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Individual excellence funding: effects on research autonomy and the creation of protected spaces

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This article contributes to the emerging body of literature which investigates the mechanisms through which funding conditions affect research. It is an interview-based case study of the Distinguished Professor Grant (DPG); an excellence funding instrument aimed at individuals. The study uses the concept of “protected space” to explore the epistemic and organizational dynamics enabled by the DPG. By virtue of their larger size and longer timeframe, excellence funding schemes are assumed to promote greater research autonomy and risk-taking, providing a “protected space”. Semi-structured interviews with DPG recipients revealed that the autonomy afforded by the funding instrument extends to three areas: epistemic, strategic, and temporal. However, this autonomy is modulated by the characteristics of the researchers and the environment in which they operate. The article concludes that, rather than involving a one-time accomplishment, enacting “a protected space” using a grant like the DPG requires constantly balancing investments and adjustments in different priority areas.

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Introduction

Over the last three decades, the funding landscape of academic research has changed significantly. Not only have the levels of funding not kept up with the expansion of the science system leading to a state of relative resource scarcity (Ziman, 1994), but the nature and composition of the funding itself changed. There has been a general shift towards performance-based funding (Raudla et al., 2015; Hicks, 2012), and in particular, the share of competitive project funding has increased relative to institutional funding (Geuna, 2001; Lepori et al., 2007; Steen, 2012). A third and growing trend is that of more direct priority setting such as thematic calls and collaborative requirements (Lepori et al., 2007; Steen, 2012; Gläser and Laudel, 2016).

Given the central role of funding in enabling and constraining research, it is no surprise that the above-mentioned developments are receiving considerable scholarly attention. While there is clearly a common focus on the impact of funding in the resultant body of research, there are important differences in emphasis. The dominant line of enquiry is studies that examine the effects of funding on research performance and research content (e.g., Auranen and Nieminen, 2010; Jacob and Lefgren, 2011, Aagaard et al., 2015). Most of this research either focuses on the effects of the increasing allocation of resources on a competitive basis on the macro-level, or on micro-level changes in researcher behaviour against a general background of changing funding and organizational conditions. Relatively few studies attempt to link researcher behaviour to particular governance or funding factors (see, for example, Laudel, 2006; Heinze, 2008; Laudel and Gläser, 2014; Franssen et al., 2018). Such studies investigate the impact of particular funding instruments and arrangements and seek to understand the mechanisms through which they affect researchers.

This paper builds on the findings of this emerging body of research and seeks to make a contribution by exploring the epistemic and organizational dynamics produced by an excellence funding instrument, the Swedish Distinguished Professor Grant (DPG). Excellence funding refers to highly competitive funding schemes that promote the concentration of resources (funding and people) and building capacity. The organizational form of excellence funding can differ from a distributed virtual entity to a physical centre. Excellence funding instruments may also be aimed at disciplinary, or interdisciplinary constellations (OECD, 2014). Regardless of the epistemic or organizational focus, excellence funding is always aimed at granting high-performing researchers a large share of research resources over a longer period than standard project funding. While the majority of excellence instruments are intended to create centres, a few excellence funding instruments target individuals. Some of the more well-known of these include the European Research Council's (ERC) Advanced and Starting Grants, the South African Research Chair Initiative, the Canadian Research Chair, and the Dutch Vici grant.

The Swedish Distinguished Professor Grant (DPG), which is the subject of this study, is one of the most generous of these individual excellence schemes—in terms of duration (10 years), and autonomy (quasi-absence of organizational and content requirements and predefined commitments). This paper uses the DPG case to explore the role of autonomy in promoting research excellence. The question this study poses is: how do researchers leverage the autonomy granted by “no-strings-attached” excellence funding?

Excellence funding

Since the mid-2000s, research excellence initiatives i.e., policies aiming to promote high research quality and competitiveness have

become increasingly popular across many countries (OECD, 2014). These initiatives took many forms including the reallocation of performance-based institutional funding on the basis of excellence outcomes e.g., the UK's Research Assessment Framework, and the allocation of large grants—financed through the injection of extra funds or redirection of existing research funds—on a competitive basis e.g., Germany and Denmark respectively (Cremonini et al., 2018). Excellence funding instruments refer to the latter type of excellence initiatives. These funding instruments may vary in volume, duration, type of recipients, degree of collaboration, interdisciplinarity, and the consideration of new vs. established lines of research. They may vary in their definition of excellence (e.g., whether the focus is on breakthrough research or on high-quality research in general). What they have in common is their more generous terms in volume and duration compared to the common project grant. The underlying assumption is that the concentration of resources in the hands of the best researchers and a long-term focus will produce more ground-breaking research and will lead to a more productive, attractive, and competitive science system overall (OECD, 2014; Bloch and Sørensen, 2015).

