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Referees or sponsors? The role of evaluators in the promotion of research scientists in a public research organization

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Abstract

Evaluators play a central role in assessments of researchers' performance for reward, but the nature of their role and influence is not well understood. Ongoing reliance on evaluator judgement is typically justified as a need for referees in contests for reward, because quantitative performance measures alone can be subject to distortion. Yet, if evaluators are able to privately establish or interpret the performance standards utilized in evaluation, it may inhibit equality of opportunity, limit applicant pools, and reinforce existing inequalities. This article untangles the different roles played by evaluators through the development of a typology of systems of performance evaluation from existing literature. The typology is then applied to one type of evaluation system—promotion in a public research organization (PRO)—to investigate how and why particular evaluator roles emerge, and what contextual factors influence their implementation. Data are drawn from a mixed-method case study of a large Australian PRO, which includes data from one focus group, 22 in-depth interviews and 803 survey responses. The case study finds that evaluators' role can extend to sponsorship of researchers through the promotion system when diversity in research specializations inhibits the establishment of uniform performance standards. It also demonstrates that reporting lines and evaluator workload impact how and to whom sponsoring support is given.

Key words: researcher evaluation; typology; promotion; public research organization; sponsorship.

1. Introduction

The role of evaluators in assessments of researchers and their work is important because it effects the efficacy and equity of outcomes. Of particular significance is whether evaluators' role includes the authority to privately establish or interpret the performance standards utilized in evaluation; such authority can inhibit equality of opportunity, limit application pools, and reinforce the existing social order. This article examines the role of evaluators in assessments of researchers' performance. It first reviews the literature on evaluator roles in performance evaluations for all types of professional reward to develop a typology, and then focuses on one specific type of professional reward—promotion—to apply the typology through a case study analysis. The terms 'research science' and 'researcher' are used to describe the profession and professionals, respectively, that conduct research primarily for the purpose of public knowledge generation.

There has been a growing use of publicly established performance measures in the professional reward system in research science; yet, most evaluations continue to rely heavily on the private judgement of evaluators (Moed 2007; Lamont 2012; Hammarfelt and Rushforth 2017). This continued reliance is typically justified as a need for referees in contests for reward, because quantitative measures and bibliometrics alone can be open to gaming (Waltman and van Eck 2012; Tourish and Willmott 2015). There is validity in this assertion; yet, there is also evidence that evaluators privately interpret, contest, and in some instances, reject publicly established

standards when making their own judgements (Lamont and Huutoniemi 2011; Reale and Zinilli 2017), meaning that their role is more expansive than refereeing pre-defined rules. In organizational contexts particularly, formal evaluation systems for appointment and promotion can be under-developed and/or lacking transparency (Roth and Sonnert 2011; Fox 2015), leaving evaluators significant scope for private determinations.

The absence or neglect of publicly established performance standards often grants scope for evaluators to nominate or support pre-selected individuals for reward. A substantial literature illustrates the biases that can occur in judgement-based assessments by panels and professional or organizational authority holders such as journal editors and heads of department; in particular, disadvantage is experienced by those with research agendas dissimilar to or in conflict with those of evaluators (Mahoney 1977; Ernst, Resch and Uher 1992; Shapin 1994; Lamont and Huutoniemi 2011), and by women and ethnic minorities (Long and Fox 1995; Fox 2001; Bornmann, Mutz and Daniel 2007; van den Brink 2010). In circumstances where evaluators can nominate individuals for reward or support their informed application, a private, pre-assessment is occurring, as evaluators survey the field for favoured candidates before the formal contest is opened. In these situations, unfavoured groups experience double disadvantage, as are less likely to be selected or supported for consideration in addition to their lower likelihood of favourable evaluation. van den Brink (2010), for example, found that over 50% of professorial positions in The Netherlands were filled without an open contest. In closed appointments women were significantly less likely to be hired than in open ones. More conceptual attention is needed to advance understanding of the roles played by evaluators in different reward systems. This is the purpose of this article.

The article uses literature on research evaluation to build upon sociologist Turner's (1960) theoretical framework of social control of mobility and develop a typology of performance evaluation systems in research science and the evaluator role they generate. It then applies the typology to one particular form of performance evaluation system—promotion in a public research organization (PRO)—to investigate how and why particular evaluator roles emerge, and the implications for efficacy and equity of evaluation outcomes. Promotion systems are the sites in which researchers' career advancement is explicitly negotiated, making them an important topic of study. The case organization is a large, multidisciplinary PRO, making it a valuable site for the study, as it is illustrative of the complexity inherent in performance evaluation in a research environment covering a wide range of disciplines. The following section presents Turner's theoretical framework and explains how his framework was extended to develop the typology of evaluators' roles. The research design and case context is then presented, followed by the analysis of findings. A conclusion completes the article.

2. Theoretical framework

Turner (1960) proposed the existence of two core systems through which social mobility is controlled: sponsorship and contest. He argued that social mobility is achieved through sponsorship when existing social elites control knowledge about status credentials and selectively transfer status to protect the existing social order. Social mobility is achieved through contest when status credentials are public knowledge and can be contested by anyone. In sponsored mobility, only those selected and groomed by existing elites will themselves reach elite strata. Systems of sponsored mobility do not offer equality of opportunity and reinforce existing patterns of stratification. In contest mobility, existing elites do not have the authority to determine mobility and are themselves at risk of supersedence by more able competitors. Turner noted that in reality, many systems will consist of both sponsorship and contest mobility controls but did not seek to explore such hybrid models.

