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Advancing women's representation in top academic positions – what works?

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ABSTRACT

Which gender equality measures do Nordic universities use, and to what extent are the measures effective in increasing the share of women in top academic positions? Based on theories that distinguish between actor and structure-oriented measures, and between strategies of inclusion and transformation, we identified four types of measures: career enhancing measures offered for women, training and awareness-raising measures, organizational responsibility measures and preferential treatment measures. We investigated the use and efficacy of the four types of policy measures in 37 universities in Sweden, Norway and Finland, implemented between 1995 and 2018. The policy data was collected through on structured interviews with universities' HR staff and equality officers. By combining these unique survey data and register data on universities' teaching and research staff we assess the impact of institutional gender equality policy on the gender composition of academics in grade A positions. We find strong growth in the use of organizational responsibility and awareness-raising measures over time, and weaker use of career enhancing measures and preferential treatment. Overall, the institutional measures have a limited effect on the growth in the share of women in grade A positions. Nonetheless, we find that the implementation of structural measures is associated with the growth of women in grade A positions.

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Introduction

Organizational researchers have long argued for the potential of personnel systems in workplaces to prevent discrimination and inequality (Dobbin, Schrage, and Kalev 2015). In addition to the wide range of national regulation, Nordic universities have over the past thirty years applied a variety of measures to address the underrepresentation of women in top academic positions (Husu 2010; Nielsen 2017). The identified measures have included training and coaching of women, diversity training of staff, equality units, and various measures of preferential treatment. The variation in measures reflects the issue's complexity.

Although researchers have extensively conceptualized and theoretically discussed the benefits and potential of various policy measures (Benschop and Verloo 2011; Roos et al. 2020), there is a

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lack of studies on the effects of gender equality policies and interventions in academia and a recurring problem that universities, governments, and researchers seldom evaluate gender equality measures (Heikkilä and Häyrén-Weineståhl 2009). Therefore, despite the large-scale equality work in universities, we still know little about which institutional policy measures work to promote gender equality in academic careers. To our knowledge, apart from the study by Timmers, Willemsen, and Tjzens (2010), no systematic empirical analyzes have been conducted on gender equality measures' potential to increase the share of women in top positions in higher education.

To inform theoretical discussions and ensure efficient gender equality strategies, researchers need to map out and assess the gender equality measures used by research-performing organizations. In this ground-breaking study, we draw on unique survey data about Nordic universities' equality policies coupled with register data on gender composition in teaching and research positions to bridge this research gap. We conduct our research with two main objectives: first, to identify and categorize the types of measures in place and their implementation over time, and second, to investigate which of these policies are associated with an increase in the proportion of women professors at the university level. The Nordic universities are ideal cases for this endeavor, considering their strong traditions of equality work and large number of policies in place on the one hand, and accessible register data on universities' teaching and research personnel on the other hand.

We conducted an interview-based survey on the introduction and timing of various gender equality policies. The survey asked what types of measures Nordic universities had introduced at the institutional level to address gender inequalities in academic careers between 1995 and 2018. The time frame corresponds to years with available register data on universities' teaching and research personnel. The surveyed universities were in Sweden, Norway, and Finland. We use this comprehensive set of data to develop new knowledge about the effectiveness of gender equality policies in academia.

Previous research on gender and diversity measures

Studies analyzing gender equality policies' effects in the Nordic context are sparse. Nielsen (2017) used activities and initiatives stated in gender equality plans to identify various approaches to promote women's advancement in research in Denmark, Norway, and Sweden. Other researchers have also mapped the use of gender equality activities in various Nordic countries and elsewhere (Heikkilä and Häyrén-Weineståhl 2009; Husu 2010).

Few researchers have investigated diversity measures' effects in the labor market in general. Holzer and Neumark's (2006) systematic review of affirmative action policies showed that affirmative action can increase recruitment and employment of women and minorities (the effect is modest). According to the study, women benefited most from affirmative action policies.

Naff and Kellough (2003) studied the effects of diversity programs for promotions, discharges, and voluntary quits in the United States public sector. They found that diversity programs had not been effective in creating better environments for women and minorities. In their study, Williams, Kilanski, and Muller (2014) found that diversity programs that emphasize gender differences can reinforce gendered power relations and may therefore be counterproductive.

In the most comprehensive studies on the effects of diversity programs, researchers have investigated private companies in the United States (Dobbin, Schrage, and Kalev 2015; Kalev, Dobbin, and Kelly 2006). These studies included longitudinal data on firms to investigate the efficacy of various types of measures implemented to promote diversity in the firm's management composition. The authors found that organizations that developed clear responsibility structures concerning diversity produced the best results in terms of management diversity. Reforms for transparency and activities that engage managers in recruiting and training women and minorities for management posts promoted diversity. Meanwhile, those designed to control managerial bias instead led to lower diversity.

Timmers, Willemsen, and Tjzens (2010) studied the efficiency of policies aiming at increasing the number of women professors at Dutch universities. They distinguished between individual measures

(i.e. training, coaching, and mentoring of women), cultural measures (i.e. addressing managerial and organizational bias), and structural measures (i.e. changing recruitment and hiring criteria). They found a small but statistically significant correlation between the use of cultural measures and the proportion of women professors. They also found positive but statistically insignificant correlations between the individual and structural measures and the proportion of women professors.

The scope and efficacy of gender equality measures at the organizational level are likely to depend on the type of institutional context and labor market dynamics in which the organization is embedded. Our study's context includes two distinctive features. First, the study is situated in the regulated Nordic welfare states, which have enacted extensive work-and-family policies and employment protection legislation. Second, the academic setting is different from the private sector because of the logic of the relatively uniform meritocratic system for hiring and promotion. In addition, compared to the private sector, higher education represents a loosely coupled system (Weick 1976) in which hiring and promotion decisions are complex processes involving multiple actors with various ambitions (Pietilä and Pinheiro 2021). For example, the hiring and promotion processes are only to some extent within managerial control, and typically influenced by a mix of internal and external expert committees and reviewers.

In the next section, we outline the theoretical framework for the analyzes and develop expectations of the relationship between the sets of gender equality measures and changes in the proportion of women professors.