A longstanding concern about project funding has been how it inadvertently privileges mainstream, low-risk, and applied research (Laudel and Gläser, 2014; OECD, 2014). When applying for standard project grants, researchers develop their research proposals not only in response to the priorities set by policymakers and funders but also based on their perception that peer review is conservative and biased against risky, unorthodox, and interdisciplinary research (Laudel, 2006; Leišytė et al., 2010). A perception that is not unsubstantiated if one is to go by the numerous studies that confirm this finding (e.g., Chubin and Hackett, 1990; Langfeldt, 2001; Van Arensbergen et al., 2014). In addition, the short duration of project funding (typically no more than 3 years) does not allow researchers to take risks, experiment, and address research problems of a wider and deeper nature (Laudel, 2006; Heinze, 2008). Excellence funding schemes may be seen as a policy effort to attenuate the negative effects associated with the increasing reliance on standard grant allocation mechanisms. The assumption is that armed with a critical mass of personnel, time and the necessary budgetary resources, researchers will engage in pathbreaking projects that require more risk-taking.

The few studies that investigate how such funding affects research practices at the individual and group levels point in that direction. Hellström et al. (2018) found that the Linnaeus Centre of Excellence grant allowed researchers to make long-term investments in organizational capacity, engage in unconventional collaborative arrangements, and address new and risky research problems. Similarly, Laudel and Gläser (2014) reported that ERC grantees were able to embark on projects that would have never seen the light of day without such funding as they involve higher levels of uncertainty, require the development of new methodology, etc. These studies highlight the role of funding stability and flexibility in enabling risky and time-consuming research.

It is the premise of this paper that, since the DPG has more generous conditions than these excellence funding instruments, it confers a higher level of resource stability and flexibility, and, by extension, greater research autonomy. The concept of “protected space” (reviewed below) is used to explore the nature, extent, and affordances of such autonomy.

“Protected space”: an analytical framework for research autonomy?

Science came out of WWII in a rather privileged position and science policy as a separate policy area began to emerge. Scientists

were granted significant professional autonomy: scientific and academic institutions were given large endowments and the freedom to organize themselves, determine which subjects were of interest, and decide on the distribution of resources. This, however, was done with the general understanding that science would deliver knowledge that would contribute to societal welfare and economic growth. The science-society contract was the metaphor coined to describe this arrangement between science and policy. This discourse helped scientists to create “protected spaces” that allow them to research what they want and how they see fit without external interference (Rip, 2011). Not all research during that period of time was conducted under such conditions but the discourse went a long way in shaping expectations of science, its legitimacy and its interactions with the rest of society (or lack thereof).

This view of science has come under fire since the 1980s, under the joint influence of shifting politics, changing institutional realities, and new academic perspectives (Martin, 2003; Elzinga, 2012). Today, science policy aims to contribute more directly to innovation and economic growth. Academic research has become an object that must be evaluated, compared, and steered—in short strategically governed. Researchers must be held accountable and their performance evaluated using indicators; funding instruments guide scientific agendas, and processes of knowledge production are opening up to new interactions. As a result, the autonomy of researchers and scientific institutions has been reduced and protected spaces have been opening up (Rip, 2011). Such developments are particularly alarming for those who see science’s role and legitimacy on the basis of the post-war science discourse.

Rip (2011) argues that the post-war decades were a special time in the history of science and should not be the benchmark against which the current configurations and future developments of science are measured or decided. The institutionalized narrative that views science as a purely scientific matter has no warrant on historical or epistemic grounds. Historically, protected spaces have been drawn and redrawn on the basis of different inclusion and exclusion criteria. Epistemically, the social and organizational settings in which research activities take place have a significant impact even within the confines of the spaces that are so-called protected from external influences. Political, social, and organizational dimensions should not be seen external to scientific practice, merely contextual—which is how many social studies of science approach the subject - but rather as elements which are an integral part of epistemic practices. “Protected spaces have material, socio-cultural, and institutional aspects” (Rip, 2011, p. 202). Essentially, one is speaking of “nested protected spaces”: at the micro-level of individual researchers or research groups, at the meso-level of scientific communities and institutions, and at the macro-level of the evolving social contract between science and society (Rip, 2011). Whether or not one agrees with Rip about the ‘neutrality’ of the changes in scientists’ protected spaces, a number of unanswered questions remain about the nature of these changes, the extent of the autonomy they grant, and how they relate to research practices.