The concept of social control upon which Turner's framework is based has been criticized as too simplistic and socialized an explanation of social mobility (Emirbayer and Goodwin 1994; Barnes 1995; Holmwood 2005). His framework has, however, demonstrated explanatory capability in studies of career mobility in organizational employment (Sheridan et al. 1990; Sparrow and Liden 1997; Wayne et al. 1999; Myung, Loeb and Horng 2011), including the employment of research scientists (Hargens and Hagstrom 1967; Zuckerman 1977; Reskin 1979; Cameron and Blackburn 1981; Becher and Trowler 2001; Miller, Glick and Cardinal 2005). Similarly to Turner, however, these studies apply his framework as two binary alternatives rather than seeking to examine how features of both contest and sponsored mobility may interact to generate advancement outcomes. All contemporary career mobility systems must be under-pinned by the principles of contest mobility to maintain legitimacy with employees (Lemons and Jones 2001), so if acts of sponsorship are identified, they must be enacted within some broader context of a merit-based contest. This is particularly so in research science, as a profession that espouses a merit-based reward system as central to its legitimacy in knowledge production and dissemination (Merton 1973).

Applications of Turner's framework in the study of research scientists have largely been conducted at the profession, rather than the organizational level. In this context, sponsorship has been widely presented as an explanation for mobility in recognition of the hierarchical nature of the profession and the gatekeeper role played by professional authority holders such as journal editors and reward panels (Hargens and Hagstrom 1967; Zuckerman 1977; Reskin 1979; Cameron and Blackburn 1981; Becher and Trowler 2001; Miller et al. 2005). Supervision by an elite research scientist during doctoral education has also been identified as the primary predictor of subsequent rates of career advancement amongst research students, regardless of subsequent productivity (Zuckerman 1977; Reskin 1979).

These applications of Turner's framework evidence its relevance but suffer from two key limitations: first, as discussed, they do not examine how both sponsorship and contest mechanisms interact to generate system outcomes. Second, the studies adopt a range of measures and interpretations in applying Turner's framework, none of which are clearly tied to specific features of, or activities within, the evaluation process. The following section uses Turner's framework and literature on methods of evaluation for professional reward to develop a typology of evaluation systems based on the specific features and activities, namely, evaluation criteria and the evaluation process.

2.1 Typology of evaluator control

Central to Turner's theoretical framework is whether social elites privately determine the standards for advancement and reward prospective contestants, or standards are publicly known and contests publicly observable. Applied to evaluations in research science, the defining factors will be (1) whether the performance standards (evaluation criteria) required for success are public or private

knowledge, and (2) whether the process of evaluation is publicly observable or conducted privately. A review of the literature on methods of performance evaluation of research scientists suggests four archetypal systems based on these defining factors—two dominated by privacy as characteristic of sponsored mobility and two dominated by publicity as characteristic of contest mobility.

The first archetypal system is the purest form of sponsorship utilized in evaluating research scientists' performance for reward and is typical of the traditional model of evaluation within the profession. In this system, evaluators survey their field for candidates without publishing evaluation criteria or opening the reward to contestants; they then nominate and select the most worthy individuals based on their own discretionary judgement. This system of closed nomination and private evaluation remains in use in many prestigious awards and is a common method of evaluation for senior and 'distinguished' appointments (van den Brink 2010; UTS 2018). In this system, evaluators' role can be classified as a 'sponsor', as they hold the authority to privately establish and apply the standards for evaluation and hence directly select individuals for consideration and reward.

As part of a broader push to improve fairness and accountability in professional reward allocation, most evaluation systems in research science now utilize formal evaluation criteria while retaining the use of discretionary judgement in evaluation (Hammarfelt and Rushforth 2017). This push has led to the creation of the second and third archetypal evaluator roles, which are embedded in hybrid systems involving both sponsorship and contest controls. In this context, the scale of evaluator influence is primarily determined by whether they hold the authority to privately establish their own interpretation of generic standards.

The second archetypal system is the 'sponsored contest'. In this system, evaluation criteria are publicly designated but are vague, based on overly general criterion such as 'research excellence'. This generality grants scope for private interpretation of criterion by evaluators. In such contexts, potential contestants are not publicly provided with complete and equal knowledge about how their performance will be evaluated for reward. Evaluators may selectively share their privileged knowledge about how they interpret these general standards, thus enabling the success of some and not others. Discretionary communication of performance standards has been identified in promotion systems with absent or ill-defined criteria. In these systems, women and ethnic minorities are less likely to access knowledge about evaluation criteria as are those less connected with the Anglo male-dominated social networks of evaluators. Individuals with incomplete knowledge of evaluation criteria are less likely to apply for reward, which can limit applicant pools to those connected to evaluators (Long and Fox 1995; Fox 2010; Roth and Sonnert 2011). As evaluators hold indirect sponsorship capacity in their ability to share privileged knowledge about the performance standards, their role can be classified as an 'enabler'.

