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Gender mainstreaming research funding: a study of effects on STEM research proposals

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Abstract

Policymakers increasingly try to steer researchers to choose topics of societal concern and to conduct research in ways that reflect such concerns. One increasingly common approach is prompting researchers to integrate certain perspectives into the content of their research, but little is known about the effects of this governance modality. We analyze 1,189 science, technology, engineering, and mathematics research proposals submitted to the Swedish Research Council which, starting in 2020, required all applicants to consider including the sex and/or gender perspectives in their research. We identify three overarching strategies upon which researchers rely (content-, performer-, and impact-centered) and analyze the ways in which researchers across disciplines motivate, through text, the inclusion or exclusion of these perspectives. Based on our findings, we discuss the scope of the desired effect(s) of a requirement of this kind.

Key words: research governance; gender mainstreaming; policy instruments; research funding; research proposals.

1. Introduction

Contemporary science policy is steeped in ideas that the research community should conduct societally-relevant research (Kearnes and Wienroth 2011; Schot and Steinmuller 2018; Kaltenbrunner 2020). Accordingly, research funding organizations (RFOs) across the globe are taking various actions to steer researchers to choose topics of societal concern and to conduct research in ways that reflect those concerns (Rodríguez et al. 2013; Ramos-Vielba et al. 2022). Various types of funding instruments are used toward this end, of which the more straightforward ones are targeted (or strategic) funding schemes, which earmark money for a preselected topic (e.g. COVID-19). An additional steering modality used to increase the likelihood that funded research reflects public policy goals involves what we may refer to as 'prompting' researchers to integrate a certain perspective into their research (e.g. gender or sustainability). When RFOs 'prompt' researchers they do not direct them to focus on a specific topic or theme but rather to problematize an otherwise autonomously chosen topic by integrating a pre-given perspective. This approach asks researchers to reconsider research problems, methods, analytical approaches, and the synthesis of results. This type of integration 'prompt' should not be confused or equated with efforts to promote interdisciplinary research (Ramos-Vielba et al. 2022) since a prompt does not include requests that researchers cross disciplinary boundaries or engage in cross-disciplinary collaboration.

Importantly, few RFOs make integration of a certain perspective mandatory, instead requesting that researchers (applicants) include it *when the researcher herself considers it relevant*. One example is the European Commission

which 'invites' Horizon Europe applicants 'to describe how the gender dimension (i.e. sex and/or gender analysis) is taken into account in the project's R&I content' (European Commission 2022: 15). Another example is language from the Irish Research Council whose application form states that: '[a]ll applicants are required to give careful consideration to whether there is a potential sex or gender dimension that may arise in the course of their research'. This type of wording suggests a delegation of the decision to integrate a certain perspective from the funder to the individual researcher. In essence, it represents an interesting and understudied way of handling the trade-off between achieving public policy priorities while also respecting the independence of researchers (Braun 2003).

Despite the increasing reliance on this way of trying to influence the content of research, we have a limited understanding of how it works and what types of effects it produces (see GENDER-NET Plus (2022) for a recent review of RFO initiatives). Existing studies aim to quantify explicit references to policy-defined aims in research proposals (Keuken et al. 2007; Haverfield and Tannenbaum 2021; van Hagen et al. 2021) or use surveys to determine researchers' opinions of such policies (Rosenlund et al. 2017). This focus on quantifiable effects reflects a long tradition of empiricist thinking within and about science policymaking, where governance is thought of as a matter of applying instruments whose impacts can be measured in a straightforward manner. While such studies are helpful, we posit that qualitative studies are also needed if we wish to better understand the effects on researcher behavior of this type of governmental intervention. The detailed insights produced by such qualitative studies not

only add to our understanding of the mechanisms through which science policy translates into behavioral and epistemic change but also allow for the fine tuning of policy measures to improve outcomes.

This study takes a first step in this direction by exploring the effects of a requirement that writers of research proposals consider the relevance of applying a sex and gender perspective to the proposed research. We analyze how applicants respond to this request by conducting a detailed qualitative analysis of 1,189 science, technology, engineering, and mathematics (STEM) research proposals submitted to the Swedish Research Council (SRC) in 2020, the first year in which the Council required this type of consideration. As such, and in the absence of a baseline that describes the status of sex and gender integration in the STEM fields, the data and analysis provided here can be seen as a baseline against which future research proposals can be compared.

The paper is structured as follows: Section 2 gives some background to the type of requirement whose effect(s) we study and discusses it in terms of its characteristics, how it is implemented, and its outlook to produce the intended effect. Section 3 reviews previous research that addresses research proposal writing practices and the rhetorical strategies researchers employ in such writing. Section 4 describes the methodological approach, and Section 5 provides the empirical analysis. In Section 6, we summarize and discuss our findings in terms of how to look at different outcomes from a policy perspective. We finish the paper off with some policy recommendations and suggestions for what future research could focus on.

2. Background

The requirement that researchers consider integrating sex and gender perspectives into research content was pioneered by RFOs in the medicine and health field. As an example, the US National Institutes of Health has required funded researchers to include both men and women in clinical trials since 1993 (White et al. 2021). Another example is the Netherlands Organization for Health Research and Development which, since 1999, requires researchers to address sex in their research proposals. That same year, the European Commission took a first step toward gender mainstreaming its research policy by way of, among other things, promoting sex- and gender-sensitive research (European Commission 1999).[1] The Commission's commitment to gender mainstreaming represents one of the first efforts to stimulate the integration of the sex and gender perspectives across *all* scientific fields. Since then, a suite of research councils (e.g. in Austria, Germany, France, Ireland, Norway, Sweden, and the UK) and other RFOs (e.g. the World Health Organization and the Bill and Melinda Gates Foundation) has implemented requirements that proposal writers consider these perspectives. Typically, these requirements are manifestations of ambitious, polity-wide, gender mainstreaming strategies: a horizontal, or integrated, governance approach that requires all policy sectors to tackle the problem of gender inequality (Council of Europe 1998; Walby 2005; Rayner and Howlett 2009). The implementation of this and other horizontal governance strategies is generally associated with 'soft' policy instruments, such as the dissemination of information intended to educate and persuade bureaucrats and other target groups to behave in a certain way (Borrás and Edquist 2013; Candel 2017).

In our case, the 'soft' approach manifests in the absence of coercion. While funders' use of terms such as 'requirement' implies ostensibly an aspect of coercion exerted by funders on applicants, a closer look at application forms often reveals that the only thing that is required is 'to consider including' a certain perspective. Thus, researchers can decide *not* to apply for a certain grant or can motivate the exclusion of a perspective on the grounds that it is not applicable to their planned research. In short, the coerciveness in this type of 'requirement' is typically limited. As a 'softer' alternative, RFOs rely on information to sway researchers to behave in the policy-preferred way. Generally, such information is supposed to educate researchers about the sex and gender perspectives and how they can be integrated into the content of research. To this end, RFOs describe examples of sex- or gender-integrated research, and they provide how-to guides, checklists, etc. This type of material can usually be found in funding calls, guidelines, and other funding-related resources (e.g. European Commission 2022; see Ramos-Vielba et al. 2022). A second purpose served by the information that RFOs provide is to persuade researchers of the merits of integrating the sex and gender perspectives. The norm-based appeals featuring in this information are a manifestation of one of Gläser's (2019) categories of research governance tools, namely that which aims to make researchers 're-interpret' their situation so that their own objectives align with those of a particular policy (see Schneider and Ingram 1990). As an example, the Horizon Europe Programme Guide appeals to both morals and values central to the ethos of researchers (quality, accountability, etc.) in its attempt to persuade the prospective grant applicants of the merits of integrating a sex or gender perspective into their research:

> An increasing body of studies show that the quality, reproducibility and accountability of research and innovation are affected by not taking into account sex and gender analysis. And in many fields, it is crucial to explore whether research outcomes may affect women and men differently. For instance: Why do we observe differences between women and men in infection levels and mortality rates in the COVID-19 pandemic? Does it make sense to study cardiovascular diseases only on male animals and on men, or osteoporosis only on women? And did you know that pheromones given off by men experimenters, but not women, induce a stress response in laboratory mice sufficient to trigger pain relief? (European Commission 2022: 16–17)

The effort to educate and persuade researchers instead of coercing them inserts a high degree of uncertainty when it comes to the effect(s) that will be produced. Will the relevance of the perspectives be acknowledged or dismissed? And ultimately (although beyond the scope of this article), will considerations render the integration of the perspectives in the ensuing research? Research proposals are, after all, only 'promissory documents'. That is, they are performative in the sense that they make a promise, but there may be a diversion between the research that is promised and that which is eventually carried out (Leišytė 2007).