While there are several studies on the effects of changing research conditions (funding conditions specifically) on academic research content, researchers’ choices and strategies, (e.g., Laudel, 2006; Leišytė et al., 2010), the literature on “protected spaces” per se is very limited. In addition to Rip’s use of the concept to map changes in knowledge production dynamics over time, a literature search turned up only a handful of (connected) articles making use of the concept in an analytical capacity (Laudel, 2017; Gläser et al., 2016, 2014; Laudel et al., 2014a, 2014b; Whitley, 2014). “Protected space” in this literature is a heuristic concept that is operationalized in different ways to explore the degree of

autonomy and agency academic researchers have to conduct the research of their choice in the manner they prefer. In line with Rip’s view of science as multidimensional, these studies attempt to capture a comprehensive view of the factors (epistemic and organizational) influencing knowledge researchers’ decisions and processes and how they interact with each other.

Laudel and colleagues (2014a, p. 240) define “protected space as the autonomous planning horizon for which a researcher can apply his or her capabilities to a self-assigned task.” Two dimensions are core features and thus predictably present in all studies: “the time horizon for which the capabilities are at the sole discretion of the researcher (i.e., for which he or she is protected from direct external intervention into his or her epistemic decisions and external decisions on the number of capabilities) and the resources (including personnel over which the researcher has authority and the actual time available for research)” (Gläser et al., 2016, p. 28). Additional dimensions can be added depending on the focus of the investigation. In her empirical study of the role of protected space in starting new lines of research, Laudel (2017) adds the dimension of “range of topics”. Interested in the effects of changing institutions on innovations via their effects on protected spaces, Whitley (2014) considers the degree and distribution of protected space. In sum, protected space is used as a dependent or independent variable or both, and serves as a good framework for systematically comparing different science systems, career systems, and research fields across various institutional and epistemic aspects.

Although their organizational positions bestow a degree of formal autonomy, university researchers often have to actively construct protected space because formal autonomy is often practically difficult to operationalize when one is operating in a context where several other tasks compete with research for time. Building, maintaining, or extending a protected space is all about gaining resources and/ or optimizing their use in research. Academic researchers adopt a number of strategies to gain control of time and resources including searching for positions that offer the required amount of protected space (including start-up grants for professorships), negotiating access to resources and release from non-related research duties within their organizations, project funding, and ‘bootlegging’ money from other projects (see Laudel, 2017; Gläser et al., 2014, 2016). While one’s academic position does not automatically translate to actual protected space, it does affect one’s ability to build it in a number of ways such as eligibility to apply for grants (Laudel, 2017).

According to Rip (2011, p. 202), “the effect of protected spaces is the reduction of interference and of variety”. Protected spaces limit ‘undisciplined’ and potentially innovative approaches. Paradoxically, they are also spaces that allow science to develop little by little. Protected spaces basically generate an inherent tension between the need to support diversity to ensure the production of innovative knowledge on the one hand, and that of maintaining a certain closure, synonymous with discipline and allowing particular approaches to reveal their productive potential on the other hand. As a result, building new or changing existing protected spaces need not always happen in response to factors external to science resulting in material shifts. Intra-scientific factors, namely epistemic developments and the evolution of academic disciplines, can lead to new dynamics of inclusion and exclusion and push to create new boundaries and spaces.

Laudel and colleagues (2014a) study on the rise of evolutionary developmental biology (evo-devo) highlights how emerging fields creating new protected spaces is not a given. The authors consider evo-devo a scientific innovation that does not follow the typical emerging field path; it is developing on top of existing fields rather than alongside them and allowing the mobility of

researchers from old to emergent fields to be partial and reversible. Laudel et al. (2014a) argue these differences can be explained by the facts that emerging fields in the 60s and 70s were supported by easier access to resources and tenured positions, more recent ones such as nano-technology had practical orientations and were sustained by government strategic investments while evo-devo researchers have to base their research strategies and move to the field based on the costs and risk their existing protected spaces can afford them. Since this is a case of field transition, the degree of necessary protected space varies not only on the basis of available research conditions but also the disciplinary background of the researcher given the time they would need to acquire new knowledge and skills. The authors find that, overall, small protected spaces allow for research that is non-experimental: theoretical research, bioinformatics research and conceptual extensions i.e., adding the evo-devo conceptual perspective to the interpretation of traditional results. Medium-protected spaces allow for experimental research with only one species while acquiring empirical evidence pertaining to others through collaborations, from the literature, or from databases of gene sequences. Large protected spaces allow for experimental research with dissimilar species. In essence, the larger the protected space the more researchers could focus on problems that require time and investment in the development of new skills and techniques.