The third archetypal evaluation system, and the one often posed as the intended or ideal, can be labelled a 'refereed contest'. This system continues to employ evaluator assessment of publicly established standards but achieves sufficient transparency in the evaluation process that it prevents the existence of privileged knowledge about the basis for reward. This transparency is often achieved retrospectively, through the publication of evaluation deliberations to ensure that evaluators are not able to interpret or apply standards of performance differing from the prevailing public interpretation (Fox 2015). This system better enables equality of opportunity than sponsorship-based systems, as criteria are publicly established and transparently applied. By preventing inequality in knowledge of criteria, this system addresses the key weakness of the sponsored contest and enlarges the applicant pool. By retaining the judgement of evaluators as the primary evaluation mechanism, however, the biases inherent in human decision-making remain. Scepticism of evaluation fairness may still limit the applicant pool (Lemons and Jones 2001), but to a lesser degree than incomplete knowledge of evaluation criteria. Many grant evaluations are illustrative of this system as publicize outcomes in addition to formal criteria. Outcome data reveal any unwritten criteria that may affect evaluations such as the need for principal investigator experience in grants (Reale and Zinilli 2017). In this system, evaluators' role can be classified as one of a 'referee'.

The fourth archetypal system is the 'self-governed contest'. It is the least common but most open form of evaluation and entails formal criteria upon which evaluation can be standardized. The achievement of the established standards, for example particular research metrics or income generation targets, automatically results in award. Such systems are used sporadically, although some in particularly impactful evaluations, such as those for the provision of research block research funding to Australian universities (Australian Department of Education and Training 2018). Metric-based evaluations are the subject of both criticism and concern amongst many scholars for establishing perverse incentives for particular types of research to be conducted at the expense of others (Muller and de Rijcke 2017). This type of system is, however, useful for garnering trust in evaluation objectivity, which can be inhibited when evaluation is reliant on human judgement. There is no requirement for human evaluation, so those traditionally holding evaluator positions in this system can be classified as an 'observer'.

These four archetypal systems and the role they designate evaluators are summarized in Table 1 below. The table depicts how evaluators' role will vary depending on the nature and scope of control they hold over the criteria upon which evaluation are conducted and the process of evaluation. All these roles are currently in use in different systems of evaluation in research science; different evaluation methods are used at different times, both across reward categories and within them.

This typology can support the identification of design factors that may inhibit the contestability of a reward under evaluation or limit the applicant pool through biased pre-selection or inadequate knowledge of criteria. For its application to be most effective requires the investigation of both administrative design of the system and its enactment in practice. This is necessary as initiatives aimed at improving fairness and accountability in evaluations have had varying degrees of impact, as research scientists often view the imposition of bureaucratic controls as an impediment to their autonomy and resist, circumvent, or ignore imposed criteria (Anderson 2008; Reale and Zinilli 2017). Consistent evaluation and reward systems are also difficult to implement in research science due to disciplinary diversity and structural decentralization at both professional and organizational levels (Fox 2015). Furthermore, if elements of sponsorship are identified, it is important to understand the factors influencing how and to whom sponsor support may be provided. The following section will present the research design for the study to illustrate how data were collected on the formal design and actual functioning of the evaluation system for promotion at PRO.

3. Research design

To test the proposed typology, this study used a case study design (Yin 1989) involving one focus group, 22 in-depth interviews, and 803 survey responses, and analysis of administrative data about the

Table 1. Systems of evaluation in research science

Mobility system	Evaluator role	Evaluation criteria	Evaluation process
Sponsorship	Sponsor	No publicized criteria	Private assessment by evaluator(s)
Sponsored contest	Enabler	Evaluators(s) have privileged knowledge about publicized evaluation criteria	Evaluators(s) privately assess candidates against publicized criteria
Refereed contest	Referee	No individual has privileged knowledge about evaluation criteria	Evaluators(s) publicly assess candidates against publicized criteria
Self-governed contest	Observer	No individual has privileged knowledge about evaluation criteria	Evaluation is automated

evaluation system for promotion in the case organization. The study was designed to develop a detailed understanding of the system's design and research scientists', including evaluators', experiences of and attitudes towards the system of evaluation for promotion within the case organization. Further details about the case organization, system of promotion and pattern of careers within it are provided in the Study context, section 3.1.

The first stage of data collection was an exploratory focus group involving four participants. Focus groups offer an opportunity to gain an insight into the nature, language, and key issues in the context of study (Finch and Lewis 2003). In this study, the focus group sought to develop the authors' general understanding of research scientists' perspectives of the structure, terminology, and key issues involved in the promotion system. The interview component of this study was designed to collect contextual, explanatory data (Ritchie et al. 2013) to evaluate the typology from research scientists' perspective. To achieve this objective, semi-structured interviews based on open questions were conducted. This allowed the authors to guide the topic of discussion while maintaining flexibility in discussion to allow the research participant to introduce relevant or expanded interpretations of the subject matter. Open questions put the onus on research participants to supply the content of the answer, hence allowing for a stronger participant voice (Patton 2005). Purposive sampling was employed so as to recruit participants from across the salary structure of the case study organization and to include in supervisors with evaluation responsibilities. All qualitative data were transcribed verbatim, and data analysis was conducted using NVivo software and thematic analysis. This method of analysis allows for the identification of recurrent and emerging themes from research participants through a data coding process.