Theoretical framework: categorization of gender equality measures

Policies meant to combat gender inequality in organizations can be studied from several perspectives. In this study, we track the measures the organizations have implemented to improve gender equality. We distinguish between policies that target *individuals* and those that target *organizational structures* (Benschop and Verloo 2011). Actor-oriented policies include measures that aim to improve the careers of members of the underrepresented sex. They also include training measures for academic staff or gatekeepers, such as managers or recruitment committee members, to reduce gender-based bias and stereotyping. Structure-oriented policies include measures establishing organizational responsibility and measures representing preferential treatment.

Our second analytical dimension is the division between *inclusion* and *transformation*. A policy of inclusion (Benschop and Verloo 2011; Squires 2008) entails that gender inequalities exist due to the exclusion of women in various contexts. Therefore, it seeks to include women in areas where they have been excluded. Inclusion means that women need to adapt to a male norm in society, either by being 'added in' or by being compensated for relevant disadvantages. A policy of transformation instead problematizes gendered structures and seeks to change individuals or structures to transform organizational cultures and practices within which inequalities are embedded (Squires 2008). Table 1 below shows our four categories of measures: individual inclusion, structural inclusion, individual transformation, and structural transformation.

Individual inclusion – career-enhancing measures for women

Career-enhancing measures target women and seek to remedy their 'deficiencies' so that they would have better chances of advancing in the prevailing career structures. Gender differences are

Table 1. Dimensions of gender equality measures.

	Individual	Structural
Inclusion	Career-enhancing measures for women	Preferential treatment measures
Transformation	Training and awareness-raising measures	Organizational responsibility measures

Note: categorization inspired by Benschop and Verloo (2011).

addressed by measures that aim to 'fix' women by changing their individual behaviors and choices (Kalev, Dobbin, and Kelly 2006). The assumption is that some women lack the required knowledge or networks or behave in ways that make them less competitive, for example, by not taking enough risks or not applying for promotion. Leadership programs, coaching, networking, and mentoring programs designed specifically for women are expected to support women by giving them the kinds of relationships that (white) men enjoy through the old-boys network.

Previous research on the effects of these individual-oriented measures is mixed. Some studies have shown that mentoring programs have positive effects on academic success (Gardiner et al. 2007; Ginther et al. 2020), while other studies have shown only modest effects (Kalev, Dobbin, and Kelly 2006). We expect many universities to include career-enhancing measures in their portfolio because they are quite easy to implement.

We expect these measures to display a weak association with an increase in female professorships because many of them aim to promote women's careers by dedicated support structures, such as inclusion in research networks, and mentoring programs. The effects of such measures on research productivity and thus the chances for achieving professorship are unclear. The exception is measures that directly stimulate research productivity, such as funding and research leaves for women.

Individual transformation – training and awareness-raising measures

Although academia is often presented as gender neutral, research has shown that many practices in fact privilege men (Broadbridge and Hearn 2008). Processes of assessment, selection, and evaluation risk to be performed by biased managers and gatekeepers (Bohnet 2016). Training measures, therefore, seek to create awareness among teaching and research staff, managers, and gatekeepers who might have implicit biases or stereotypes that may reproduce existing patterns of inequality (Kalev, Dobbin, and Kelly 2006). These measures target staff members' norms and values in an organization, especially department heads and members of recruitment and promotion committees.

However, extensive research has shown that training does not necessarily change bias (Forscher et al. 2019; Kulik and Roberson 2008; Paluck and Green 2009). A recent study by Nelson and Zippel (2021) further problematizes the widespread focus on implicit bias in academia, concluding that it individualizes gender equality, and possibly obscures the structural roots of inequality. They argue that the concept is widely adopted because implicit bias training as a measure to combat inequality is relatively easy to implement. Training measures have in previous studies consistently been associated with no or even negative outcomes (Chang et al. 2019; Dobbin and Kalev 2018; Dobbin, Schrage, and Kalev 2015; Kalev, Dobbin, and Kelly 2006; Timmers, Willemsen, and Tijdens 2010). Only extensive training in the form of, for example, college courses has proven to have some effects (Devine et al. 2012). One exception is the study by Chang et al. (2019), who found a one-hour bias-training program to have effect on follow-up behavioral measures among female and minority subgroups (2019, 7781).

Dobbin and Kalev (2018) put forward several reasons why diversity training is not effective. Short-term educational interventions in general do not change people. Field and laboratory studies have shown that asking people to suppress stereotypes tends to reinforce them and that the training, instead of reducing bias, serves to activate it. Moreover, Kaiser et al. (2013) suggested that training inspires unrealistic confidence in antidiscrimination programs and that employees who go through diversity training might take less responsibility for avoiding discrimination. In addition, training measures may serve to signal an organization's awareness of gender issues. Naff and Kellough (2003) showed that organizations with lower levels of female representation used more training measures. Fewer women in the workforce might signal a need for action to manifest organization's engagement in gender issues.

We expect training and awareness-raising measures to be in use at the universities for several reasons. First, these measures aim to combat gender bias among decision-makers, and training is a strong signal that the universities are 'doing something' to counter inequality. Second, training

is relatively easy to implement because it requires few resources. Third, the increased emphasis on ethnic diversity can fuel the use of training measures to achieve equality and to improve working conditions.

We do not expect training measures to be associated with an increase in female professors. Diversity training and training on sexual harassment are only loosely coupled to women's career progression. The theoretical arguments about training's lack of effects or even negative effects (Dobbin and Kalev 2018) are likely to be valid also in the academic context.

Structural inclusion – preferential-treatment measures

Even though the principles of equal treatment and non-discrimination inform current practice, most universities have long histories of excluding women. This history may necessitate policies that compensate historically excluded groups with the help of preferential treatment (Ragins and Sundstrom 1989). Preferential treatment involves positive discrimination to correct underrepresentation or historical disadvantage that goes beyond non-discrimination and is defined as an exemption from the prohibition against discrimination (Reisel 2015). Such measures may entail recruitment and promotion procedures in favor of the underrepresented sex, such as earmarked funding for women, or organizational incentives to recruit women academics. Some of these types of measures have been discontinued in Nordic academia due to restrictions regarding the use of preferential treatment defined through the European court system's judicial practice (Reisel 2015).