3. Proposal writing practices: literature review

Whether or not and in what way a target group responds to a particular policy instrument are central topics in the general

- Establishing a research territory
- Indicating a gap in the territory
- Stating the goal of the project
- Specifying the means (i.e. methodology and procedures)
- Reporting previous research
- Stating anticipated results and findings
- Predicting the usefulness and value of the proposed project
- Making a competence claim regarding the researcher or research team
- Making an importance claim concerning the proposed project
- Claiming the relevance of the proposal to the objectives of the funding agency

Figure 1. Connor and Mauranen's (1999) list of rhetorical moves (as listed by Tseng 2011).

policy instrument literature. A recent development in this literature foregrounds the interactive aspect of policy instruments and their effects: instruments and their constitutive qualities interact with their target group(s) in their local context, and its effects result from this interaction (Lascoumes and Le Galès 2007; Hellström and Jacob 2017).

Previous research about research proposal writing practices suggests that grant proposals are the result of 'an individual negotiation between the applicant and the funding institution' (Serrano Velarde 2018: 88). Lepori and colleagues propose that research proposals are textual manifestations of a 'critical discussion', or speech-act, taking place in a certain social and institutional context (Lepori and Rocci 2009; Lepori and Greco 2019). The first turn in this exchange is a call for proposals issued by a particular RFO, and the second is the submission of research proposals in response to the call (the assessment of submitted proposals is the third). In this vein, Lepori and Rocci (2009) propose that the conditions and requirements stipulated in a particular research call for proposals be seen as 'critical questions' to which proposal writers must respond convincingly in order to obtain funding. Consequently, research proposals may be approached analytically as texts with the overarching communicative purpose of persuading research funders of the funding-worthiness and feasibility of the proposed research, given the stipulated conditions and requirements.

Existing empirical research about the strategies employed by proposal writers has focused primarily on the way researchers frame the novelty and feasibility of the proposed research (Serrano Velarde 2018; Barlösius 2019; Philipps and Weißenborn 2019; Barlösius and Blem 2021). General strategies employed by applicants in their written proposals have been categorized by Connor and Mauranen (1999), who summarize a comprehensive list of 'rhetorical moves' (see Swales 1990, 2004) (Fig. 1). In the tradition of rhetorical analysis, a move is a piece of (shorter or longer) text that performs a certain action, typically with the intent to persuade an audience.

The majority of Connor and Mauranen's moves relate to descriptions of the proposed research content itself: situating it vis-à-vis previous research indicating the way in which the proposed research is original, specifying the proposed data and methods to demonstrate feasibility, anticipating possible results to show relevance, etc.

There is a long-standing debate about ways in which statements related to these aspects of the proposed work are influenced by factors external and internal to the research community. Some suggest that research proposals are 'prestructured' in a way that reflects an alleged conservatism of review panels (Travis and Collins 1991; Laudel 2006; Heinze 2008; Boudreau et al. 2016; Franssen et al. 2018), whereas others find no such evidence (Barlösius 2019; Philipps and Weißenborn 2019). Barlösius and Blem (2021) point out that researchers may choose to be conservative for practical reasons in the sense that they resort to research plans that are 'feasible, plausible, and practicable' (Barlösius and Blem 2021: 564). This view is reminiscent of the pragmatism central to Fujimura's (1987) concept of 'do-able problems'. Such problems can be solved with the available skills and expertise in each research context, the interest of the problem to a community of researchers, as well as its fundability in the eyes of sponsors. In other words, although research proposals are essentially 'just text' and involve rhetorical moves to convince funders, the promises made are not free-floating but are constrained by the concrete disciplinary, epistemic, and local resources available to proposal writers (Myers 1990; Lamont 2009; see also Hyland 2005). Closely related here is the literature that focuses on the epistemic properties of different disciplines, such as the role of personal interpretation and the degree to which knowledge is codified (Knorr-Cetina 1999), although empirically-grounded accounts of the relation between such properties and the way researchers respond to policy interventions are scarce (Franssen et al. 2018; Gläser 2019).

Another type of move identified by Connor and Mauranen (1999) points to the merits of the applicant(s) themselves. Tseng (2012: 347) argues that 'while [autobiographical discourse] provides relevant information in the grant proposal context, it also possesses rhetorical significance aiming to intensify the coherence of one's research output and laying the foundation for the new proposal being submitted'. This represents a way to put relatively more emphasis on certain parts of a proposal to increase its overall persuasive power (Lepori and Rocci 2009). Yet another move is attempting to frame the proposal so that it aligns with the goals and objectives of the RFO (Leišytė 2007; Serrano Velarde 2018; see McGinn et al. 2019). This strategy is also brought up by Lepori and Rocci (2009) who describe it as one 'where applicants display their knowledge of the objectives and context of the funding agency, for example by referring to documents and using keywords from the call' (Lepori and Rocci 2009: 183).

In short, the diverse literature cited above suggests that proposal writing is a situated textual practice: applicants attempt rhetorical moves designed to convince decision-makers that they have honored their funding request, yet do so in ways that are constrained by various contextual factors, including the specifics of their research fields, local research practices, and individual research biographies. This means that the responses to any requirement or prompt raised by a funding body are likely to be mediated by a host of factors beyond the sheer 'willingness' of applicants to take them aboard.

4. Materials and methods

This section first describes the relevant context for our analysis (Section 4.1), the data (Section 4.2), and our analytical approach (Section 4.3).

4.1 Study context

This study is based on an analysis of research project proposals submitted to the SRC in 2020. With a total annual budget of close to 800 million Euros, SRC is Sweden's largest public RFO. Approximately two-thirds of the budget funds basic research projects in all scientific disciplines. The SRC receives around 6,000 project proposals annually, of which about 18 per cent are funded. Since it was founded in 2001, SRC has worked to promote gender equality in accordance with its directive,[2] but up until 2018 the focus has been on internal operations, including that of the peer review process. In 2018, the SRC was charged by the Swedish government to promote the inclusion of the sex and gender perspectives in the *content* of the funded research, which itself reflected a polity-wide gender mainstreaming strategy. Subsequently, the SRC in 2019 required that applicants for grants in clinical therapy, medicine and health, and educational research consider including the sex and gender perspectives in their applications. In 2020, an identical requirement was applied to the annual open call for project proposals in the natural and engineering sciences (STEM). This latter requirement is the focus of this study.