Survey data were collected on factors more easily reported quantitatively such as working hours, or factors that can benefit from scale ratings such as attitudes and frequency of interaction with supervisors. Attitudinal items were rated on a five-point Likert scale (strongly agree to strongly disagree). Demographic data were also sought, along with salary level and management responsibility. Space was also provided for open-ended comment at the end of the survey. Administrative data about the evaluation system were collected from organizational policy on promotion and performance evaluation.

Primary data were collected with in-kind support from the PRO union for research logistics. The responses of 803 research scientists were received (response rate 49%), including 274 comments. The survey population was biased towards union members, with 63% of respondents members compared with 47% in the overall staff population. Analysis of survey responses did not, however, find significant differences between members' and non-members' responses regarding evaluation processes or criteria.

3.1 Study context

PRO is a large, multidisciplinary PRO with a focus on hard sciences. There are different job and career options for qualified scientists within the organization, including roles focused on commercialization or administration. This article focuses on those classified as 'research scientists', whose role is to conduct primary research, including through external grant funding and to generate research outputs including peer-reviewed publications. The organization has an applied research mandate to generate output beneficial to public and industry stakeholders. This restricts research scientists' autonomy to identify research topics independently. It also means that these scientists conduct research resulting in output that is not peer-reviewed such as government or industry reports in addition to work for peer-reviewed publication. As a result, PRO scientists' overall research output is not as measureable as in universities using standardized research metrics due to the absence of standardized research metrics for non-peer-reviewed research output. Although PRO scientists collaborate externally and can secure external funding, the majority of research is conducted wholly internally under a hierarchical structure. Administrative responsibilities increase as they advance up the career ladder, with mid-career scientists typically responsible for project management and senior scientists responsible for the management of research groups/themes and performance evaluation.

PRO has five core salary levels and one higher level for the senior research administrators. Based on survey data, mid-career levels are the most populous in terms of staff numbers, although the highest core salary level is still 75% of mid-career levels, highlighting a reasonably even distribution across ranks. Many PRO research scientists spend the bulk of their careers with the organization; the median length of employment of senior research scientists in the survey data was 22 years. Analysis of age and salary data in the survey shows a linear relationship between the two variables, with a 5-year difference in average age and similar SD at each salary level up the career ladder. Most PRO scientists are permanent employees (80% of the survey sample was permanent). This differs from Australian universities, in which only 36% of research scientists are permanently employed (Goodman et al. 2016) and serves as an incentive for recruitment and retention.

The PRO promotion system is typical of those in the Australian public research sector, in which individuals seeking advancement submit an application for promotion that is deliberated by a reward panel. The operating principles of the promotion system are specified in the organization's enterprise agreement (EA), with further details outlined in centralized human resource policy. The EA is a formal employment agreement covering all staff that is developed by central organizational management in consultation with union

bodies and employee representatives. The PRO EA specifies that promotion may be granted to an employee if the reward panel determines that 'An officer has a sustained record of achievement that clearly demonstrates the requirements defined for the next [salary] level in the relevant [professional] classification standards, and that the organisation requires the role performed at a higher level into the future' (Public Research Organisation 2011: 32).

To be eligible for promotion, an individual needed to complete, and demonstrate performance within, an Annual Performance Agreement (APA). The APA involved the generation of performance targets for the coming year through a collaborative process between an individual research scientist and their supervisor. A range of sample objectives was published for each salary level that could be used to guide level-specific objectives. At the end of the cycle, individual performance was assessed by supervisors against the objectives established for the year. Supervisory approval was in the first instance required for an application for promotion to be lodged by staff at or below mid-career level, although an appeals process allowed individuals to apply without supervisory support. Applications at these levels were evaluated by a panel of senior scientists, including the departmental head, from within the individual's department. Applications could be submitted independently at senior scientist levels and were assessed by a panel of senior scientists and departmental heads from across multiple research departments. Applications for the most senior scientist and senior scientific administrator levels were deliberated by all research department heads as well as certain administrators such as the CEO. Panel composition was largely fixed, particularly for senior appointments, but fixed in terms of position rather than person, e.g. departmental head and CEO. A representative from human resources would also be present. Successful applicants' names were published along with the reasons for their advancement.

4. Evaluation for promotion

To explore overall perceptions of the promotion system, interview participants were initially asked to describe how the system worked. This allowed for participants' perspectives to be captured unguided, and allowed the role of formal and informal mechanisms to emerge from participant narratives. Research participants were largely unified in the perspective that promotion was under-pinned by performance and that the system was formally operationalized in accordance with administrative policy. This confirms the presence of fundamental principles of contest mobility, as promotion was performance based and open to all staff. The formal evaluation policy was, however, reported as serving as a framework for evaluations rather than a self-governing system. As illustrated in the quote below, research scientists largely saw performance as a minimum requirement for reward but job-based performance alone was not seen to guarantee the ultimate success of individuals' promotion aspirations.