The number of international studies that have been conducted to investigate preferential-treatment measures' effects is limited, and the few studies on the effects of affirmative action plans are inconclusive (Kalev, Dobbin, and Kelly 2006) or reveal limited use and low impact (Holzer and Neumark 2006). Due to the tradition of using preferential treatment in the Nordic countries, we expect to find these types of measures in our data although they can be costlier and more controversial than the measures in the other categories.

We expect preferential treatment measures to display a positive association with the share of female professors because they target the hiring and promotion of women with either positions or funding. Therefore, these measures have a greater potential to create change than 'softer' measures.

Structural transformation – organizational-responsibility measures

Organizational-responsibility measures seek to make structural changes in organizations by changing the way rules, structures, decisions, and processes are organized, such as by increasing representation or transparency within the organization. Even if a policy sets the direction for change, such as to increase women's representation among professors, this goal can be lost if the policy is decoupled from the organization's overall goals and objectives. If diversity efforts become everyone's responsibility, they may become no one's primary responsibility and risk being lost when line managers need to meet competing demands from scholars (Kalev, Dobbin, and Kelly 2006). The way to solve this problem is to assign responsibility for setting goals, allocating means, and evaluating progress, which can take the form of action plans, internal monitoring, and the introduction of diversity committees. According to Kalev, Dobbin, and Kelly (2006), responsibility structures also make other measures, such as diversity training, networking, and mentoring programs, more effective.

Important parts of what constitute organizational responsibility measures in international research (e.g. Kalev, Dobbin, and Kelly 2006) are regulated at the national level in the Nordic countries (Silander et al. 2022). For example, the requirement to have a gender equality plan and salary reviews by sex are set in national legislation in Sweden, Norway, and Finland.

Previous studies have shown that equality officers or equality units can contribute by promoting equity, tracking changes made in law, and finding new equality opportunities (Pitts 2007). In the Nordic countries, equality officers and units play less of a monitoring role than what is the case in many other countries. In the Nordic countries, they can serve to push gender issues forward and coordinate institutional measures, but in relation to recruitment, their influence is limited. Nevertheless, equality officers can work to increase the pool of applicants, thereby increasing diversity in hiring (Holzer and Neumark 2006).

The number of organizational responsibility measures is limited in our study because many such measures are regulated in national legislation. We still expect a widespread use of organizational responsibility measures because the promotion of gender equality often has a strategic position in Nordic universities' HR policies.

Based on previous research, we expect organizational measures to display a positive association with the increase of female professors.

Data

The study combines unique survey data and university register data to assess the impact of institutional gender equality policy measures on the gender composition of full professors and similarly ranked academic top positions ('Professors').

Survey data

Between 2018 and 2020, we conducted a survey of Swedish, Norwegian, and Finnish universities' gender equality and diversity policies. We based the survey design on Kalev and Dobbin's work on diversity management in the United States. Data collection followed a similar process as in the studies by Dobbin, Schrage, and Kalev (2015) and Timmers, Willemsen, and Tjzens (2010), including questions on universities' formal central-level measures to promote gender equality and diversity as well as the timing of policies (start and end year). The survey covered the years from 1995 to the time of interview, which we set to 2018 for all.

The research group worked together to develop the survey and to collect and analyze data, enabling us to verify consistency in the interpretation of questions and answers across the countries and universities. The survey was comprehensive and included around 90 questions about universities' central-level gender equality and diversity policies. The survey did not cover department specific policies or bottom-up initiatives. For this analysis, we use the measures included in the four categories of policy measures as outlined in our theoretical framework. These categories included measures that universities voluntarily adopt in their gender equality work. We excluded measures derived from national legislation (Appendix C).

We sampled all higher education institutions in Sweden, Norway and Finland that had a legal status as a university in 2018, a total of 42 universities. 38 universities agreed to participate in the study. Because one of these 38 universities merged into another in 2019, we use a total of 37 universities in our sample. Sweden and Norway have data up to 2020, whereas the Finnish data ends in 2018 (Appendix B).

We conducted interviews face-to-face, in video calls, and over the phone. We aimed to cover active policies in the timeframe from 1995 up to the time of the interview. Most survey respondents represented universities' human resources personnel or equality coordinators. In many cases, we conducted interviews with several people per university, which increases the answers' reliability and reduces problems related to the lack of institutional memory. In addition to the interviews, we consulted written sources (e.g. publication dates for grievance procedures on the university's homepage). When no information on the timing was available, we treated the response as missing data (Appendix C).

In the case of mergers, we aimed to back-trace the original universities' policies. This process proved most difficult for Finland, which has had several mergers. Therefore, three Finnish universities first entered our data only after 2010.

Register data on universities' teaching and research staff

To trace the development in the proportion of women in professor positions, we used register data on teaching and research staff from mid-1990s to 2020, with some variation across countries and universities, derived from the official databases for higher education statistics in Sweden, Norway, and Finland (DBH in Norway 2017; Statistics Sweden 2021, Vipunen – Education Statistics/KOTA Database Finland 2018).

Because we used survey data and the university landscape in 2020 as our starting point, we needed to account for the changes up to 2020. Between 1995 and 2020 several mergers and expansions of former universities took place, especially in Norway and Finland. In our calculations, we back-tracked the universities from 2020 and used the pre-existing universities' staff composition as a basis for analyzes (Appendix A and B).

Variables

The dependent variable is the percentage of women in professor positions in each university. This variable contains information in university-year units and varies between 0 and 100.

The main independent variables are the four additive indices: career-enhancing measures for women, training and awareness-raising measures, organizational responsibility measures, and preferential measures. These indices consist of six, five, three, and three policy measure items, respectively. The index scores indicate on a year-to-year basis the number of policies in place per index (0 – zero policies, 1 – one policy, 2 – two policies etc.) (see Appendix C).

We adjust the analysis for a curvilinear function of year, and the percentage of women in academic grades below professor-level per university-year unit (e.g. postdoctoral researchers, associate professors, and university researchers). These staff represent the internal 'recruitment pool' for professorships. The measure for women in these lower-level grades is centered on the grand mean.