Methods

Case background. The empirical focus of this study is the Distinguished Professor Grant (DPG), a funding programme initiated by Swedish Research Council (VR) in 2013. The objective of the DPG is to create favourable conditions for scientific breakthroughs and the pursuit of long-term innovative and risky research (VR, 2017). Each grantee is awarded the flat amount of 500,000 euros per year for 10 years, amounting to a total of 5 million euros over the 10-year period of the grant. Since 2013, a round of calls has taken place every other year, granting funding to up to 10 researchers. While the calls cover all disciplines/subject areas (i.e., Natural and Engineering Science, Medicine and Health, Social Sciences and Humanities), only 20% of the programme funding is dedicated to the Social Sciences and Humanities. No call has been released for the Social Sciences and Humanities since 2019.

To apply, researchers need to meet the basic eligibility requirement of a Ph.D. obtained at least 12 years prior to application, demonstrate strong research performance and leadership experience and submit a five-page project proposal. Researchers are asked to focus in particular on two aspects: the field impact of the proposal idea and the way in which the funding will be used to establish and develop a research environment. The research environment element was added in 2015, i.e., in the second iteration of the call. However, no expectations were laid out regarding the characteristics of the environment and how it should be organized. Similarly, there were no expectations for detailed budgeting or regular reporting—the only monitoring activity stipulated was the submission of a mid-term report describing the progress of the research environment and the contribution of the host institution to the project.

The DPG includes all the core characteristics of a typical excellence funding instrument: the provision of substantial funding over a longer period of time to high-performing researchers. What makes the DPG unique is the specific combination of its modalities—how these core design features are implemented and supported. For an individual excellence grant, the duration of 10 years is not common. When one adds

the absence of epistemic and organizational requirements and standard budgeting and reporting activities typical of competitive project funding and even other excellence funding instruments, one finds this instrument provides a unique setting and a good contrasting case to study and increase our understanding of the role of such factors and current funding configurations in knowledge production activities.

Data collection. This study was informed by three sources of data. First, text calls and applications were examined to get an overview of the funding programme and determine interesting areas of enquiries. Second, a scouting interview with a programme officer from VR was conducted to provide background information and pertinent details about the funding instrument. Third, semi-structured interviews were conducted with grantees.

All 29 recipients of the grant from the first three call rounds (2013, 2015, 2017) were contacted via e-mail. Those who were awarded the grant in 2019 were not included as they would have received the funding in 2020 and would not have had time to make progress and observe any effects. Out of the 29 contacted grantees, 12 did not respond to the interview requests and 17 agreed to participate in the study. Given the small population (29 grantees) and the diversity of the 17 respondents, the resulting sample provides appropriate coverage and variation for the purposes of this study. Notably, the 17 respondents varied in terms of the disciplines/subject areas and year of the award. The resulting sample includes at least four representatives of all subject areas and years of the award, ensuring that the variation in experience alongside disciplinary lines and maturity of the project can be captured.

The interviews were conducted face-to-face or via Zoom in the spring and fall of 2019. They lasted for 45 min to 1 h and focused on the effects of the funding instrument on research practices and organization. Through the informal semi-structured format that allowed for follow-up questions, researchers were prompted to explore the continuity or changes in their choice of problems, objects, methods, collaborators, etc., and the role of the DPG in facilitating these. The interviews were recorded and transcribed verbatim. Respondents were given the opportunity to view the transcript in order to make corrections or flag sensitive information.

The qualitative methodological approach of this paper is typical of studies of this kind: the aim is not only to capture the effects of different funding instruments or arrangements but also to understand the mechanisms and processes through which these effects occur (see for example Laudel and Gläser, 2014; Franssen et al., 2018; Hellström et al., 2018). We focus on researcher accounts since it is researchers who enact the potential of funding instruments. It is only through researcher accounts that we can assess and unpack the mediating mechanisms and processes linking funding instrument properties to research outcomes. Qualitative methods provide us with the possibility to do the type of fine-grained questioning and interpretation necessary to address this type of question.

Data analysis. Template analysis (King, 1998) guided the interpretation of the interview material. With the research question in mind (i.e., how do researchers experience and make use of the autonomy granted by “no-strings-attached” excellence funding?), the interview transcripts were scoured for statements about (i) the choices researchers made regarding the use of the DPG grant, (ii) conditions facilitating and factors affecting these choices. Following a general inductive approach (Thomas, 2006), statements within these two a priori themes were grouped into clusters and sub-themes based on meaningful commonalities and differences.

The resulting categories are presented in the next section together with explanations and illustrative quotes from the interviews.

Results

This section is divided into two main dimensions reflective of the a priori themes: (i) framing conditions—including the subthemes of autonomy and duty and (ii) focus areas/choices—including the subthemes of maintenance and care, momentum building, and epistemic venturing.

Framing conditions. There is a variety of considerations that researchers take into account when deciding how to use the DPG. In particular, two contrasting imperatives permeate interviewees' explanations of the direction and set-up of their research: those of *autonomy* and *duty*.