> *. . . it's true that you have to be good at what you are doing to get promoted. That's the first requirement. But from there to actually getting the promotion done depends on a lot of factors. So just because you have a good publication record or you are doing a good job, does not mean that you are going to get promoted. (Senior male interview participant)*

APA supervisors were seen as the linchpin of the promotion system by many. APA supervisors played a significant role in the performance evaluation system as co-determinants of performance objectives and the primary evaluators of research scientists' performance. Many research participants reported that the significance of APA supervisors in subordinates' evaluation success extended beyond the benign role outlined in formal policy. Some research scientists holding this perspective were sceptical of the system's objectivity and viewed the discretion held by APA supervisors in evaluations of promotion worthiness as inhibiting contestability. As illustrated in the quote below, a positive APA was viewed as a foundational requirement for promotion, but supervisory support and/or advocacy above and beyond 'ticking the box' was a more powerful determinant of outcomes. This suggests that the evaluation conducted at the panel level may be a secondary evaluation based on supervisor's assessment rather than a primary evaluation of candidates' performance.

> *The promotion system works partly by having a good supervisor. Because unless you have a good supervisor. . . you're not going to get [promoted]. I know one guy, who shouldn't be where he is, but he had a truly crappy supervisor for many years and that's why he is where he is. Having a good APA helps, because unless you have a documented APA, you're not going to get the case forward. But it doesn't matter how good an APA you have, if you don't have a good supervisor, it's not going to get through. (Senior female interview participant)*

Dependence on supervisory support for promotion success has significant implications for the equity of advancement opportunities. The quote above suggests that a lack of active support from a supervisor could undermine a research scientist's prospects for promotion. This suggests that supervisors had scope to sponsor subordinates' for promotion. Commentary from supervisors reinforces this perspective and illustrates that advocacy to promotion panels through the preparation of a supporting case was the primary mechanism through which this sponsorship could occur. Although it was acknowledged that promotion cases needed to be grounded in good performance, there was a widespread belief that the persuasiveness of the support provided by an individual's supervisor impacted promotion application success, as illustrated in a supervisor's comment below.

> *If you can write a good case you can get anybody up but if you can't write a case, if a supervisor doesn't know how to write a [promotion] case, then you're in trouble from the start. So it's people dependant. (Senior male interview participant)*

The significance of supervisors' evaluation of promotion worthiness on reward panel outcomes may be a form of the deferral to 'expert opinion' identified in previous research on panel-based evaluation. In absence of professional, disciplinary, or personal familiarity, panel members can feel ill-equipped to perform an effective evaluation and default to the interpretation of a single panel member deemed to hold the relevant specialist knowledge (Lamont and Huutoniemi 2011). Such deference, while understandable, erodes the equity protecting mechanisms of panel-based evaluation.

Supervisors also discussed the political nature of promotions within work groups and the need to manage expectations for advancement. Interestingly, a number of supervisors discussed the need to support subordinates' career advancement to ensure their continued motivation and productivity in group project work. This is a feature of the structure of much contemporary hard science research which relies on large team collaboration. The quote from a supervisor below illustrates that the sense of dependency between supervisor and subordinate could be mutual.

The other cases where, and also it all depends on a person concerned, that if a [staff member] screams that 'I want to be on level…' whatever, unless you keep that [staff member] happy, your work is not going to get done. So supervisors are forced to come up with a promotion case and get that promotion through. (Senior female interview participant)

Although supervisors generally expressed confidence in facilitating the successful promotion of well-performing subordinates, two examples were provided in interviews of support from an APA supervisor being insufficient. The interviewees presenting these examples believed that an advocate on the promotion panel itself was needed to secure advancement. The capacity for an individual promotion panellist to influence reward outcomes is a documented weakness of panel-based decision-making in research science. A particularly persuasive or influential panel member may change the original position of other panellists. This problem is exacerbated in multidisciplinary evaluation panels when panellists may default to a single disciplinary specialist for guidance (Lamont and Huutoniemi 2011).

…she is a brilliant research scientist and you know, her supervisor who she used to have her definitely thinks that she's up for it, and supported her and her supervisor there supported her, but the people above decided that she wasn't worthy of it, and so to me it demonstrates how much in PRO, and I suppose it probably exists in other places, that if you don't have someone in the promotion committee to bat and to really put your case forward, then you could be as skilled or as competent as you want, but you could still be stuck you know… without progressing. (Mid-career female interview participant)

A perception of discretion in decision-making held by evaluators at both the supervisor and reward panel levels was a source of discontent for research scientists seeking certainty of promotion requirements. Research scientists perceiving inadequacies in the quality or quantity of supervisory support in the promotion system could be frustrated and/or resentful. The quote below illustrates the scale of dependence some research scientists felt for supervisors to facilitate staff promotion. It also illustrates a perception of a lack of accountability for poor supervisory performance.