Methods

We used fixed-effects regression to estimate the correlation between the implementation of policies and the proportion of women in professor positions, adjusted for the yearly trend and proportion of women in lower-level academic positions. We lagged the policy measures by three years to reduce the influence of reverse causation.¹ Therefore, the estimated change in women in professor positions are regressed on measures implemented or removed three years earlier. For example, if a university has implemented a gender equality policy to remedy weakening female recruitment, the policies could produce a negative correlation when policies and outcomes are measured simultaneously. The time lag on the independent variables reduces this problem, and it makes theoretical sense because it takes time to qualify staff for professor positions, and for hiring and promotion processes to be fully accomplished. Because of the time lag, we measure the effect of policies implemented in 1995 and onwards to 2017 on the proportion of women professors in 1998–2020, with some variation. The number of university-year units in our regression sample is 744 (see Appendix B on included time periods).

A fixed-effects regression only uses information about change over time within the same unit to estimate the correlation between the independent and dependent variables. Therefore, the regression efficiently controls for the universities' time-invariant observable and unobservable characteristics, such as country and geography and, to some extent, disciplinary profile, and academic status. The benefit of the within-estimator is that we come closer to a causal estimation of

various policy measures' effects on the proportion of women in professor positions compared to a random-effects estimation, which combines variation within and between universities. Universities can have different motivations for the introduction of gender equality policies, and if universities with high female recruitment introduce more measures to portray their 'female friendliness' profile, an estimator that combines within- and between-variation could make policies appear more effective than they really are. In the same vein, we also include a three-year lagged measure of the percentage of females in academic grades below professor-level.

The disadvantage of the within-estimator is that it only uses data from universities that change policies at least once. If little changes in the data's status, this model presents less information to use in the estimation, and limited variability can result in higher standard errors. Therefore, the fixed-effects model provides a more conservative estimation than the random-effects models. Random-effects models, in contrast, use all data points, including those from universities that do not implement policies. We include a random-effects regression in Appendix B. The main results do not change.

Results

Descriptive results

Table 2 presents the descriptive statistics of the dependent and main independent variables. First, the overall average share of women professor positions was 22.39%. We observed substantial variation across university-years, as the lowest share was 0% and the highest was 83.33%.

Policy measures' mean scores (Table 2) revealed a low use of gender equality measures. This is due to a short time horizon on measures and/or few universities applying them. The minimum and maximum scores showed that our sample contained universities that have applied all policy measures within each category at some point in time, and some combinations of university-years that applied none. One exception was training and awareness-raising measures, which included

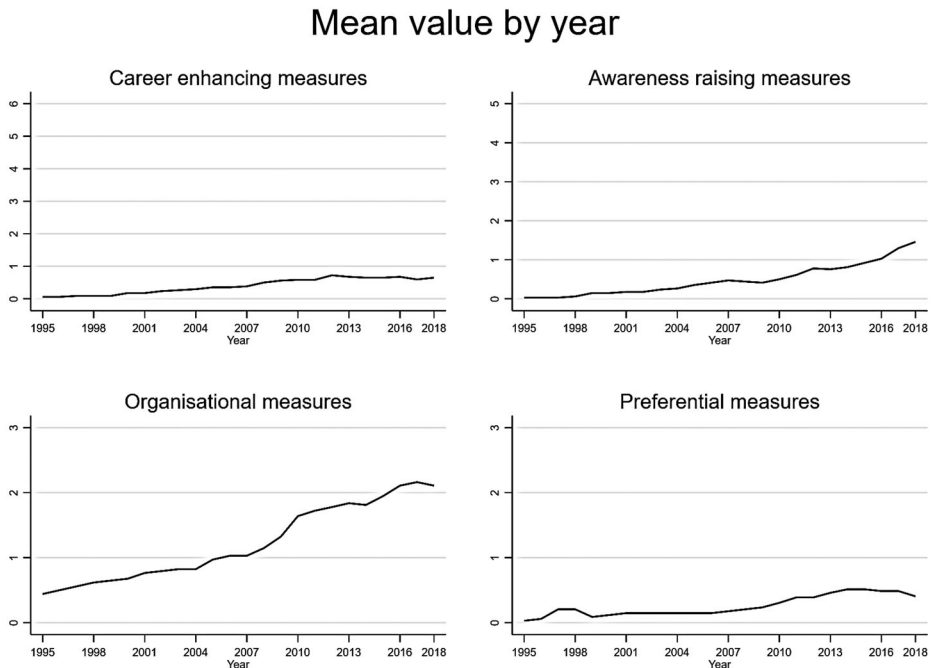


Figure 1. Yearly mean score of each gender equality measure.

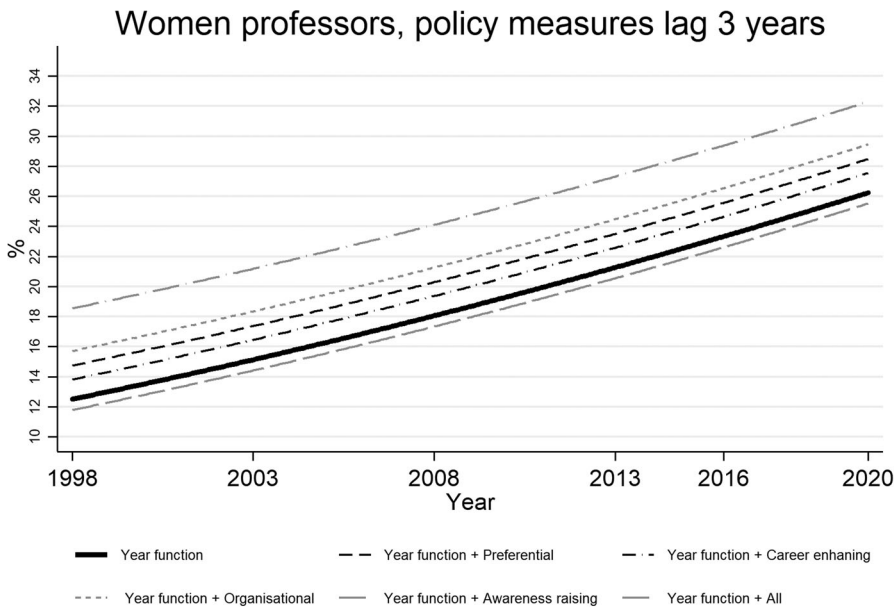


Figure 2. Change in the share of women in professor positions due to gender equality policies (maximum values, see Table 3 Model 5).

six policy items but had an observed maximum value of 5. Because of this, we set the maximum value to 5 for training and awareness-raising measures when predicting mean scores in Figures 1 and 2.