Autonomy. When asked to reflect on their experience with the DPG, interviewees were quick to point out how the long-term and substantial nature of the funding granted them the freedom to pursue their research interests without being constrained by budgets or timetables. They highlighted how such an uncommon opportunity encouraged them to think differently. As one interviewee put it

You think about where do I want my research team to be? If I had—it isn't unlimited resources but if I had an unexpected large sum of funding, how would I take the next jump rather than the next small step? INT#13

This epistemic autonomy was compounded by other features of the funding. For example, the individual nature of the grant means that the research agenda remains under the control of the recipient and does not depend on negotiations with co-applicants as is the case of Centres of Excellence funding.

I wouldn't say that I was the centre, but I'm very happy to say that I'm very much this research—this rådsprofessor grant—because it's really built on my own agenda. INT#1

Similarly, the lack of strict definitions and criteria for excellence or breakthrough research in the call means the researchers did not have to limit themselves to particular ideas of novelty or risk-taking. They could focus on advancing promising research lines they started either recently or for a long period of time. They perceived such continuity to be difficult to support with other excellence funding instruments such as the ERC Advanced Grant.

[The ERC] prefer to fund new things, that you start a new project that has not been funded before. [...] They would not fund you, even if your research had been outstanding, if you just continue the project you're working on INT#7

The DPG's minimal planning and reporting requirements actually allow researchers epistemic autonomy beyond the application period and initial stages of the research. Interviewees felt empowered to change research directions or add new ones in later stages if they saw fit.

I see it more like it's a lump sum given to you as a researcher to do something good with, in the best possible way, and without being tied to a budget that you wrote many years ago. INT#16

Finally, beyond control over their research agenda over a long-time horizon, the DPG allowed researchers more control over their time overall as it cuts down their need to frequently apply for the money.

The biggest impact is that one doesn't have to think about research funding for a while and one can just focus on science. INT#16

Duty. While the autonomy afforded by the DPG is extensive, it does not translate into an absence of responsibilities and expectations. Researchers reported their research choices being shaped by a number of obligations and needs to which they perceived it was their duty to respond.

On top of the list comes their responsibility vis-à-vis their team members and the people they bring into the project, particularly PhD students and early career researchers. Not only do the grantees as group leaders need to think about ensuring the students and postdocs have findings in a timely manner to build their dissertations and publications on but they also need to consider what crossing disciplinary lines means for their career capital and development.

As we develop now, I start to look for other interests and other competences. It's not easy because you cannot completely just switch [employers] ... I mean, they have to think about their career, and I have to think about their career. INT#1

The other major duty the interviewees felt compelled to fulfil is toward science and funders. Several grantees observed that they felt a certain obligation to the funder in return for the generous conditions of the instrument:

It's a great thing to get and one just feels like one also has to show why one deserves to get this. INT#16

This sense of obligation leads to considerations of two often competing logics: those of novelty and feasibility.

If you're trying to do any kind of discovery research, [...] you do take a risk. At the same time, it's not an uncalculated risk. [...] You have to be responsible with what you're doing. INT#13

Focus areas. Guided by these considerations of autonomy and duty, grantees made particular choices regarding resource allocations and core aspects of knowledge production e.g., topic selection, research approach, etc. These choices varied among researchers but they all fall under one of three categories: *maintenance and care*, *momentum building*, and *epistemic venturing*.

Maintenance and care. Grantees made many choices with the care, survival, and prospects of their groups and colleagues in mind. For example, to ensure appropriate care for junior researchers, some researchers did not want to expand the group (too much) in order to be able to keep a finger on the pulse.

I want to be able to supervise my students [...] I have managed to have a weekly set time for every PhD student. [...] I prefer that way of working, and to be relatively small and efficient group. INT#15

Others claimed that they wanted to keep a good ratio of senior to junior team members to allow for quality support.

Now I have a mixture of more experienced scientists and younger scientists [...] it's a big advantage to have scientists that are more experienced and can take part in the training of the younger students. INT#7

Being able to hire senior scientists with the DPG serves more than one purpose. A number of interviewees mentioned being

able to support less established colleagues as an important consideration.

Apart from the obvious objectives of the project itself, in terms of beyond that, my main priority at the moment is some kind of continued work for my colleagues. INT#6

Beyond the support of individual researchers, grantees took advantage of the long-time frame and flexibility of DPG to keep the group agile and build resilience, allowing room for pivoting if need be, either to complete some unfinished business or take advantage of emerging opportunities.