The practical implementation of the requirement amounted to (1) a yes/no 'box-tick' response to whether the applicant's proposed research will or will not include a sex and/or gender perspective and (2) text that motivates the decision to include or exclude these perspectives. Applicants received various kinds of information about how to include the sex and gender perspectives in their research. Prospective applicants first learned about the requirement when arriving at the web page that introduced the grant. Upon proceeding, as advised, to the heading 'Research description', they were informed that the requirement referred to the inclusion of the sex and gender perspectives into research content and *not* the sex or gender of researchers themselves. Further information was provided under the links 'Our website' and 'Read more about sex and gender perspectives in research content', both of which sent applicants to a web page entirely dedicated to explicating the requirement. This web page provided background to the requirement and served as a primer on the meaning and implications of sex and gender analyses. For further information, web page visitors were referred to two separate sources: (1) 'What is the gender dimension in research? Case studies in interdisciplinary research' (Korsvik and Rustad 2018), a

Table 1. The number of proposals in the ten largest disciplines and the percentage of proposals indicating that the sex and/or gender perspectives are applicable.

Discipline	Total number of proposals in discipline	Percentage and (number) of proposals indicating that the sex and/or gender perspectives are applicable to the proposed research
Biological Sciences	242	27% ($n = 66$)
Physical Sciences	216	9% ($n = 19$)
Earth and Related Environmental Sciences	118	12% ($n = 14$)
Chemical Sciences	116	16% ($n = 19$)
Mathematics	94	5% ($n = 5$)
Computer and Information Sciences	66	39% ($n = 26$)
Electrical Engineering, Electronic Engineering, and Information Engineering	63	11% ($n = 7$)
Mechanical Engineering	56	9% ($n = 5$)
Medical Engineering	37	68% ($n = 25$)
Materials Engineering	34	15% ($n = 5$)

report published by Kilden genderresearch.no, an independent department within the Research Council of Norway with a mandate to 'promot[e] and disseminat[e] gender research and research with gender perspectives', and (2) a 4-min video published by the Canadian Institutes of Health Research. In reviewing these materials, it appears that the aim of both the report and the film was twofold: to educate prospective applicants about the meaning of the terms sex and gender and to offer practical and inspiring examples of research content that includes one or both perspectives. In addition, the Canadian film spells out what signifies a proposal that takes sex and gender into account versus one that fails to do so (in spite of one or both perspectives being relevant). The film furthermore states that researchers who do not include these perspectives must provide 'compelling justification' for their exclusion but do not go into detail about what such a justification would look like.

4.2 Data

The SRC's 2020 open call in the STEM fields rendered a total of 1,189 research proposals, covering a variety of disciplines, some of which are summarized in Table 1. Applicants themselves categorize their proposals using Statistics Sweden's nomenclature for the classification of scientific disciplines (based on the Fields of Research and Development classification system (OECD 2015)). One proposal can contain several five-digit codes, including a primary code that the researcher uses to indicate the *single most relevant* field. Our analysis focuses on the applicant's text motivation for including or excluding the sex and/or gender perspective in their proposed research ($n = 1,189$ proposals). We refer to applications as a 'yes motivation' when the researcher(s) deems the sex and/or gender perspective to be relevant to their research proposal and content ($n = 229$ or 19 per cent) and as a 'no motivation' when the researcher(s) does not deem these perspectives to be relevant ($n = 960$ or 81 per cent). The accompanying text motivation is required for all 1,189 proposals.

Based on the first three digits of the primary code, Table 1 summarizes, in the second column, the total number of proposals across the ten largest disciplines (i.e. disciplines that submitted the greatest number of proposals). The third column shows the percentage of proposals in each discipline that stated that the sex and/or gender perspectives were applicable to the proposed research.

4.3 Qualitative analysis

Our approach, which was inspired by previous studies of proposal writing practices, aimed to identify, categorize, and analyze the strategies and rhetorical moves employed by the researchers. Given the lack of previous studies of (and theories around) applicants' responses to the type of requirement we study—which is fairly novel in the funding context—our approach had an inductive bent. Rather than testing theories, we were interested in making observations about how researchers are responding at this early stage of implementation. Methodologically, we relied on qualitative content analysis (Krippendorff 2013) to identify commonalities in terms of how proposal writers motivate the inclusion or exclusion of the sex and gender perspectives in their proposed research. The analytical procedure was to first identify and analyze stretches of text that in different ways motivate the inclusion or exclusion. We refer to these text stretches as 'moves' in the sense that they are the snippets that 'do the job' of motivating the applicant's 'yes' or 'no' response (see Swales 1990, 2004). The two quotations below provide an example of a 'yes move' and 'no move', respectively:

> Since the optimal energy metabolism may differ between male and females due to differences in life history traits, we will take sex into account when we investigate how variation in efficiency of different components of mitochondrial function relate to variation in individual fitness across environmental challenges. (Biological Sciences)

> This is fundamental research in astrophysics, and there are no sex or gender perspectives involved. (Physical Sciences)

One motivation could include one or several different moves, which were coded according to Table 2. The coding template was initially developed by one of the authors but was then refined in several iterative steps based on discussions between the two authors. The coding was done using the NVivo software. In a second step, we categorized these moves into three aggregate dimensions, which we call 'overarching strategies'. We are thus proposing that moves mobilize (or 'realize') strategies that can be analyzed on a more abstract level. The strategies amount to (1) a *content-centered strategy*, which focuses on the role of sex and gender in the actual content of the proposed research; (2) a *performer-centered strategy*, which focuses on the actions or characteristics of researchers involved in the proposed research; and (3) an *impact-centered strategy*, which revolves around the bearing, or non-bearing, of research results on some aspect of gender equality.

The following section reports the results of the qualitative content analysis in combination with some descriptive details of the research proposals (e.g. discipline) as they were described in Section 4.2.

Table 2. Coding approach used in the qualitative analysis.

Moves	Overarching strategy
(1) Reviewing or citing previous research	Content-centered
(2) Discussing the centrality or relevance of sex or gender without references to previous research	
(3) Describing sampling strategies	
(4) Describing analytical procedures	
(1) Commenting on the gender balance of the research team	Performer-centered
(2) Stating an ambition to hire female researchers/gender balance the research team/promoting female researchers	
(3) Mentioning the university's employment policy	
(4) Describing the planning of activities or processes that will promote gender awareness	
(5) Referring to a relation between gender and research practices	
(6) Stating an ambition to encourage female researchers to engage in outreach activities/act as role models	
(7) Invoking personal experience of prejudice and bias related to sex and gender	
Describing or speculating about future applications of research results	Impact-centered

5. Findings

Of the 1,189 proposals, we have analyzed around 89 per cent feature moves that mobilize a content-centered strategy. Far fewer proposals contain moves that mobilize the performer (23 per cent) or impact-centered strategies (14 per cent). Figures 2 and Figure 3 show how often the three overarching strategies from Section 4.3 feature in 'yes' and 'no' motivations. Notably, only 155 proposals indicate that the research includes a sex or gender perspective *and* rely on a content-centered strategy as a motivation (Fig. 2). This amounts to 13 per cent of the total number of applications received by SRC in 2020. Content-centered strategies dominate, appearing in 94 per cent of the 'no' motivations and 68 per cent of the 'yes' motivations. A larger percentage of the 'no' motivations feature content-centered strategies compared to the 'yes' motivations, and vice versa; more 'yes' motivations than 'no' motivations feature strategies centering on the impact of the proposed research, or the research performers (Fig. 3). Since one motivation can feature several different strategies: an applicant may combine a performer-centered with an impact-centered strategy, the bars in Fig. 2 and Tables 3 and 4 do not sum to 100 per cent.

