related to the number of concurrent grants which could be held by any listed chief investigator.

Applicants to the scheme could apply for priority status on the basis of being early career. Priority status meant that, in differentiating projects which were at the margin of funding—those that are indistinguishable on other criteria—preference in allocating funding would be given to an early career applicant over a more established researcher. In the first year this was applied, teams including an early career researcher could apply for priority, as well as solo researchers. There appeared, in consequence, to be simply a reordering of the named applicants in many team projects, with the early career researcher placed first in the list rather than last. The early career researcher was not necessarily in any better position to advance their own research ideas, and so many applications met the criteria that it lost its effectiveness. In the following years, teams applying for early career priority status were required to be composed entirely of early career researchers (as had been recommended in the original report). Under these arrangements, the success rate for early career researchers for grants commencing in 2000 was 15 per cent, compared with a rate of 22 per cent overall.

Under the New National Competitive Research Grants Scheme a proportion of funding for project grants has been set aside for early career researchers only. Where all investigators on

an application meet the appropriate criteria, applications from early career researchers are assessed separately from mainstream applications. In the first round of funding (for 2002), 161 of the 653 early career applications were successful (24.7%), attracting 7 per cent of the funding allocated. Their success rate compares favourably with the overall rate of 25.6 per cent. In addition, there is no longer a marked discrepancy in overall success rates based on age group.

In the most recent ARC guidelines, the definition of early career has been modified to *not* specifically take account of difficulties in finding a secure employment base to research from, despite the employment situation having worsened rather than improved since the category of early career has been introduced. Thus, for grants submitted in March, 2002:

> The primary definition of an Early Career Researcher is one holding a PhD, or equivalent research doctorate, awarded since 1 March 1997. Applicants not satisfying this definition who wish to claim ECR status must present their case within their application. Circumstances establishing ECR status beyond the primary definition could include career interruptions due to non-research employment, misadventure or carer responsibilities, or a research career not preceded by the award of a PhD or equivalent research doctorate.

There has, nevertheless, been a 33 per cent increase over the previous year in the number of applications received for funding from early career researchers, continuing the trend of increasing interest from this academic group.

At the other end of the spectrum, a scheme of high status Federation Fellowships has been introduced to attract up to 25 internationally competitive researchers or research teams to either remain in Australia or return to Australia, as another way of addressing the 'brain drain' from Australia to other countries. First awards under this scheme were made to 15 researchers (from 182 applications) in 2002 in physical, biomedical and social science.

In conclusion

Being a promising early career researcher is well advanced from being a beginner in research. The promising early career researcher will have already demonstrated that they have the persistence and research skills required to complete a major independent research project, and to disseminate the results from that project. Building a research career in academia requires continuing dedication and persistence to counter the distractions and pressures of academic life more generally or the insecurity of a primarily research position. And while one might expect that being early career implies being young, in the humanities and social sciences, and particularly in professionally oriented disciplines, it is likely that many of those who are potentially (but not yet) making significant research contributions are

building on many years of alternative experience before coming to research or to academic life.

The ARC has shown its commitment to early career researchers by considering and initiating schemes to enhance their opportunities to build a career in academic research. This has already had an impact on comparative success rates for younger researchers at least. What impact this has had on the retention and development of researchers within the academic environment is, as yet, not known. What is known is that enthusiastic researchers will continue to be lost to academic life in an environment of increasingly restricted government funding support for and casualisation of the higher education sector, preferring to move on to industry, business or overseas—or lost within academic life as they are deflected by other duties.

The opportunity to explore new directions in basic or basic-strategic research provided specifically through support of academic researchers by the Australian Research Council may not lead to an immediate economic or social benefit but may eventually lead to breakthroughs in knowledge with consequent economic or social benefits. To insure against loss of this potential, a full understanding of the factors affecting career development in research is both needed and needs to be carefully considered—at the local level in workplace agreements affecting opportunities to effectively engage in research, and at the national level in the development of criteria for support for research. The achievement of this study was in laying the foundation for the latter. Much remains to be achieved with respect to the former, and in evaluating the impact of changes which have promoted the interests of early career researchers.

Endnotes

[1] Academic appointments in Australia are available at five levels:
Level A – Associate lecturer (previously tutor)
Level B – Lecturer
Level C – Senior Lecturer
Level D – Associate Professor
Level E – Professor

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Table 1: Reasons for academics self-defining as early career with respect to research

Reason	N responses	% of responses
training incomplete	30	12.5
recent PhD	26	10.8
late starter	8	3.3
career interruption	12	5.0
no (large) funding	16	6.7
limited publication/reputation	30	12.5
taking new development/direction	12	5.0
limited expertise/confidence	21	8.8
recent researcher	18	7.5
recent academic	20	8.3
insecure employment	10	4.2
other orientation (primarily teaching)	37	15.4

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Level A – Associate lecturer (previously tutor)
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