That's one area where I didn't have any other grants and it wasn't covered in this grant either, but it was just such a nice and strong follow-up that I have covered that part from this VR grant. INT#16

Finally, grantees were just relieved to be able to use the DPG to cover the basic needs of the group and running costs that have been difficult to finance with other funding (e.g., equipment, rent). Hunting for funding sources that allow such expenditures creates an unnecessary hassle for group leaders and leads to a waste of time and energy.

We have to rent the lab and that is about 1 million SEK a year. If I have an ERC advanced grant with which I can employ 3 or 4 people, they need somewhere to sit and work. I cannot take the rent from the grant. And that is a huge problem. Nobody has an answer to this. Where should we take the rent from? Whereas with VR, you can take rent. INT#2

Epistemic venturing. A recurring narrative in the interview material is how the sizeable amount of the grant, its long-term horizon, and its flexibility enabled the grantees to take risks. Free from the worry of needing results within certain timeframes in order to publish and secure subsequent funding, researchers report being able to take their time with their DPG project and run various risks. Two main risky behaviours stand out in the interview accounts: increasing complexity and experimenting with different ideas and approaches.

Many interviewees reported that the DPG gave them the opportunity to tackle more complex problems than they usually address. This added complexity was introduced by broadening the scope of the research, scaling up data collection, or moving to more complex empirical objects.

Researching such problems is risky because it is costly, labour intensive, and time-consuming and may lead to a dip in productivity.

The time that was sort of ticking along for these 4–5 years, there wasn't so much more to do other than sample collection INT#5

It is also risky because it often requires researchers to venture beyond their expertise. Such venturing can take the form of crossing disciplinary lines and seeking relevant collaborations that might take a long time to bear fruits if any.

Since I'm not [an expert in this area], I would have had a hard time getting this funding from a regular programme anywhere. I believe that I will be able to actually work in this area and I already started some collaborations [...] discussing these types of things, but it's really a long shot. INT#1

It can also take the form of outsourcing part of the research process and relinquishing oversight of quality.

That means I have to step outside of my own comfort zone because I know what I know, but I have to bring in other people that can help me on what I just described. So you have to have some sense of trust as well and say, okay, I can trust that they're delivering the right stuff. INT#13

Such outsourcing seems to happen in research areas where fast technological developments mean researchers have to rely on method specialists who may still be figuring out how to handle the challenges they were approached for, which can lead to significant delays if not dead ends.

"We handed the samples over to [entity] who are really good expert at [this type of analysis] They had their new methodology [...] I think that the issue was that the data set is bigger, much bigger than what anybody has worked on before [...] so that when they applied the novel methodologies in these large datasets, it wasn't technically as easy as they thought." INT#5

Besides these risks associated with increasing complexity, grantees reported using the DPG to explore new grounds and test the waters to see if certain directions are worth pursuing.

It can fund pilot phases of interesting projects that one can generate, the background research, see whether this actually is a good idea at all and what it can lead to. INT#16

Such exploration can be casual following new leads and developments, or it could be part of a larger more structured effort to chip away at problems where knowledge is lacking or the next step is difficult to figure out.

We did a totally unbiased experiment where we just tested 10,000 [elements] in parallel, and the one and only we find is linked [to the process we are investigating] That was like wow. This is a very high-risk and maybe you can't do that unless you know that you are safe INT#15

Momentum building. In parallel to accounts of risk-taking, narratives related to laying the groundwork for discoveries and pushing the frontiers of science abounded. A common thread in these narratives is how the DPG allowed researchers to mobilize the amount and type of resources they need in a timely manner, and sustain their research efforts without interruptions. One of the main areas that grantees chose to focus on in this regard is building capacity.

Virtually all interviewees saw fit to use the grant to achieve and/or maintain a certain group size in order able to pursue particular research directions.

We're doing research here in the basement but which is still expensive in manpower, you cannot do research with just one Ph.D. student. It doesn't work. You need to have a certain critical mass. INT#9

Not only did the DPG allow grantees to secure enough human capital but it allowed them to improve the quality of their recruitments.

You can recruit the top talent and say, okay, you're the best, I want you here and I can fund you. INT#13

Many grantees chose to take it one step further and hire more experienced scientists on a long-term if not permanent basis. These scientists were meant to lend continuity and professionalism to the research that post-docs and PhDs cannot.

We can have a higher level of some research, research that's not suitable for Ph.D. students, that requires some deeper

background knowledge. The deeper theoretical work has been enabled by this grant in a larger extent than before. INT#10

Finally, grantees reported bringing in specialist expertise that is lacking in the group as warranted by the needs of the research. Hiring such specialists could be for a considerable length of time or on a more punctual basis.