The remainder of the analysis of text motivations focuses on the two aspects described in Section 4.3: overarching strategies and detailed moves. We analyze 'yes' (Section 5.1) and 'no' (Section 5.2) motivations separately in part because these two groups show different approaches on how they respond to the sex and gender requirements. Furthermore, a quarter of all applications relied on a combination of strategies, and we analyze these separately in Section 5.3. Subsections 5.1 and 5.2 begin with an analysis of the most used strategy (content-based), followed by performer- and impact-based approaches. Subsection 5.3 problematizes Figs 2 and Figure 3 by focusing on the instances researchers use
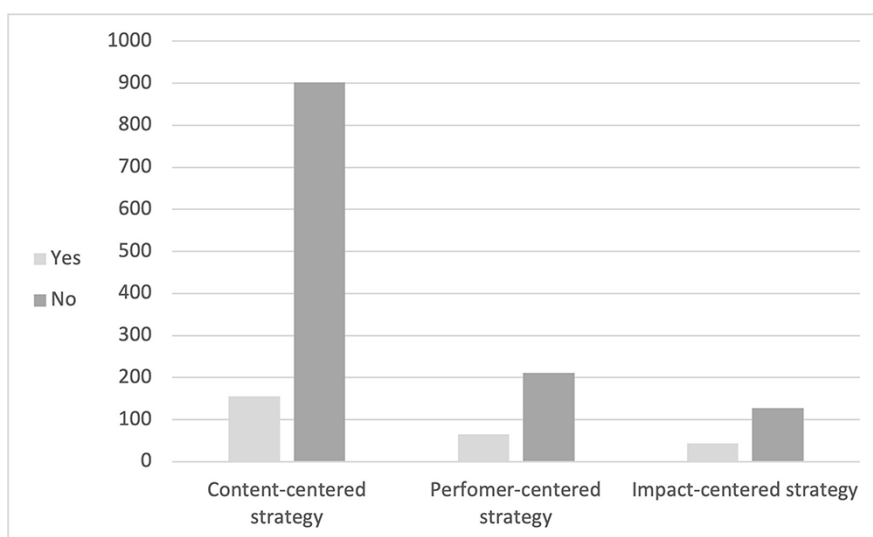
Figure 2. The number of times the three strategies feature across both 'yes' and 'no' proposals ($n = 1{,}504$ proposals). The total numbers do not sum to 1,189 since applicants may combine strategies in their motivation.
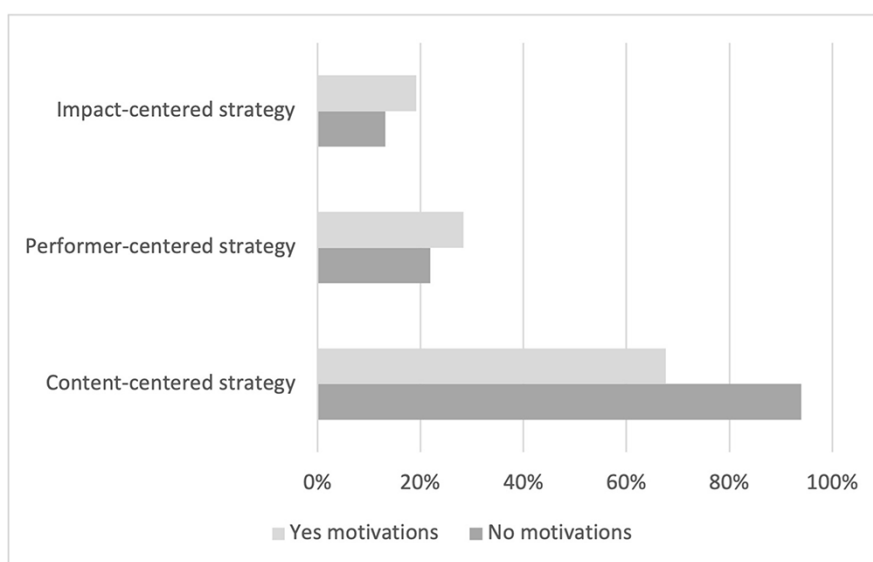

Figure 3. Use of the three overarching strategies across both 'yes' and 'no' motivations ($n = 1{,}189$ proposals). The total numbers do not sum to 100 since applicants may combine strategies in their motivation.

more than one strategy to motivate their inclusion or exclusion of the sex and gender perspectives. This section also addresses the qualitative differences in how authors of 'yes' and 'no' motivation structure these types of strategy combinations.

5.1 'Yes' motivations
Table 3 quantifies how often the overarching strategies occur in the six disciplines with more than ten 'yes' proposals. The table is ordered by percentage from highest to lowest, where a high percentage represents a larger share of the total number of 'yes' proposals. Biological Sciences proposals are by far the most common among the 'yes' proposals, with twice as many proposals as in the next most common discipline (Computer and Information Sciences). Furthermore, Biological Sciences relies heavily on content-centered strategies

(it features in 92 per cent of the sixty-six applications). None of the twenty-five applications within Medical Engineering relied upon a performer-based strategy.

5.1.1 Content-centered strategies
The most common strategy featured in the 'yes' motivations is content-centered (Fig. 3), explicating how or why the sex and/or gender perspectives are relevant, or not relevant, for the proposed research.[3] This type of strategy is used in nearly all the Biological Sciences proposals in the 'yes' category. Other disciplines where this type of strategy is common are Computer and Information Sciences and Medical Engineering. Together, these disciplines account for 68 per cent of the content-centered 'yes' motivations. Among these, the majority refer to the inclusion of the sex perspective (e.g. in Biological Sciences, the sex of plants or animals), and only Computer and

Table 3. Use of the three overarching strategies across disciplines ('yes' motivations), as a percentage basis of that discipline's share of all 229 'yes' motivations.

Discipline	Content	Performer	Impact	% (n) of all 'yes' proposals
Biological Sciences	92%	14%	5%	29% (66)
Computer and Information Sciences	85%	27%	8%	11% (26)
Medical Engineering	88%	0%	20%	11% (25)
Chemical Sciences	37%	47%	26%	8% (19)
Physical Sciences	21%	63%	11%	8% (19)
Earth and Related Environmental Sciences	36%	36%	43%	6% (14)

Table 4. Use of the three overarching strategies across disciplines ('no' motivations), as a percentage basis of that discipline's share of all 960 'no' motivations.

Discipline	Content	Performer	Impact	% (n) of 'no' proposals
Physical Sciences	96%	22%	9%	21% (197)
Biological Sciences	98%	15%	7%	18% (176)
Earth and Related Environmental Sciences	90%	28%	20%	11% (104)
Chemical Sciences	93%	32%	10%	10% (97)
Mathematics	98%	19%	6%	9% (89)
Electrical Engineering, Electronic Engineering, and Information Engineering	89%	18%	27%	6% (56)
Mechanical Engineering	90%	25%	22%	5% (51)
Computer and Information Sciences	100%	23%	10%	4% (40)
Materials Engineering	90%	24%	21%	3% (29)
Chemical Engineering	81%	23%	19%	3% (26)

Information Science proposals commonly refer to the gender perspective.