I particularly see supervisors who have failed over and over and over again in their responsibilities to support their staff being promoted. Some people are very good at promoting themselves upward… and because there is no voice below and you keep that voice subjugated in some way and make it look like everything's going smoothly and just yourself promote upwards and up you go. (Mid-career female interview participant)

The median length of employment of senior research scientists at PRO was 22 years, suggesting that internal promotion was a key mechanism for filling senior roles. For some research participants, the internal promotion system at senior research scientist levels was a means of control and exclusion. The demographics of senior research scientist ranks generally, and of evaluators particularly, influence the equity of promotion outcomes. A dominance of Anglo males in managerial positions opens performance and promotion processes to gender and racial biases (Long and Fox 1995; Bornmann and Daniel 2005). This risk is applicable to PRO; amongst survey respondents, Anglo male research scientists held 81% of supervisory positions and 83% of leadership positions. Female research participants perceiving gender bias in the promotion system expressed the highest levels of scepticism about evaluation objectivity.

Promotions at high levels are not open and competitive—not externally advertised—all internal—women not encouraged. (Mid-career female survey respondent)

There were also gender elements in PRO research scientists' confidence to self-advocate to evaluators for promotion, which is consistent with existing research about low levels of self-promotion confidence among women. Female research scientists are less likely to apply for promotion, less confident in their ability to meet promotion criteria, and less comfortable with self-promotion (Aisenberg and Harrington 1988; Bagilhole 1995; Bagilhole and Goode 2001). The following quote provides an example of this, with a junior female research scientist describing her intention to apply for advancement solely because of supervisory support.

I feel really lucky in that there's a [higher level position] being offered at the moment, which I'm thinking about applying for, but the only reason that I would consider doing it, [because it's] a bit of a step up, the only reason I am having that opportunity is because [my supervisor] has helped to create that opportunity. (Early-career female interview participant)

These depictions of evaluator influence on advancement outcomes suggest that despite being allocated the responsibility to referee performance against formal criteria outlined in organizational policy, evaluators', particularly APA supervisors', authority was not being curtailed to this role alone. It is important to understand the factors behind this extension of influence: Were supervisors actively overriding formal policy or were systemic inadequacies creating a *de facto* dependency on their private judgements? The following section will explore these issues through an examination of the evaluation criteria for promotion at PRO.

4.1 Evaluation criteria

The APA system offered the potential to enhance clarity in expectations and consistency in performance evaluations through participatory objective setting. However, few research scientists reported clarity about whether achieving the specific performance standards established in their APA would ensure a successful evaluation for promotion. Most research scientists believed that the criteria used to determine promotion worthiness were opaque. This uncertainty created difficulties for individual research scientists seeking to identify whether they would be successful in an evaluation for promotion to the next salary level.

Certainly the assessment of whether you're on track is not transparent. In the same way that with promotions, you're not clear what you have to be doing to get promoted… I think it's probably, you know, to get promoted you basically have to have the glowing APA report for two years in a row. But that in itself is not sufficient. And this has been… I think this is one of the bugs is that you should really know when you say what you're going to do for a year, that if you do that, that is good enough to get you to the next level, or it's not. (Mid-career male interview participant)

The lack of translation between performance objectives and promotion eligibility was a key criticism of the system's operations, given formal policy's specification that sustained performance at a higher salary level should warrant promotion. The quote below from a survey respondent expresses uncertainty about how her objectives translate to level-specific standards of performance. This suggests that the publicized level-specific sample objectives provided insufficient guidance on the activities and outputs that would generate a successful evaluation for promotion.

> *PRO should define for each level general standards for performance rather than each individual coming up with their own as it is impossible to prove that you have outperformed as individuals may indicate higher than normal performance indicators. It seems that promotion is based on time in seat/political strategy rather than performance of the individual per se. (Early-career female survey respondent)*

The inability of level-specific objectives and role descriptions to frame evaluations of performance for promotion illustrates why the dependence on supervisory support was so strong. The quote below provides further evidence that supervisors are often the sole 'expert' on subordinates' research field and performance. It also suggests that effective translation of organizational expectations of level-specific performance is another key mechanism through which supervisors' sponsoring role could be enacted.

> *The classification standards for each level are vague in their description. Because [PRO] is such a broad organisation they've got to be quite generic so to try and break those down to make them specific for a person to go up a level is… it depends on the supervisor basically (Mid-career male interview participant).*

The lack of universalism in sample objectives created incentives for individual research scientists to establish easily achieved performance goals in their APA, or to commit to very general performance objectives to be eligible to apply for promotion. The following quote illustrates how research scientists might opt for more general performance objectives in recognition that priorities might change over the performance cycle and that they might not be able to maintain control over certain outputs, such as achieving a publication in a particular journal.

> *I would do my performance review with the APA ticked and say that I intend to publish in some appropriate venues. I would set myself a much more distinct goal; I want to publish this work in this journal or this week of this conference. There's a few points like that where I would be deliberately vague in the APA so… there's not a full foul at the end of the year. And also because things change. I don't want to commit to too many particulars in the written performance stuff because it might turn out that my brilliant idea is actually rubbish or vice versa. (Early-career male interview participant)*

There was a proviso in the APA for changes in employee circumstance that effected performance. The above quote illustrates, however, that this research scientist did not trust the performance evaluation process to effectively recognize changed circumstance. It may also be indicative of an organizational adversity to risk-taking by research scientists. Indeed, survey data confirm a broader organizational adversity to risk-taking by research scientists, with only 21% of respondents agreeing that PRO supports employees who take calculated risks. Lack of trust in organizational support for informed risk-taking discourages ambitious objective setting (Byrne et al. 2012).