I, for two years, hired what you would call a super postdoc, a person who was really good at [Method]. Because some of the problems we study, we need that competence in the group. INT#15

Besides building capacity, grantees chose to invest in building a knowledge base, that is developing research tools and processes meant to be used to advance their research agenda in particular, but also be of use to science in general. Large-scale data collection was the most common instantiation of such investments.

we have just generated a data set [...] that will teach us a ton about the human genome. That work has come out of the distinguished professors award. This large data set [...] could only be generated with a big grant like this. INT#5

Still, several researchers reported working on method and technology development. Some of them actually emphasized that is the main contribution of their project.

If you want to really address some technically difficult questions, you have to invest in the methodology, and that can take a long time. It can easily take three years. Having this sort of funding allows you to do this right. INT#2

Discussion

As highlighted above, previous studies indicate that control over resources and the stability of these resources over time encourage researchers to take more risks and tackle more ambitious research agendas (Laudel et al., 2014a; Hellström et al., 2018; Laudel and Gläser, 2014). The idea that larger funding volume and longer duration provide the researcher(s) with autonomy, or ‘room to move’ and that in turn enables the freedom to pursue risky, ground-breaking projects, seems to be a tacit assumption behind some of this funding. This is especially true for individually focused grants, such as the ERC Advanced Grant and the DPG. Using the case of an excellence funding instrument with virtually no-conditions-attached, and applying the concept of ‘protected spaces’, this paper investigated this assumption under conditions that could be considered very favourable. In effect, it sheds light on how, under ideal conditions, different dimensions of autonomy can be enabled through such an instrument and the mechanisms through which they can affect research outcomes.

The empirical results underline how the conditions afforded by the DPG are not only a result of the instrument design but also of the characteristics of the researchers and the environment in which they operate. On the one hand, the absence of funding requirements in the DPG led to greater autonomy. On the other hand, it meshed in with community norms and individuals’ research ethos, bringing forth a predominantly self-imposed sense of duty. The greater autonomy extended to three main areas: epistemic, strategic, and temporal. Epistemic autonomy was reflected in the grantees’ freedom to construct their research trajectory and direct their team efforts without having to engage in negotiations with other researchers or actors. Strategic autonomy extended to their ability to easily change course, start new lines of enquiries, or address unexpected challenges as they saw fit. Temporal autonomy involved greater control over time—

the time the grantees could spend on doing research (as opposed to other duties) and the timetable according to which they needed to show results. These freedoms in turn were restrained and enabled by the career and feasibility duties that grantees felt responsible to uphold. As group leaders, they had to help their team members, especially juniors, secure a career path and a future. Involving junior researchers in ground-breaking work could be good for their career prospects, but also create risks that need to be mitigated. Concerns about risk mitigation were also linked to the responsibility grantees felt for having been generously funded: the need to ensure that their efforts were productive and reportable in the long run.

We are now in a position to analyse how the freedoms created by the grant afford a protected space for the grantees. The protected space enabled by the DPG seemed to involve sometimes competing and sometimes mutually enabling conditions of autonomy and duty that required a balancing act on behalf of the grantee. As suggested by the results, this balancing act appears to involve investments and adjustments in the three main areas outlined above: *maintenance and care*, *momentum building*, and *epistemic venturing*. *Maintenance and care* include all activities and choices grantees engaged in to secure a basic platform for their research, the survival of their groups, and the well-being of their dependents. This involved such actions as keeping the group to a manageable size in order to be available for juniors, creating senior availability through junior/senior balance, creating space for unexpected or wished-for development pathways, and creating basic financial security regarding miscellaneous expenses not allowed by other grants. *Momentum building* refers to activities that researchers undertook in preparation for ramping up the research effort, such as building organizational capacity through talent acquisition and development and building epistemic capacity through technology and method development. *Epistemic venturing* refers to redirecting or intensifying research efforts and the different forms this took, ranging from increasing research problem complexity to exploring highly uncertain avenues. Reading the results in this way suggests that, rather than protected spaces being ‘handed on a plate’ as a result of the grant, researchers used the conditions offered by the DPG to engage in a number of activities to maintain and extend their protected spaces. It further suggests that such ‘space enactment’ is not a one-time accomplishment but a continuous, active process amounting to reconciling or balancing the three categories of action mentioned above. Figure 1 attempts to illustrate the relationships underlying this balancing act.