The specific moves employed to mobilize the content-centered strategy tend to focus on how either or both perspectives will be dealt with in the research—with some moves being rather vague and others more specific. They range from short announcements without references to previous research, like 'we will investigate if judgments about linguistic descriptions involving degree modifiers vary with gender' (Computer and Information Sciences), to longer elaborations containing one or more references. For example:

> Both male and female owners will be included in this study and we will include a balanced number of male and female dogs/cats/horses. This is not only important due to gender aspects but also since sex (in mammalian species, including humans) repeatedly have been shown to have an effect on the hormonal response to human-animal interaction, which in turn could affect the stress levels of both the owner and their animal. In addition, females and males might experience stress differently which is of great importance for the purpose of this study. (Biological Sciences)

Some moves draw on previous findings that are related to the proposed research, thus inferring that a sex- or gender-based analysis is an important aspect of their research proposal. For example,

> Both male and female house crickets will be tested throughout the experiments. This is a new research area and it is therefore important to gain knowledge about both males and females. Based on research in other species it is known that sex differences can be dependent on both behavior test and strain. Furthermore, testing both male and female house crickets is especially important since female animals are underrepresented in research in general. In the literature on behavior in house crickets, the sex is sometimes not reported and by studying both males and females this will further strengthen the knowledge about potential sex differences in the insect research community in general and research on crickets in particular. (Biological Sciences)

Although it is more common for researchers to rely on fairly long elaborations, a considerable share of these is general in character. For example, the application may review previous research that included either the sex or the gender perspective, but without mentioning its actual relevance to the proposed project. The motivations that contain substantial descriptions of how sex and/or gender are relevant to the proposed work typically refer to other parts of the research proposal, suggesting that these perspectives were not 'added' because of the RFO's requirement; rather they may have been central from the outset. A case in point:

> The very essence of this project is to study methods that explicitly take into account the needs of different stakeholders, as well as the dynamics that arise as a result of actions based on different degrees of need fulfillment. In the system models that are developed, different stakeholders will be a natural feature, and thus stakeholders of different genders and their preferences can also be clarified. (Computer and Information Sciences)

Similarly, the fact that applicants often cite their previous work around sex and gender suggests that it is not simply a concession to the sex/gender requirement of the funder, but rather based on more substantive previous engagement by the applicant. This is typical in the applications from the Biological Sciences which, moreover, tend to focus more on sex than gender. For example:

> Research in my laboratory and by other groups have revealed that this female polymorphism is maintained by frequency-dependent sexual conflict, whereby rare female morphs have a fitness advantage as they suffer less from male mating harassment. On top of that, the male-like females ('androchromes' or 'male-mimics') have an additional advantage in that their male-like visual appearance in color and body shape. These male-like females can thereby avoid unwanted male attention, which typically reduces female food intake and fecundity. (Biological Sciences)

Some authors also make outright comments about the centrality of sex and/or gender analysis in their field, highlighting

that the inclusion of these perspectives is 'normal', 'common practice', or something that is 'always done'. For example:

> Only by placing equal effort into understanding the biology of both sexes, and acknowledging differences where they are found without prejudice, can we shed light on the evolutionary consequences of cognitive evolution. This is a perfectly natural way to proceed with unbiased research in my field and it is noncontroversial. I certainly aim to continue with this tradition in the proposed project. (Biological Sciences)

5.1.2 Performer-centered strategies

The second-most common is performer-centered strategies, even though the SRC's instructions explicitly state that such strategies are not relevant for this requirement. Despite this, 28 per cent ($n = 65$) of the 'yes' proposals rely on this strategy when motivating inclusion of a sex and/or gender perspective, and 18 per cent ($n = 42$) use only this type of strategy. 'Yes' proposals in the Physical Sciences rely heavily on this strategy (twelve of nineteen proposals rely solely on a performer-centered strategy) as do the Chemical Sciences (seven of the nineteen proposals). Although not relevant to the Council's requirement, the responses provide insight into how researchers themselves perceive the sex and gender questions.

A common way to mobilize the performer-centered strategy is to promise recruitment of a gender-balanced research team. These applications tend to emphasize an ambition to hire female PhD students or postdocs through affirmative action, encouraging female researchers to apply for positions, making advertisements more attractive to female researchers (e.g. by emphasizing the importance of work–life balance), and working actively to detect gender bias in the handling of job applications. This move is often motivated by reference to an under-representation of women in the field; for example, 'Unfortunately, mathematics is one of the subjects where women are most underrepresented. By hiring PhD students and postdocs in connection with our project, we have an opportunity to be part of changing that—to help more women become successful mathematicians' (Mathematics). Other times, the stated recruitment approach is related to policies already adopted by the applicant's employer. A related theme relates to research collaboration, where several applicants state an ambition to seek female researcher partners.

Some applications propose activities and processes that will ensure sex and gender awareness. The majority of these relate to communication among, and treatment of, project participants. Several applicants underscore the intention to foster an environment where everyone is given equal opportunity. For example, an applicant from the Physical Sciences feels a responsibility to 'creat[e] an inclusive working environment where all members can feel comfortable to develop and carry out excellent science and compete at the international level'.

Some applicants go beyond equal treatment to declare that they will promote female researchers' careers specifically: 'each female team member will get paired with a female mentor outside the home institution and high-profile seminar speakers will be invited. At informal lunch meetings female students and early career scientists can meet with established scientists. This will help the young female scientists to get

insight into different career paths and enable them to establish and grow their own network' (Chemical Sciences). Several applicants point out that while a project grant will indeed help advance the careers of female principal investigators and collaborators, they place more emphasis on the possibility for these individuals to act as role models for other female actors. A popular move in the applications center on how female scientists will engage in outreach activities to reshape the public's idea of who can be a scientist. Others strive to invite female researchers to present their work as discussants at seminars and PhD defenses.

Some moves center on how the gender of the researchers affects the research that will be carried out. One of the most common remarks to this effect is that female researchers are, by virtue of being women, better able to detect gender biases in the research process (e.g. 'The … team … currently consists of one male professor, one male postdoc, and three female PhD students. PhD students are the core researchers of the team, so the female aspect is expected to be well taken into account. Computing Science, AI, etc. are considered to be a male-dominated and male-favoring environment, which is a reason for emphasizing the presence of a female perspective that might otherwise be neglected' (Computer and Information Sciences)). Other applications suggest that the sex and/or gender perspectives will be accounted for by requiring that men and women switch tasks during the assignment: 'Unlike the conventional division of labor, where men were engaged in outdoor sampling and women performed indoor analysis, the very difference is that in our project, female researchers are more involved in outdoor sampling and analysis of first-hand data, while male researchers are responsible for sample analysis and data modeling' (Earth and Related Environmental Sciences).

Several proposals contain personal reflections that revolve around the relation between researchers' gender and the research conducted. A male physicist stands out as one of the few reflections by men on the male 'standpoint':

> All my understanding, all my ideas, and interests are inevitably colored by the experiences I have made and do as one does in the sociocultural sphere I am part of. Based on the attributes I am ascribed with as a man, there are implicit and explicit expectations of me in the way I think, act, and function. This affects me, consciously and unconsciously, at all levels and not the least in my research where it has impact on my science question, choice of study object and selection. Thus, it is central to my scientific method that I reflect on this influence and that I try as far as possible to ensure that my research, throughout the process, becomes as gender neutral as possible. (Physical Sciences)

Another type of personal reflection found in the material centers on the social aspect of being a man or a woman in science, with women typically sharing their experiences of discrimination and gender bias. An author of a Chemical Engineering proposal writes: 'Being a woman working in Chemistry and Engineering myself I realize challenges from unconscious to sometimes conscious bias and skepticism against women working in these areas.' Other personal experiences are also lifted as guarantees of sex and/or gender awareness. One applicant writes: 'I am personally close to a person from a non-visible minority which makes me particularly sensitive to these questions' (Physical Sciences). Having

Figure 4. Timing of projected applications of research results in relation to the carrying out of the proposed research project.

acquired skills to detect and deal with gender bias in the work group is also lifted as qualification, as is a track record of having promoted female researchers in the past. Lastly, many applicants put forth department- or university-level policies and practices that aim to enhance gender equality and counteract discrimination as assurances that these issues will be dealt with.

