Women in power: Sex differences in Swedish local elite networks

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Abstract
Women occupy a small minority of elite positions in contemporary society. In addition, the minority of women who gain access to influential elite positions are often assumed to have their actual influence circumscribed by mechanisms of marginalization. However, systematic evidence to support the latter view is relatively scarce. We apply social network analysis to study sex differences in local elite networks in Sweden, and show empirically that, despite the fact that women are the minority group across all elite dimensions, female elites uphold the same 'structural status' as male elites.

Keywords
local elites, sex differences, social networks

Introduction

Academic interest in the potential conflict between democratic governance and a division of labour in society that concentrates decision-making on a small group of individuals, an elite, goes back at least to the early 1900s (see Engelstad (2006) for a brief introduction). As we are reminded on an almost daily basis, the tension between the elite that governs and the mass that is governed remains a key challenge to modern democratic society. A key assumption in both popular and academic debate is that there is no way society can do without elites, and that consequently it matters who is in the elite and how the elite operates internally. If democratic society has to rely on elite governance, then these elites should be

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representative of the broader interests and be operating in an accountable fashion. In Mills's (1956) classic account of the power elite in the USA, the norm for an elite actor was to be white, middle to upper class, and male. This would certainly hold true also in post-colonial Europe up until (possibly) very recently, and from the perspective of representative and democratic ideals, both within and outside the political sphere, it would constitute an equally distressing finding. This would explain why more recent studies of elites have been concerned specifically with the diversity of elites (e.g. Vianello and Moore, 2004; Zweigenhaft and Domhoff, 2006). In the Scandinavian context, the focus on women in power has been particularly noticeable, going back at least to the huge expansion of the female labour force in the 1970s and the demands for gender equality that followed.

Even if some would argue that women's entry into the corridors of corporate and political power has been too slow, it cannot be denied that the change has been fairly dramatic. So dramatic in fact that one might fear the inflow of women into elite positions is simply a concession to popular demands, and that women end up more as tokens and figureheads than as equals in the elite (see, e.g., Bohman et al., 2012; Dahlerup, 2006). If so, an increase in numbers will not be accompanied by the expected empowerment. In this article, we study the differences between local elites in contemporary Sweden, asking whether men and women hold network positions with equal power potential. Sweden, or any of the other Nordic countries for that matter, is interesting because there is strong popular support for, and a long tradition of, gender equalizing reforms. It seems that better conditions for observing a truly equal playing field for male and female elites would be hard to find.

Theory: Local elites and power through networks

In this article, we loosely define elites as a powerful minority that has a disproportionately large influence on social, economic and political life. We are specifically concerned with so-called local elites, that is, people who make decisions in local governments and local business that have direct and indirect consequences for the people living within their jurisdiction or sphere of influence.[1]

We are interested in the distribution of power within elites, and the research question is whether female elite actors systematically have less power than male actors. Power, of course, is a contested concept (Lukes, 1974) and there are several ways of conceiving of power and power inequalities. First, it should be noted that power in elites not only entails direct influence over formal decision-making (Dahl, 1961), but also the ability to influence agenda-setting (Bachrach and Baratz, 1962), including blocking issues reaching formal decision-making institutions (Lukes, 1974). Second, and related, we need to distinguish between formal and informal power. A person's formal power derives from his or her position in a hierarchical structure (e.g. CEO, party leader) and the legitimate authority and jurisdiction that come from this position (e.g. Bass, 1960). The distribution of formal power is thus determined by the magnitude and range of the legitimate authority stipulated by the position. In this way, a CEO has more formal power than the middle management, and a party leader has more formal power than a party secretary. Formal power, however, only explains part of what is going on in decision-making: many decisions are made via, or are at least influenced by, informal consultations that take place outside formal meetings, either in work-related conversations or in the course of informal social life (e.g. Boulding, 1989; French and Raven, 1959). Individuals who are well placed in informal networks may thus exert a substantial influence over decisions of vital importance, even if they should lack formal positions of power (e.g. Knoke, 1990). This contrast between formal (prescribed) and informal (emergent) carries over to networks (Ibarra, 1993: 58), and in this article we distinguish between two types of informal networks that are structured around either work-related relations or private, non-work-related relations. The rationale for this is that there are good reasons for assuming that not only is informal power exerted in the meeting rooms and corridors of formal organizations and institutions, but is extended to the golf clubs and dining rooms and other contexts in which elites meet privately (e.g. Domhoff, 1967). Previous research has also found interesting differences between women and men with respect to work-related (instrumental) and private (expressive) network relationships (Ibarra, 1992).

For good reasons we may assume that there is a considerable overlap between formal power and informal power (that is, those who are highly placed in the hierarchical structure also have central positions in informal networks), but the overlap is likely to be far from perfect. How large or small it is is ultimately an empirical question. In this article, however, the key focus is on informal power distribution for male and female elite actors measured as work-related and private (non-work related) networks.

From a social network perspective, informal power can be studied from several angles. First, one measure of prominence is network centrality, and it makes good sense to assume that the person who is most centrally located in a social network also has the greatest potential to exercise informal power. Centrality in itself, however, is a non-trivial concept (Freeman, 1979) and there are several conceptions and measures of centrality that focus on different aspects. The two most straightforward assumptions are that the more social connections a person has the more central she is (*degree centrality*), and that the shorter distance a person has to everyone else in the network the more central she is (*closeness centrality*).

Yet, however useful these conceptions and measures of centrality are, they miss the importance of indirect relations. Not only how many relations an actor has herself, but the number of contacts that can be reached indirectly through alters, is of importance for capturing informal power within social networks. In order to account for both direct and indirect ties we also measure the number of contacts-of-a-contact by means of *eigenvector centrality* (as described in the Methods section below).