Figure 1 displays the yearly mean score for each type of gender equality measure. Two patterns are clearly discernible. First, over the years, universities have increased their use of measures within each policy category. The most significant increases were for training and awareness-raising measures and organizational responsibility measures. It may be that these develop in concert, as training and awareness-raising measures can be a product of the organization's systematic gender equality work. Second, organizational responsibility measures were most widespread: and in descending order, training and awareness-raising measures, preferential measures, and career-enhancing measures.

Regression results

The fixed-effects regression in Table 3 displays the changes in the shares of women in professor positions associated with the implementation or removal of different policies.² Models 1–4 tested for the effect of each category of gender equality measures separately, but with control for the time function and the share of women in lower-level academic positions. In Model 5, we included all indices and tested for the effects of gender equality measures under joint control for the other indices as well as the control variables. As evident in Table 3, active universities implemented more than one category of policies.

The point estimates for the indices on career-enhancing measures, organizational responsibility measures, and preferential measures were all above zero. On average, the introduction of these measures raised the share of women in professor positions adjusted for the year-to-year development as well as the share of women in lower-level academic positions. The point estimate for the index on training and awareness-raising measures, however, was below zero, indicating that these measures negatively correlated with the share of women in professor positions. In Model 5, only organizational responsibility measures reached statistical significance. The standard errors of

Table 3. Fixed effects regression with 3 year lag. Dependent variable: share of women in professor positions.

	Model 1	Model 2	Model 3	Model 4	Model 5
Year	.442** (0.134)	.445*** (0.135)	.461*** (0.134)	.492*** (0.136)	.496*** (0.135)
Year squared	.011* (0.005)	.011* (0.005)	0.007 (0.005)	0.009 (0.005)	0.006 (0.005)
Women below professor level	.122** (0.041)	.128** (0.041)	.116** (0.040)	.112** (0.041)	.096* (0.041)
Career enhancing (L3)	0.351 (0.307)				0.219 (0.315)
Awareness raising (L3)		−0.100 (0.323)			−0.144 (0.321)
Organizational (L3)			1.127** (0.353)		1.069** (0.355)
Preferential (L3)				.969* (0.435)	0.746 (0.450)
Constant	13.485*** (0.921)	13.540*** (0.921)	12.861*** (0.939)	13.123*** (0.937)	12.508*** (0.955)
Observations	744	744	744	744	744
r2 within	0.578	0.577	0.583	0.580	0.586
r2 overall	0.372	0.386	0.382	0.356	0.339
r2 between	0.393	0.432	0.378	0.336	0.223

Standard errors in parentheses.

* $p < .05$, ** $p < .01$, *** $p < .001$.

the remaining indices were greater than the point estimate, which signaled a high degree of variation in the effects of measures across universities or within indices: one type of policy might have a positive effect, whereas another can have none or even a negative effect.

The share of women in professor positions increased by 0.496 percentage points on average (Model 5). This amounts to 16 percentage points' increase in the share of women over the study period (see Figure 2). Second, a 1 percentage-point increase in the share of women among lower-level academic staff resulted in a 0.096 percentage-point increase in women in professor positions.

Figure 2 displays the shift in the curve of women in professor positions given the maximum values of all policy measure indices. The grey dotted line for organizational responsibility measures yields a 3.2 percentage-point increase in women in professor positions (1.069×3); the black dash-dotted line for career-enhancing measures yields a 1.3 percentage-point increase (0.219×6); the black dashed line for preferential measures visualizes a 2.2 percentage-point increase in women in professor positions (0.746×3); finally, the grey long-dashed line for training and awareness-raising measures on average decreases the share of women in professor positions by -0.72 percentage points (-0.144×5). Our mathematical model suggests that a university which implements all the tools in the training and awareness-raising toolbox without any other types of measures can theoretically expect to reduce its share of women in professor positions. According to Table 2, some universities in our sample implemented all policies within each category, but the average was just one to two measures per category.

Finally, the grey long-dash-dotted line illustrates that a university which implements all policy measures can expect an increase in the share of women in professor positions of 6.4 percentage points. Compared to the time trend (the thick black line), which increased by 16 percentage points over the observational period, policies seem to make a modest to medium difference.

Table 3 and Figure 2 display the average effect of each category and visualize the effect of policy against the time function and lower-level female recruitment. In line with previous research, the different policies within categories can have different and opposing effects on gender equality work, and hence, gender balance. In the next section, we open the indices and show the effect of the different policies that make up career-enhancing measures for women, training and awareness-raising measures, organizational responsibility measures, and preferential treatment measures.

Table 2. Summary statistics for women professors and gender equality measures.