5.1.3 Impact-centered strategies

The impact-centered strategy is the least common type in our material. Among the 'yes' motivations, this type of strategy features in 19 per cent ($n = 44$) of the applications. Earth and Related Environmental Sciences proposals are most likely to contain this strategy; it is also common in the Medical Engineering and Chemical Sciences.

We categorize the moves that mobilize the impact-centered strategy in terms of the area of inequality (e.g. health) the research is said to address as well as the stated relation between the expected research results and their societal applicability. We suggest that the latter can be understood in terms of a spectrum ranging from proximate to distal, where the former represents projections about future applications that foreseen research results will have a close relation (temporally, spatially, and/or in terms of significance) to the research and the latter end represents a more remote relation between research outcomes and applications (Fig. 4). An example may be research into a medical treatment expected to have variable effects on men and women—such research may result in positive impacts fairly soon and/or may affect a large population.

About a quarter of the moves belong to the first subcategory: they describe how the planned research will have an impact that is proximate to some aspect of gender inequality. Exclusively, these moves address gender inequality in the health and well-being area. One statement reads: 'Women suffer disproportionately from urinary tract infections, and infections during childbirth; effective antibiotics will help ensure healthier lives for women and girls, thus playing a significant part in achieving gender equality, indirectly play a part in promoting equal access to educational opportunities, and help to reduce inequalities between the genders' (Biological Sciences). Other statements describe research results that may have an impact on the development of gender-specific drug conjugates, a bio-responsive camera that will enable a better understanding of differences between the male and female gastro-intestinal system and functions and wound-healing techniques (where the latter would benefit the health and well-being of women more than men, given that women, on average, live longer).

The remaining three-quarters of the impact-related moves describe impacts that could be seen as distal to the area of concern. Our assessment is primarily based on the description (or lack thereof) of the causal relation between the planned research output and the sketched impact on gender inequality. Typically, this relation is long term, uncertain, and presupposes a set of unspecified contingencies. A case in point is this:

> [A]n implicit effect of the research outcome can be to facilitate the potential development of a small-scale power production technique that could be applied in worldwide rural areas, where lack of electricity has large consequences for the community, not the least for daily family life and health. (Mechanical Engineering)

Another illustrative example of a distal relationship between research outputs and potential effects on inequality between men and women is given by this Biological Sciences proposal: 'The findings on sex differences in the immune system and in relation to aging in birds, I believe can inspire research also in humans, which in the long run could contribute to gender equality.' The most common areas of gender inequalities addressed by moves focusing on distal impacts are energy poverty, effects of extreme weather events, economic inequality, health, and democracy.

5.2 'No' motivations

Table 4 quantifies how often the different strategies occur in the ten most common disciplines among the 'no' proposals. The table is ordered by percentage from highest to lowest, where a high percentage represents a larger share of the total number of 'no' proposals. Since one motivation can feature several strategies, the columns for each discipline add up to >100 per cent. In comparison to the dominance of Biological Sciences in the 'yes' proposals, the 'no' proposals are much more evenly distributed across disciplines.

Qualitatively, the moves mobilizing the content-centered strategy in the 'no' motivations are the inverse of those in the 'yes' motivations: they refer to the content of the proposed project to motivate why there is *no* reason to include the sex or gender perspective in the proposed research. Apart from this, the structure of these moves is not all that different: they vary in terms of both length and depth but compared to the average content-centered move in a 'yes' motivation, those used to motivate the lack of a sex or gender perspective in the content of the research tend to be shorter. Whereas the longer ones essentially contain the same elements as in those found in the 'yes' motivations, the shorter ones range from one-sentence-long announcements like: 'Not relevant to the proposed research', over those that are a little more explicative: 'The research will not deal with living matter' (Physical Sciences) to implicature-type statements like: 'This is particle physics research' (Physical Sciences).

A considerable number of proposals that fall into the content-centered 'no' motivations contain declarations that the proposal writer has tried to understand exactly what the research council is requiring them to consider: 'One notes here that, following the application instructions, the sex and gender perspectives considered here mean those for the research itself and are not concerning gender distribution in research teams' (Physical Sciences). Some have consulted checklists or

guidelines provided by the SRC or others: 'I have carefully read the explanation on sex and gender perspectives provided on VR [SRC]'s website. Based on this detailed explanation, I conclude that sex and gender perspectives are not applicable to our proposed research since it focuses on plants and soils as response variables and on the basic ecological mechanisms that link animals, plants, soils, and carbon' (Biological Sciences).

In total, performer-centered strategies feature in 22 per cent ($n = 211$) of the proposals that do not include the sex or gender perspective (Fig. 3), but it is rarely featured alone (only 4 per cent of the 'no' motivations rely exclusively on this strategy). Surprisingly, the moves that mobilize a performer-centered strategy in the 'no' motivations largely mirror those found in the 'yes': typical statements refer to the gender balance of the research team, an ambition to recruit female researchers, university recruitment policy, etc. In other words, the proposal writer apparently denies that sex and gender perspectives are applicable to the proposed research but nevertheless relies on a move that emphasizes a performer dimension of gender equality, ostensibly to obtain some type of recognition or points in the proposal evaluation.

Impact-centered strategies are found in 13 per cent ($n = 127$) of the 'no' motivations and are more likely to feature in proposals from Electrical Engineering, Electronic Engineering, Information Engineering, Mechanical Engineering, Materials Engineering, and Earth and Related Environmental Sciences. As with performer-centered strategies, the moves used to mobilize the impact-centered strategies largely mirror those found in 'yes' motivations, including the identification of what could be viewed as proximate and distal impacts. One central difference, however, is that when these moves feature in the 'no' motivations, they typically hold that any societal benefits would accrue equally to all genders: 'The outcomes of this research—such as improved solar cell performance contributing to the transition to renewable energy sources—will benefit all sexes and genders equally' (Physical Sciences). Another type of move is to suggest that applying research results is beyond the scope of the proposal, and therefore, perspectives related to application are not relevant. Only one proposal contains a statement to the effect that even a possible societal impact does not necessarily equate to a sex or gender perspective in the research per se—an inference that appears to be implicit in all the impact-centered statements included in the 'no' motivations:

> [A]ny research on global elemental cycling contributes to our knowledge on long-term processes involving i.e. climate change. Thus, this research might be relevant for future activities on the front of energy needs related to sex, which are different for different sexes. Nevertheless, in our opinion such remote connection between the proposed research and energy needs of different societies does not justify a statement that this particular research includes gender or sex perspectives. (Earth and Related Environmental Sciences)

One last variant found in this category is the complete denial that the research could have an application that is relevant to humankind, and therefore there is no sex or gender perspective related to the proposed research.

5.3 Combinations of strategies

The more common motivation (75 per cent of all 1,189) features only one strategy (typically the content-centered, which features alone in 66 per cent of all motivations).[4] This subsection focuses on the quarter of the proposals that features *more* than one strategy.

When analyzing the use of several strategies across the 'yes' and 'no' motivations, one notes that 'yes' motivations feature single strategies more often than the 'no' motivations (Fig. 5). We find that the large number of 'yes' proposals that rely exclusively on one single strategy reflects the reliance on the content-centered strategy in the Biological Sciences proposals, which dominates the batch of proposals in the 'yes' category (Tables 1 and 3). In the 'no' proposals, where the content-centered strategy is common across a larger number of disciplines, it more often features in combination with the two other strategies.