The relationships between *maintenance and care* and *momentum building* on the one hand, and *momentum building* and *epistemic venturing* on the other are relatively clear. Maintaining a group reinforces the grantee’s ability to maintain momentum in terms of accessible resources, which in turn allows epistemic venturing in a number of different directions. Creating a rewarding, safe environment for one’s project members, while

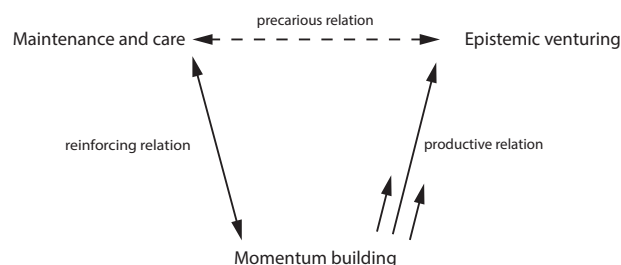


Fig. 1 Protected space enactment. Overview of the grantees’ priority areas and the relationships between them.

creating a forward momentum is an example of a classic balancing act for the project leader. Deciding how to put capacity into possibly competing for new research projects is another. The balancing act here often goes beyond reducing tensions to attempting to create synergies. Indeed, activities falling under *momentum building* serve to support both other categories of action. The hiring of senior researchers stands out as the most pertinent instantiation of this dual support. Taking on senior researchers as full-time members of the team allowed the grantees to tackle more ambitious research problems while giving colleagues a leg up and ensuring junior researchers had proper support. Here, it is important to note that not all *momentum-building* activities are meant to provide dual support or any support for that matter. For example, while building epistemic capacity was expected to enable epistemic venturing, the activity was considered an end on its own, especially considering the risks involved.

The relationship between maintenance/care and epistemic venturing can be described as precarious. The balancing act involved here is mostly about reducing tensions. Essentially, grantees have to work to ensure that the activities falling under these two areas do not affect each other adversely. *Maintenance and care* activities provide security. *Epistemic venturing* activities generate uncertainty. Having the safety net provided by *maintenance and care* activities was necessary for researchers to feel comfortable to engage in *epistemic venturing*. However, the sustainability of the safety net required taking epistemic risks on behalf of the research group. Mitigation of such risks took direct forms, for example constructing portfolios of projects with various levels of risk. This relationship is fundamental for understanding the dynamics of protected spaces, namely that apart from resulting from an ongoing process of construction and repair, it also involves situations where conditions and circumstances for juniors' protected space do not coincide with that of seniors or grantees, who confront less risk at a possible failure.

Further reflections and considerations for future research

The experiences of the DPG recipients from all scientific fields are overwhelmingly positive. Their accounts indicate that the DPG achieves what it sets out to do: to enable research that would be difficult to conduct using standard project funding. The more generous conditions of the individual excellence funding allow for greater autonomy and flexibility that researchers use to engage in riskier, more complex, and more time-consuming research. Given these advantages, should the funding instrument be more widely used? Should other countries follow the Swedish example and introduce such individual excellence schemes? It is not possible to answer such questions on the basis of this qualitative case study alone. The latter exemplifies how an individual excellence funding scheme functions and provides empirical support for the assumptions behind the design and use of such funding. However, the study also highlights how the context where these instruments operate matters. The funding affords researchers more autonomy, but the latter is still bound by various considerations related to their research environment (e.g., the survival of the group and the career prospects of one's dependents). This context dependency makes it difficult to make pronouncements about the instrument's suitability for use in other countries, especially where research systems might differ significantly from the Swedish one.

How about scaling up the DPG in Sweden? The universal population of the DPG recipients is rather small so it is difficult to reason from this case what would be the potential impact of scaling up this particular modality of excellence funding.

Moreover, none of the DPG grantees had completed his/her funding period at the time this paper was written. Since the instrument is still in use, the pool of grantees will increase. This opens up the possibility for further research that will deepen our insight into this funding scheme and its potential impact on the Swedish research system. It may also be useful to do a follow-up study of the same cohorts closer to the end of the funding period to assess if their experiences with the instrument have changed over time. Finally, adverse effects on equity and research diversity also need to be taken into account. Increasing the share of such large funding might come at the expense of smaller individual funding and leads to a concentration of funding at the hands of a few. Considerations of this kind seem to be behind the initial lower share of the DPG budget dedicated to the Social Sciences and Humanities, then the discontinuation of the funding scheme for these subject areas. Social Sciences and Humanities are believed to not require as much investment in critical mass, equipment, and infrastructure and to be ultimately better served by more dispersed rather than concentrated funding.

Data availability

Interview transcripts are not publicly available due to the need to preserve the anonymity of the respondents.

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Competing interests

The author declares no competing interests.

Ethical approval

This study was conducted in accordance with the rules of the Swedish Ethical Review Authority. No ethical approval is required for the type of data and method used in this research.

Informed consent

All participants received an interview request and a description of the study via email. Informed consent was obtained orally from all respondents prior to the interviews. The participants were informed about the aims of the research and how their responses will be used anonymously. They were also informed about their right to withdraw from the study at any point, and given the option to review the transcripts after the interviews to adjust/revise as they saw fit.

Additional information

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