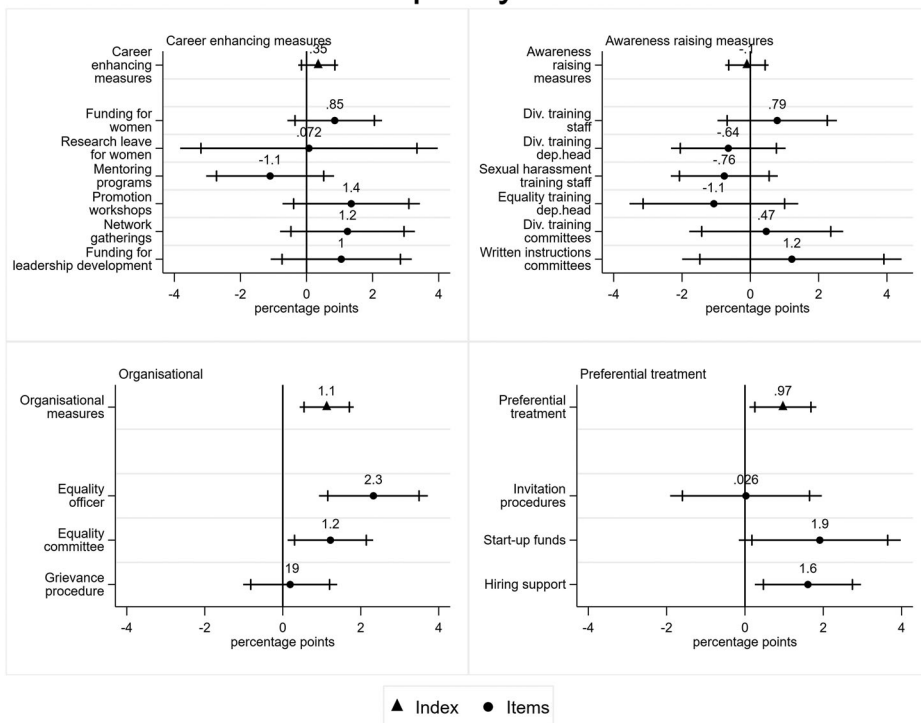
Descriptive statistics					
Variable	Obs	Mean	Std. Dev.	Min	Max
Women professors	744	22.39	10.11	0	83.33
Targeted	744	.49	1.1	0	6
Training	744	.64	1.05	0	5
Organizational	744	1.44	.96	0	3
Preferential	744	.32	.7	0	3

Index and single items

Figure 3 displays the within-estimator for each item that comprises the four indices.³ Each item was regressed on the share of women in professor positions adjusted for the curvilinear year function and the share of women in lower-level academic positions. The items and the share of women in lower-level positions were lagged three years. Figure 3 displays results with conventional 95% confidence intervals and 90% confidence intervals (capped lines).

Our analysis revealed that all indices contained policy measures with positive and negative effects on the gender composition in professor positions. This was most pronounced for training and awareness-raising measures, where three measures were negatively associated with the share of women in professor positions. If a university introduces diversity training or equality training for department heads or sexual harassment training for staff, this was associated with a lesser share of women after introduction compared to before.

Gender equality measures



Capped lines represent 90% CIs.

Figure 3. Individual gender equality measures.

Interestingly, the only two significant policy measures were both structural measures: creating an office or a full-time position devoted to gender equality and diversity issues ('equality officer'); and providing earmarking, funds, or faculty lines to support hiring members of the underrepresented sex ('hiring support'). Special funds for start-up packages to support hiring female academic staff also stood out as having great potential effects and were significant at the 90% level ('start-up funds'). However, we observed that the point estimates of some of the career-enhancing measures for women (e.g. promotion or tenure workshops for female academic staff, networking gatherings for women academic leaders, and funding for women academics' participation in leadership development programs) had point estimates of approximately 1.1–1.3 percentage points. These policies seemed to have an effect, but its variation was too great and unsystematic to draw a firm conclusion on positive effects on the gender balance. In contrast to organizational responsibility measures, which about half of all universities implemented, career-enhancing measures for women were less widespread across universities or over time. Hence, we lacked enough information to reveal systematic patterns on some policies' effects.

Discussion and conclusion

We set out to investigate the types of gender equality measures used in universities in three Nordic countries and their association with the increased share of women in professorial positions. We used a state-of-the-art dataset to assess the relationship between gender equality measures' use and developments in the share of women professors at the university level. We investigated four categories of measures and 18 individual measures. Our results reveal unique information about the use of measures and their potential effects.

First, our mapping revealed that Nordic universities have used an increased number of university-level gender equality measures. At this level, changes were sought through organizational responsibility measures in the forms of committees, formal grievance procedures, and diversity offices or officers. The limited use of career-enhancing measures for women and preferential treatment implies that these approaches are either considered less relevant or more controversial to implement in a Nordic academic context. We also observed an increase in training and awareness-raising measures, and a weak increase in preferential treatment.

Our results reveal that university-wide equality measures contributed relatively little to overall growth in the share of women professors over the investigated period. This might be expected due to the complexity of academic recruitment and promotion processes and the difficulty of implementing policies. In line with our theoretical expectations, organizational responsibility measures seem to have had the strongest effect. According to our mathematical model, implementing career-enhancing measures, organizational responsibility, and preferential treatment measures in concert increases the share of women in professorships by 2–4 percentage points relative to not doing anything.

When we broke down the various types of structural measures into their individual measures, we found that two measures stood out as particularly important: earmarking funds or lines for hiring members of the underrepresented sex (largely discontinued due to European anti-discrimination legislation) and having an equality officer or office within the institution. Whereas most of the other measures are intended to influence the share of women professors indirectly, preferential treatment measures are expected to affect the share of women more directly. Thus, it is not surprising that earmarking stands out as one of the most efficient ways of contributing to numerical equality.

Organizational responsibility measures aim to change the way an organization operates. Of all the measures we evaluated, having an equality officer or office seemed to have the greatest individual effect. This may indicate that having an equality officer or office in place strengthens the effects of other institutional efforts by establishing an organizational responsibility structure and dedicating resources to oversight and implementation. In line with the study by Dobbin and Kaley (2013),

our overall results indicated that equality officers or offices play an important role in reaching gender equality.

The composition of the organizational responsibility measures is quite different in the Nordic context compared to other countries. Previous research (Dobbin, Schrage, and Kalev 2015; Kalev, Dobbin, and Kelly 2006) mainly focused on the monitoring mechanism of organizational responsibility measures, while the role played by equality and/or diversity units or officers in Nordic universities focuses more on oversight and advocacy (cf. Kalev, Dobbin, and Kelly 2006). Having an equality committee in place in Nordic universities is positively correlated with the increase of women professors. In the Nordic context, equality committees represent important organizational structures for responsibility, and via their oversight role they may, for example, catalyze the transparency of recruitment processes.