When it comes to proposals that rely on a performer- or impact-centered strategy, we find striking differences between the 'yes' and 'no' motivations (Fig. 6a and Figure 6). Authors of 'no' motivations typically use these two strategies in combination with the content-centered strategy, whereas authors of 'yes' motivations often rely only on these two strategies alone. It appears, in general, that applicants who deny the relevance of the sex and gender perspectives for their research feel a need to motivate their claim in several ways, whereas researchers including it are more likely to rely on a single strategy to back their response.

Applicants that rely on strategy combinations in the 'yes' motivations typically have a 'yes–yes' structure, i.e. they tend to argue that there are sex and/or gender aspects to *both* the research content and the actors involved (and/or possible impacts). In other words, these applicants do not add a performer- or impact-related move to compensate for the lack of sex and/or gender aspects in the content of the proposed research but rather combine them to reinforce the 'yes'. For example:

> The central topic of the research proposal is gender-dependent selection in plants that are both male and female simultaneously. A gender perspective is thus highly integrated. I lead a gender-balanced research group, both in terms of organization (female and male members) and participation. (Biological Sciences)

This type of the 'yes–yes' structure contrasts with the moves used to realize combination approaches in the 'no' motivations, where we see two types of approaches. First, we find moves that explicitly deny sex or gender perspectives in the content of the research but highlight them instead with respect to the application of research results or the researchers themselves (and/or their actions). Such arguments often use concessive conjunctions such as 'however', 'nonetheless', and 'that said', which suggest a compensatory argument. For example:

> This proposal tackles behavior of rocks and minerals under extreme conditions as well as deep elemental cycling. Hence, it is purely basic research of deep Earth's interior, which precludes any usage of gender or sex perspectives. However, in a broader perspective any research on global elemental cycling contributes to our knowledge on long-term processes involving i.e. climate change. Thus, this
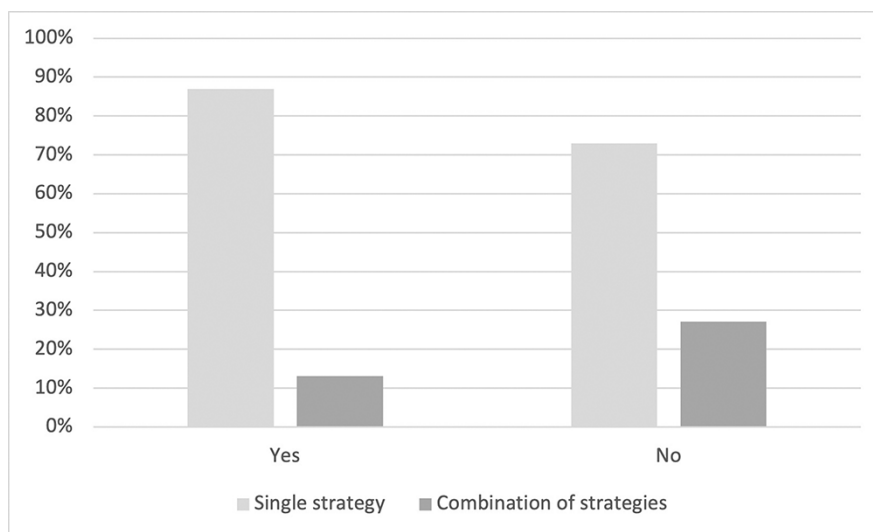
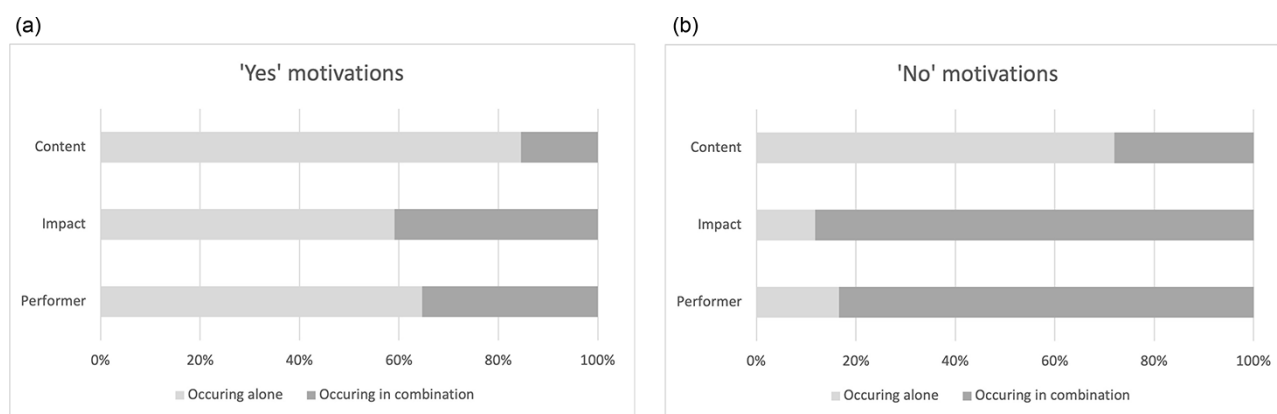**Figure 5.** A comparison of strategies used across 'yes' and 'no' motivations (per cent).

Figure 6. (a, b) Single and combined strategies in 'yes' and 'no' motivations.

research might be relevant for future activities on the front of energy needs related to sex, which are different for different sexes. (Earth and Related Environmental Sciences)

Second, we also find moves that can be characterized as 'neither-this-nor-that', indicating that there is no sex or gender perspective in the research content, impacts, and/or actions of the research performers. For example:

The research carried out in the proposed project lies within the pure mathematical field of Partial Differential Equations and Harmonic Analysis, in which no biological characteristics or gender considerations are relevant at any step of the research cycle (implementation, development, and dissemination). The application of the results of the research does not affect human beings either directly or indirectly.

6. Discussion

This article studies the types of effects that arise when researchers are required to consider integrating the sex and gender perspectives into their proposed research. The study

represents a baseline of sorts—it only includes an initial year of data and does not compare across the treated and control groups—and therefore does *not* represent an evaluation of the implementation of this requirement.

We conducted a detailed qualitative analysis of nearly 1,200 research proposals to examine how proposal writers motivate the inclusion or exclusion of the sex and gender perspectives in their proposed research. Of the proposals reviewed, 19 per cent ($n = 229$) include one or both perspectives ('yes' motivations). We categorized both 'yes' and 'no' motivations in terms of three overarching strategies upon which applicants relied, including those centered on (1) the content of the proposed research, (2) the future impact of the research, and (3) the researchers who perform the research, including actions they may take during the research. Figure 7 provides a stylized summary of the six possible strategy uses across all motivations (combinations not included), where (A) can be seen as the preferred policy outcome, given that the stated desire is to influence the content of research.