These findings illustrate that the standards of performance for promotion were not publicly established despite the publication of formal policy regarding their composition. As the guidance provided in organizational policy was insufficient for research scientists to gain complete and equal knowledge of promotion criteria, they were dependent on their supervisor for guidance and clarification. This suggests that the scale of evaluators' influence identified in the previous section was a result of insufficient administrative controls more than supervisors actively overstepping their designated authority. Given the apparent centrality of supervisors to research scientists' knowledge of promotion criteria and success in promotion application, it is important to understand the factors influencing the provision of supervisory support. Is favour granted to select individuals or do organizational factors influence supervisors' relationships with subordinates? The following section will examine the relationship between supervisors and subordinates to identify factors that may contribute to variation in supervisory support.

4.2 The supervisory relationship

Two inter-related factors were affecting the supervisory relationship at PRO: reporting lines and supervisory workload. The size of the organization and the diversity of its research complicated reporting lines and could generate supervisor—subordinate relationships between individuals with limited interaction, resulting in limited familiarity of supervisors with their subordinates' performance. The quote below from a supervisor illustrates how trust can become the sole basis of performance evaluations.

> *[It is] very difficult in one regard, because at least if you work on one project together, you are at least in a position that you assess your staff members' attributes, strengths and weaknesses and you can have a better sort of feel from first-hand experience rather than relying on them. (Senior female focus group participant)*

This challenge was not an isolated problem. Amongst survey respondents, 24% reported having little contact with their APA supervisor. A lack of interaction could inhibit supervisors' capacity to effectively support the translation of level-specific performance expectation to individual subordinates' specialization and to evaluate subordinates' performance for promotion. Only 45% of survey respondents reported that they received performance feedback outside of the APA, further evidencing limits in regular working relationships within reporting lines.

Many supervisory workloads were also too large for effective engagement with subordinates about their performance goals and promotion aspirations. Survey respondents with supervisory responsibilities worked a median of 48 h per week and reported high levels of work overload and emotional exhaustion. The quote below from a mid-career research scientist illustrates how supervisors' workload limited their ability to provide equitable support to all of their subordinates.

> *So each program leader, instead of managing 30 or 50, is managing 60 or 100, which is too many people to manage the careers*

independently… Don't know them. Don't care. They will know a lot about a small number of people, the people they've been with for the last ten years, and you can bet your bottom dollar that the people in there they don't like are screwed forever, the people they do like in there, that they do know well are sweet forever, not because these people are malicious and you know, conniving, it's just simply because you operate on what you know, and if you don't know about other people they're simply rows in a spreadsheet. (Mid-career male interview participant)

Work overload is a substantial problem in research science. It affects research scientists' individual health and well-being as well as their capacity to perform their duties effectively (McInnes 1999). Work overload causes many research scientists to neglect administrative duties, including performance evaluation (Anderson 2008). Although examples were presented of highly involved supervisors, engagement could represent a substantial burden.

My supervisor now is doing [performance guidance]. She's doing it all the time. She's very interactive with staff. I don't know when she gets her work done. It's like those managers who spend all day talking; when do they sit down at their computer and write something, you know? I think it's at 2: 00 am she has to do that. So, I think that is not good. (Early-career female interview participant)

The establishment of a supervisory relationship across scientific specializations presented a particular challenge to performance evaluation. Research specializations remain central to professional evaluation in research science; specializations define professional networks, publishing, research methods, and trends (Becher and Trowler 2001). Not sharing a scientific specialization could significantly inhibit the effectiveness of a supervisory relationship.

I have only done one APA and again it is a little difficult because I am kind of in a different research language to the other people; so I am not at the bench. I am not sure that the person doing my APA, I think they would be the first to agree, is really qualified in terms of my scientific output and what I'm achieving because my [research peers] are in other [departments]. (Mid-career female interview participant)

This was a particular challenge for research scientists who worked in isolation and did not share a scientific specialization with any others within the organization. Such individuals reported little opportunity to gain guidance or advice about promotion objectives in addition to a significant lack of knowledge about relevant performance standards.

No one knows what I do or passes judgement on it, except when I write a case for promotion then people will have a look at that… And God knows what they're actually using to assess me… I have no idea how they do that. (Mid-career male interview participant)

Matching supervisors and subordinates in diverse research environments is a substantial organizational challenge. Beyond the constraints of time and capacity, supervisors' supportiveness was shaped by their management style and the priority they placed on their supervisory responsibilities. One senior female interview participant claimed that 'it's just the nature of the people that you work with and their willingness to keep an eye out for you'. There was evidence of variability in supervisors' commitment to their duties in relation to performance evaluation, as evidenced in the quote below.

For the last two years my supervisor did not make the time to have any APA feedback meetings with me. A number of meetings which I tried to arrange fell through and a meeting which he tried to arrange after he'd approved my leave fell through. And so I went a whole year… in which my supervisor showed no interest whatsoever in what I was doing and… didn't make the time… to give that feedback. (Mid-career female interview participant)

Neglect of supervisory responsibility is common in research science due to the lack of reward for performing administrative tasks and significant workload burdens. Such neglect can also be an example of resistance to bureaucratic controls from senior research scientists who resent the additional administrative workloads and the interference on their autonomy (Trowler 1998; Prichard 2000; Barry, Chandler and Clark 2001). When not linked to reward, systems of performance evaluation in PROs are often viewed as surveillance measures and are met with hostility from both appraisees and the supervisors tasked with enacting them. Many scientific managers fail to complete expected performance evaluations or superficially tick the form to appease executive authorities (Benmore 2002; Anderson 2008). These findings suggest such neglect may also be present at PRO.