Our findings concerning training and awareness-raising measures' lack of significant effects are in line with several previous studies (Dobbin and Kalev 2018; Dobbin, Schrage, and Kalev 2015; Kalev, Dobbin, and Kelly 2006; Kellough and Naff 2004; Timmers, Willemsen, and Tijdens 2010). The findings imply that ambitions to transform an organization by training or by raising awareness among teaching staff, managers, and gatekeepers do not change the structures of inequality. As indicated by other research, gender bias towards women's competence and hireability might not be the key explanation of the persistent gender gap in Nordic academia (cf. Carlsson et al. 2021). As Nelson and Zippel (2021) point out, the focus on addressing implicit bias can distort focus away from other causes of inequality. Thus, offering more bias training does not seem to be the solution to gender inequalities in Nordic universities.

The increased use of structure-oriented measures has shifted the focus towards aiming at 'fixing the organization' rather than 'fixing the individuals.' However, we also noted a change in the mix of measures used, with a trend towards softer and more gender-neutral measures. Instead of focusing on women specifically, universities now prefer to use measures that apply to the whole organization. Controversial measures such as preferential treatment policies are likely to be perceived as less available over time due to the limitations specified in European legislation. More research will be needed on this matter, considering the observed direct positive effect of preferential treatment measures.

Our study provided new insights into the use and consequences of university-level gender equality policies. Nevertheless, the study has some limitations. First, we observed correlations between university-wide policies and the total share of women professors. Because both career paths and hiring processes typically unfold at the faculty and department levels, our analysis is only able to pick up the aggregate pattern from multiple processes at lower institutional levels. Second, we studied whether a given university used a particular policy but did not measure the policy's scope and implementation in depth. A higher level of detail in the data could provide stronger associations between the measures and the outcomes, for instance, the use of measures and professorships at the faculty or department level. Third, it was difficult to collect data on policies that were no longer in place. In many cases, the universities had faced institutional changes and changes in personnel, often hampering the organizational memory (esp. in the case of mergers). Thus, for some cases, the start and end years of policies represented estimates rather than exact responses. Fourth, it should also be pointed out that the share of women professors is only one potential outcome of gender equality policies.

In consequence, the limitations imply that our results are a conservative measure of potential policy effects. Our study thus represents a point of departure for further investigation into policy effects about the implementation of gender equality at the faculty and departmental levels. Future research should investigate the co-dependence of the use of measures and whether their composition and effect depend on university profiles. Another avenue for future research is to investigate the differences in the introduction and efficacy of equality measures by country, as universities are likely to be influenced by differences in the feminist understandings of gender equality at the national level.

Notes

1. We have tried various lengths of lags. See Appendix A for results.
2. See Appendix A for regression without adjustment for women in lower-level academic staff categories.
3. See Appendix Tables A2 to A5 for regression tables.

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References

- Benschop, Yvonne, and Mieke Verloo. 2011. "Gender Change, Organizational Change, and Gender Equality Strategies." In *Handbook of Gender, Work, and Organization*, edited by Emma Jeanes, David Knights, and Patricia Yancey Martin, 277–90. Chichester, UK: Wiley.
- Bohnet, Iris. 2016. *What Works—Gender Equality by Design*. Cambridge, MA: Harvard University Press.
- Broadbridge, Adalina, and Jeff Hearn. 2008. "Gender and Management: New Directions in Research and Continuing Patterns in Practice." *British Journal of Management* 19 (1): 38–549. doi:10.1111/j.1467-8551.2008.00570.x
- Carlsson, M., H. Finseraas, A. H. Midtbøen, and G. L. Rafnsdóttir. 2021. "Gender Bias in Academic Recruitment? Evidence from a Survey Experiment in the Nordic Region." *European Sociological Review* 37 (3): 399–410. doi:10.1093/esr/jcaa050
- Chang, Edward H., Katherine L. Milkman, Dena M. Gromet, Robert W. Rebele, Cade Massey, Angela L. Duckworth, and Adam M. Grant. 2019. "The Mixed Effects of Online Diversity Training." *Proceedings of the National Academy of Sciences* 116 (16): 7778–83. doi:10.1073/pnas.1816076116
- Database for Statistics on Higher Education. 2017. <https://dbh.nsd.uib.no>.
- Devine, Patricia G., Patrick S. Forscher, Anthony J. Austin, and William T. L. Cox. 2012. "Long-Term Reduction in Implicit Race Bias: A Prejudice Habit-Breaking Intervention." *Journal of Experimental Social Psychology*, 48: 1267–78. doi:10.1016/j.jesp.2012.06.003
- Dobbin, Frank, and Alexandra Kalev. 2013. "The Origins and Effects of Corporate Diversity Programs." In *Oxford Handbook of Diversity and Work, Oxford Library of Psychology*, edited by Q. M. Roberson, 253–81. Oxford University Press.
- Dobbin, Frank, and Alexandra Kalev. 2018. "Why Doesn't Diversity Training Work? The Challenge for Industry and Academia." *Anthropology Now* 10 (2): 48–55. doi:10.1080/19428200.2018.1493182
- Dobbin, Frank, Daniel Schrage, and Alexandra Kalev. 2015. "Rage Against the Iron Cage: The Varied Effects of Bureaucratic Personnel Reforms on Diversity." *American Sociological Review* 80 (5): 1014–44. doi:10.1177/0003122415596416
- Forscher, Patrick S., Calvin K. Lai, Jordan R. Axt, Charles R. Ebersole, Michelle Herman, Patricia G. Devine, and Brian A. Nosek. 2019. "A Meta-Analysis of Procedures to Change Implicit Measures." *Journal of Personality and Social Psychology* 117 (3): 522–59. doi:10.1037/pspa0000160
- Gardiner, Maria, Marika Tiggemann, Hugh Kearns, and Kelly Marshall. 2007. "Show Me the Money! An Empirical Analysis of Mentoring Outcomes for Women in Academia." *Higher Education Research & Development* 26 (4): 425–42. doi:10.1080/07294360701658633