Notably, 155 of the 229 proposals that motivated the inclusion of a sex or gender perspective relied on a content-centered strategy (A in Fig. 7). More than two-thirds of these are found within Biological Sciences, Computer and Information Sciences, and Medical Engineering, where, judging
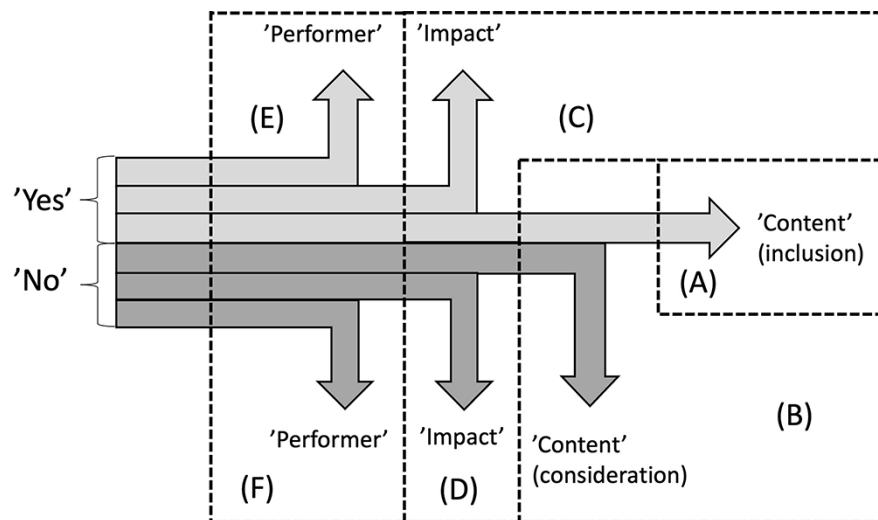
Figure 7. Stylized summary of possible responses with respect to integrating the sex and gender perspectives into research content.

from the proposals, the integration of the sex or gender perspective is generally more easily accomplished and often even considered *comme-il-faut*. These results are consistent with previous research focusing on proposal writing practices and researchers' response to funding requirements in that they suggest that applicants' inclusion of the sex and gender perspectives is facilitated by the preexistence of a sex- or gender-related methodological, theoretical, or empirical discourse with which they are already familiar.

Nearly 40 per cent of all proposals (both 'yes' and 'no' motivations) featured performer- or impact-centered strategies (C, D, E, and F in Fig. 7), both of which are irrelevant to the requirement, as defined by the funding organization SRC. We can only speculate about possible explanations to this finding. One is that researchers simply failed to understand the requirement (or failed to read the instructions), which could suggest a need to modify the information instruments used for implementation (White et al. 2021). Another possibility is that researchers understood the requirement but failed to see how it connects to their epistemic context and, perhaps, tried to focus instead on aspects that they deem more universally applicable to scientific work (e.g. the characteristics or personal context of researchers themselves or how the research results may impact society).

It is worth noting that both the performer- and impact-centered strategies might not be entirely unreasonable. For example, when proposal writers suggest that they will rely on a gender-blind recruitment process or affirmative action (performer-centered strategy), they are invoking the broad reformative scope of the SRC (which represents more generally the gender mainstreaming goal of Swedish research policy) and that of higher education institutions across Sweden and other European countries. Similarly, proposals that rely on an impact-centered strategy can be considered suboptimal based on the SRC's funding call, but this strategy is nonetheless compatible with another long-standing policy requirement associated with many RFOs: namely, the preference for research that contributes to the social good. Furthermore, while the SRC was explicit in its guidance to researchers that the gender balance of the research team does not represent the integration of the sex and gender

perspectives, it did not provide a clearly defined boundary between the integration of these perspectives in the content of research and the bearing or impact of research results on gender inequality. This suggests that a researcher's use of an impact-centered strategy could be viewed as slightly less 'off the mark' than the use of a performer-centered strategy.

Presumably, researchers' reliance on performer- and impact-centered strategies is both intentional and unintentional. Although our research approach cannot identify which of these two apply, we argue that both are likely at play, given how researchers either used a single strategy or combined different strategies. In the 'yes' motivations, single strategies were particularly prominent, whereas in the 'no' proposals, applicants often combined different rationales. In the latter case, applicants tended to use language that can be described as defensive, such as conjunctive sentence constructions that rely on terms like 'nonetheless' or 'however'. In short, when no straightforward connection to the content of the proposed research could be made, applicants appeared to compensate through a combination of several different explanations for excluding the sex and gender perspectives. On the other hand, resorting to several different strategies could indicate that applicants were simply uncertain about the objective of the requirement and thus hedged their bets by filing all thinkable types of responses.

The variety of motivations we identify in our study raises questions about the desirability of different outcomes and the need for clarification of the exact policy intent of SRC and other funding organizations. For example, is it the desired behavior that researchers do in fact *include* the sex and gender perspectives in their research (outcome (A) in Fig. 7) or is it sufficient to simply *consider* it (outcome (B))? To put it differently, how do funders look at (B) in Fig. 7? Should impact-centered motivations perhaps be considered legitimate and, if so, should both 'C' and 'D' be considered equally prioritized outcomes? If mere consideration of integration is satisfactory, questions about how to evaluate 'no' motivations need to be clarified. Currently, many of the 900+ 'no' motivations that center on the content of the research do not amount to more than a few sentences serving to dismiss the

relevance of the sex and gender perspectives. At face value, these motivations seem rather superficial, but they deserve to be assessed and evaluated based on some established principles that consider the standing of sex- and gender-integrated research in different disciplines.

Lastly, we recommend keeping track of whether and how the distribution of strategies changes over time, with our study potentially serving as a baseline. In the absence of a pretreatment baseline (i.e. the status of sex and gender integration in the STEM fields), follow-up studies will provide information important for drawing conclusions about the effectiveness of the policy instrument and for future tweaking. Here, it would also be of particular interest to compare how the long-term effectiveness of the intervention studied here compares to that of other policy instruments with at least partially comparable features. Previous research has shown that policy messages that draw on normative appeals and social comparison have a greater effect than instructional messages (Ferraro and Price 2013). Furthermore, social comparisons seem to give longer-lasting behavioral change compared to norm-based appeals (Ferraro et al. 2011). This line of research suggests a need to understand the effect and effectiveness of the various measures SRC and other RFOs take to persuade researchers to integrate the sex and gender perspectives.

In addition to these policy recommendations, we will now also suggest several specific ways in which future research could study the longer-term effects of these types of requirements. Previous work has shown that as certain funding and policy incentives are institutionalized, researchers adapt to them in ways that can both reinforce and undermine the intentions of the governing actors (Leišytė 2007; Hellström and Jacob 2017). This suggests a need for a better understanding of how proposal writers 'learn' to respond to these requirements, which would require studying proposals and motivations longitudinally. Presumably, the weight that funders attribute to applicants' considerations of the sex and gender perspectives and, relatedly, the nature and quality of review panels' assessments thereof would seem to be central to such learning. To researchers, both aspects signal the relative importance of these considerations and would thus be interesting to study.

When it comes to changes in the actual research behavior given the requirement and the existing information used by RFOs, we suggest that future research studies proceed in several steps. A first step could be to address possible knock-on effects on researchers' attitudes toward including sex or gender (or other perspectives that an RFO would like to include). Furthermore, we should aim to better understand the extent to which such attitudinal change, over time, translates into changes in research practices. Investigations of this process could draw inspiration from the sociology of science as well as a long history of social psychology research about the relation between attitude and behavior and the variables that affect it. Previous research indicates that a set of actors are central to this process: the assessments and decisions of funders, review panels, journal editors, and reviewers may all have 'endorsing' effects, which can affect if and when the sex and gender perspectives migrate into the mainstream of disciplines (e.g. Fujimura 1987; Gläser 2019; Heesen and Romeijn 2019; Pearse et al. 2019; Whalen 2019).

Conflict of interest statement. None declared.

Notes

1. The Council of Europe defines gender mainstreaming as 'the (re)organisation, improvement, development and evaluation of policy processes, so that a gender equality perspective is incorporated in all policies at all levels and at all stages, by the actors normally involved in policy-making' (Council of Europe 1998: 15). This definition is commonly referred to by European policymakers.
2. https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/forordning-2009975-med-instruktion-for_sfs-2009-975 accessed 19 May 2022.
3. If not otherwise stated, the numbers provided in Sections 5.1–5.2 refer to the total number of times a strategy features in an application and captures both exclusive uses or as part of a combination.
4. The performer- and impact-centered strategies feature alone in 7 and 3 per cent of the proposals, respectively.

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