Despite structural barriers to engagement, the majority of research scientists reported that their APA supervisor took their performance evaluation responsibilities seriously. Less than 10% of survey respondents reported that their APA supervisor provided feedback in a thoughtless manner, but only 61% stated that their supervisor was usually available to provide feedback. This suggests that lack of time was a more significant barrier than motivation in supervisor engagement. If research scientists are not rewarded for supervision, not supported with conducive workloads, and not held accountable for taking performance management seriously, then a consistently engaging approach to supervision is unlikely to become engrained within an organization.

5. Conclusion

This article proposed a typology of four archetypal systems of evaluation that represent the range of roles played by evaluators. The study found that the PRO promotion system was designed as a refereed contest but was operating as a sponsored contest in which evaluators, particularly APA supervisors, could serve as enablers of subordinates' promotion. The findings illustrate that evaluators could be *de facto* enablers of subordinates' career advancement without actively seeking to over-ride or circumvent organizational policy. The study highlights the challenges of enacting a well-supported contest for mobility in a large, research-diverse PRO, and how the role played by evaluators is determined by both the design of the evaluation system and contextual factors such as workload and reporting lines. In PRO, the privacy under which evaluation criteria were interpreted and evaluations were conducted shaped the scale of influence evaluators had over promotion outcomes. A lack of specificity and applicability in the criteria for promotion that research scientists could glean from organizational policy illustrated why the promotion system at PRO was not curtailing the role of evaluators to one of

referees only. This is problematic as when evaluators are granted the authority to enable individual subordinate's success, equality of opportunity is curtailed and the applicant pool is limited.

The finding of *de facto* rather than selective enabling of subordinates' promotion prospects contradicts the prevailing perception of sponsorship in the literature on research scientists as one of active selection (Hargens and Hagstrom 1967; Zuckerman 1977; Reskin 1979; Cameron and Blackburn 1981; Becher and Trowler 2001; Miller et al. 2005). There was testimony of explicit prejudice, particularly amongst mid-career and senior women. Inadequacies in supervisory support in objective setting and evaluation, however, were more often a result of heavy workloads and disconnected or mismatched reporting lines. These obstacles inhibited the effectiveness even of motivated supervisors. Supervisors could only effectively advise and evaluate those subordinates with whose research and work activities they were familiar. This perceived partiality could in fact be enacted without active prejudice against those with whom they were not familiar. This inequality risks leading to enhanced promotion opportunities for those who were known by their supervisor and more limited opportunities for those who were not, or those in a different disciplinary field, regardless of research performance.

Although time and workload were the most influential factors shaping supervisor engagement, there was little indication of strong accountability measures around supervisory performance. As a result, there appeared limited consequences should supervisors neglect their duties. This is representative of a wider problem in research science, which often fails to reward non-research activities, particularly administration, and can lead to neglect of duties (Benmore 2002; Anderson 2008). Research participants supported clearer rules and procedures to make the evaluation criteria for promotion clearer and the application of performance and promotion guidelines more consistent. The benefits of which have been identified in non-research settings, as bureaucratic controls can serve not as constrictive red tape but equity protecting 'green tape' that formalize otherwise unwritten rules (DeHart-Davis 2009). The demand for increased formalization, however, conflicts with workload and capacity of many research supervisors, which is a major barrier to its enactment.

The generalizability of these findings beyond PRO is limited due to the consideration of a single organizational promotion system. Organizational context and promotion system design will vary across research organizations and require independent investigation to understand their specific dynamics. Compared with university faculty upon which existing research is based, PRO scientists are structurally more dependent on their supervisor due to the more hierarchical nature of the organization and the absence of standardized research metrics for non-peer-reviewed research output. The findings do, however, provide an insight into the challenge faced by large PROs in seeking to achieve uniform, standardized evaluation criteria for internal reward. The complexity of achieving research familiarity in supervisory relationships will continue to increase as research groups and centres crossing disciplinary lines continue to grow (Feller 2002). This dynamic will require increased attention by research organizations into the future to mitigate the risk of ill-informed research scientist evaluation. The findings therefore have implications for large PROs grappling with the challenges of establishing consistent and effective methods for evaluating research scientists' performance for internal promotion. All the organizational factors identified in this study as contributing to the default system of sponsorship are being experienced across the sector. The prohibitive effect of heavy workload burdens amongst research scientist supervisors in particular is a problem experienced across the spectrum of PROs as funder demands for productivity and responsiveness generate uncertainty and work intensification (Benmore 2002; Ogbonna and Harris 2004). The typology proposed in this article may hence be applicable in other research organizations as a means of examining the nature of evaluator influence and its link with organizational policy and context. Further research on organizational dynamics and the role of evaluators in evaluation is needed to support the development of remedies to mitigate the risks of sponsorship in the face of organizational complexity.

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