- Ginther, D. K., J. M. Currie, F. D. Blau, and R. T. Croson. 2020. "(May). "Can Mentoring Help Female Assistant Professors in Economics? An Evaluation by Randomized Trial." *AEA Papers and Proceedings* 110: 205–9. doi:[10.1257/pandp.20201121](https://doi.org/10.1257/pandp.20201121)
- Heikkilä, Mia, and Anneli Häyrén-Weineståhl. 2009. Kartläggning och analys av jämställdhetsinsatser vid svenska lärosäten 2000–2009. *Delegationen för jämställdhet i högskolan*, Report 2009: 1.
- Holzer, Harry J., and David Neumark. 2006. "Affirmative Action: What Do We Know?" *Journal of Policy Analysis and Management* 25 (2): 463–90. doi:[10.1002/pam.20181](https://doi.org/10.1002/pam.20181)
- Husu, Liisa. 2010. *Mot mer jämställda universitet: en internationell översikt över strategier och åtgärder*.
- Kaiser, Cheryl R., Brenda Major, Ines Jurcevic, Tessa L. Dover, Laura M. Brady, and Jenessa R. Shapiro. 2013. "Presumed Fair: Ironic Effects of Organizational Diversity Structures." *Journal of Personality and Social Psychology* 104 (3): 504–19. doi:[10.1037/a0030838](https://doi.org/10.1037/a0030838)
- Kalev, Alexandra, Frank Dobbin, and Erin Kelly. 2006. "Best Practices or Best Guesses? Assessing the Efficacy of Corporate Affirmative Action and Diversity Policies." *American Sociological Review* 71 (4): 589–617. doi:[10.1177/000312240607100404](https://doi.org/10.1177/000312240607100404)
- Kellough, J. Edward, and Katherine C. Naff. 2004. "Responding to a Wake-up Call: An Examination of Federal Agency Diversity Management Programs." *Administration & Society* 36 (1): 62–90. doi:[10.1177/0095399703257269](https://doi.org/10.1177/0095399703257269)
- Kulik, Carol T., and Loriann Roberson. 2008. "Common Goals and Golden Opportunities: Evaluations of Diversity Education in Academic and Organizational Settings." *Academy of Management Learning and Education* 7 (3): 309–31. doi:[10.5465/amle.2008.34251670](https://doi.org/10.5465/amle.2008.34251670)
- Naff, Katherine C., and J. Edward Kellough. 2003. "Ensuring Employment Equity: Are Federal Programs Making a Difference?" *International Journal of Public Administration* 26 (12): 1307–36. doi:[10.1081/PAD-120024399](https://doi.org/10.1081/PAD-120024399)
- Nelson, L. K., and K. Zippel. 2021. "From Theory to Practice and Back: How the Concept of Implicit Bias was Implemented in Academe, and What This Means for Gender Theories of Organizational Change." *Gender & Society* 35 (3): 330–57. doi:[10.1177/08912432211000335](https://doi.org/10.1177/08912432211000335)
- Nielsen, Mathias Wullum. 2017. "Scandinavian Approaches to Gender Equality in Academia: A Comparative Study." *Scandinavian Journal of Educational Research* 61 (3): 295–318. doi:[10.1080/00313831.2016.1147066](https://doi.org/10.1080/00313831.2016.1147066)
- Paluck, Elizabeth L., and Donald P. Green. 2009. "Prejudice Reduction: What Works? A Critical Look at Evidence from the Field and the Laboratory." *Annual Review of Psychology* 60: 339–67. doi:[10.1146/annurev.psych.60.110707.163607](https://doi.org/10.1146/annurev.psych.60.110707.163607)
- Pietilä, Maria, and Romulo Pinheiro. 2021. "Reaching for Different Ends Through Tenure Track—Institutional Logics in University Career Systems." *Higher Education* 81 (6): 1197–213. doi:[10.1007/s10734-020-00606-2](https://doi.org/10.1007/s10734-020-00606-2)
- Pitts, David W. 2007. "Implementation of Diversity Management Programs in Public Organizations: Lessons from Policy Implementation Research." *International Journal of Public Administration* 30 (12-14): 1573–90. doi:[10.1080/01900690701230192](https://doi.org/10.1080/01900690701230192)
- Ragins, Belle Rose, and Eric Sundstrom. 1989. "Gender and Power in Organizations: A Longitudinal Perspective." *Psychological Bulletin* 105 (1): 51–88. doi:[10.1037/0033-2909.105.1.51](https://doi.org/10.1037/0033-2909.105.1.51)
- Reisel, Liza. 2015. "The Meaning of Ethnic Equality in Scandinavian Anti-Discrimination Legislation." *Nordic Journal of Migration Research* 5 (1): 19–27. doi:[10.2478/njmr-2014-0023](https://doi.org/10.2478/njmr-2014-0023)
- Roos, Hannelore, J. L. J. Mampaey, Jeroen Huisman, and Joost Luyckx. 2020. "The Failure of Gender Equality Initiatives in Academia: Exploring Defensive Institutional Work in Flemish Universities." *Gender & Society* 34 (3): 467–95. doi:[10.1177/0891243220914521](https://doi.org/10.1177/0891243220914521)
- Silander, C., I. Drange, M. Pietilä, and L. Reisel. 2022. "Promoting Gender Equality in STEM-Oriented Universities: Institutional Policy Measures in Sweden, Finland and Norway." In *Gender Inequalities in Tech-Driven Research and Innovation: Living the Contradiction*, edited by G. Griffin, 93–108. Bristol: Bristol University Press.
- Squires, Judith. 2008. *Gender in Political Theory*. Cambridge: Polity Press.
- Statistics Sweden. 2021. www.scb.se.
- Timmers, Tanya M., Tineke M. Willemsen, and Kea G. Tijdens. 2010. "Gender Diversity Policies in Universities: A Multi-Perspective Framework of Policy Measures." *Higher Education* 59 (6): 719–35. doi:[10.1007/s10734-009-9276-z](https://doi.org/10.1007/s10734-009-9276-z)
- Vipunen Database Education Statistics Finland. 2018. www.vipunen.fi.
- Weick, Karl E. 1976. "Educational Organizations as Loosely Coupled Systems." *Administrative Science Quarterly* 21 (1): 1–19. doi:[10.2307/2391875](https://doi.org/10.2307/2391875)
- Williams, Christine L., Kristine Kilanski, and Chandra Muller. 2014. "Corporate Diversity Programs and Gender Inequality in the Oil and Gas Industry." *Work and Occupations* 41 (4): 440–76. doi:[10.1177/0730888414539172](https://doi.org/10.1177/0730888414539172)