One additional facet of informal power within social networks is the ability to exploit structural holes by bridging cliques within the structure. For Burt (1992), a structural hole is a concept for the separation between non-redundant contacts. Redundant contacts, in turn, are contacts that lead to the same actors, that is, a clique of actors that are well integrated with one another. Actors in a position to exploit structural holes, by bridging such cliques, are assumed to benefit from information benefits. Similarly, actors whose networks lack structural holes are structurally constrained in terms of potential bridging. As further discussed below, we use the measure of *aggregate constraint* to study the opportunity to exploit structural holes.

In a related way, the ability for elite actors to reach out to actors within other elite spheres is a potential source of informal power. To be tied to other elite spheres through social network relations would potentially give important information benefits. For that reason we measure the heterogeneity of each actor's social networks in terms of elite sphere belonging (i.e. politician, business, administration or other). In addition to the fact that access to different spheres in itself can increase the power potential of an elite actor, the ability to act as a broker between spheres should be particularly beneficial. We study elite sphere brokerage, that is, whether the elite actor holds a network position that provides the potential to bridge different spheres. Gould and Fernandez (1989) distinguish between *representative* brokers and *liaison* brokerage. The former is the ability to exert control and influence by mediating between in-group and out-groups (i.e. when a politician indirectly links politicians who lack direct contacts to business representatives), while the latter is an intermediary between actors belonging to two different out-groups (i.e. when a politician links actors from business and public administration that lack direct ties to one another). In general, we would expect that women, being part of the 'new' and minor population, are less centrally positioned and less likely to be brokers than men. Previous research also indicates that men are considerably more likely to broker between different elite spheres (i.e. between the political and the economic sphere) than are women (Moore and White, 2000; Palgi and Moore, 2004).

The ideas about centrality, elite sphere heterogeneity and brokerage are clearly connected to the study of informal power potentials in an elite network, and there are good reasons for believing that they are essential indicators of sex differences in the distribution of informal power. However, one can envision an elite structure in which men and women would have equal access to potentially powerful positions but in which the network is completely partitioned into one male and one female part. Such compartmentalization would not only be problematic from a democratic point of view, it would also suggest systematic (power) segregation within the elite. Sex homophily, i.e. the tendency for men to interact with men and women to interact with women, is therefore an additional potentially important dimension of the elite

structure. Homophily in social networks is a recurrent phenomenon also outside elite circles which has been observed in a large number of studies (see McPherson et al., 2001), and sex-based homophily in elite networks has been suggested as a possible explanation for why women tend to be excluded from powerful positions (Niklasson, 2007): male-dominated social networks are reproduced because men in power positions prefer to interact with other men. We would expect that, once in the elite, women would have a weaker tendency towards homophily than men, for mainly three reasons. Firstly, given the gender imbalance in elites, there simply are more men around to bond with. Secondly, again because of gender imbalance, it is likely that recruitment into the elite is done by high-status men. Assuming that men and women have the same preference for status, this would imply that both men and women connect with (high-status) men. Thirdly, previous research on managerial networks suggests that men and women have different strategies when choosing network partners, with women having more diverse and men more homophilous networks (Ibarra, 1992, 1993).

From the discussion above it follows that sex differences in power distribution within local elites cannot be studied simply by counting seats. Even an equal proportion of female and male actors can potentially conceal huge power inequalities if male actors systematically occupy more influential positions. To achieve a full picture of sex differences in power distribution in local elites we also need to take informal power into account, and one effective way of doing so is to use social network analysis. The empirical analyses below specifically focus on the following four hypotheses:

H1: Female elite actors are less centrally placed than men.

H2: Female elite actors are less likely to exploit structural holes.

H3: Female elite actors have fewer heterogeneous networks regarding elite spheres, and are less likely to broker between different elite spheres.

H4: Women have less sex homophily in their relations than do men.

Context

Sex differences in Swedish elites

Sweden is one of the most egalitarian countries in the world – also when it comes to equality between the sexes (Inglehart and Norris, 2003; United Nations Development Programme, 2005). Some important reasons for Sweden's high level of gender equality have been high labour market participation among women, comparatively small income differences between the sexes and 'women-friendly' welfare policies (Blau and Kahn, 2003; Jaumotte, 2003). In fact, even by Scandinavian standards, Sweden has a high level of female representation among the elite (Roustetsaari, 2007). However, sex-based differences do exist in Sweden and they are most striking at the top layers of society. Figure 1 shows that female representation in the Swedish parliament, which is high above the Western European average (Wide, 2006), is fairly well balanced between the sexes (SOU, 2007: 108). For comparison, a similarly positive trend is present among university professors, director generals, board directors on publicly traded companies, and executive officers, even though not yet at the same level. Female representation among chief executive officers (CEOs) is still conspicuously low (Figure 1) (Bohman et al., 2012), indicating the fact that the proportion of women is lowest in the economic elite (SOU, 2007: 108; Yaish and Stier, 2009).

Turning to specific studies of sex imbalances among the national elites in Sweden (Freidenvall et al., 2006; SOU, 2007: 108), the general picture is that men are overrepresented among most elite strata and within most spheres of influence (Göransson, 2007; SOU, 1998: 6 and 2007: 108). However, the overrepresentation of men does not capture the full complexity of gender relations among Swedish national elites. For instance, when Göransson (2007) compares career paths and subjective career experiences of men and women in her ambitious survey of national elites, more similarities than dissimilarities emerge. In some instances, the female elite actors even seem to advance their careers faster than male elite actors do (ibid.). And women elites also seem to benefit from strategically placed personal allies to the same
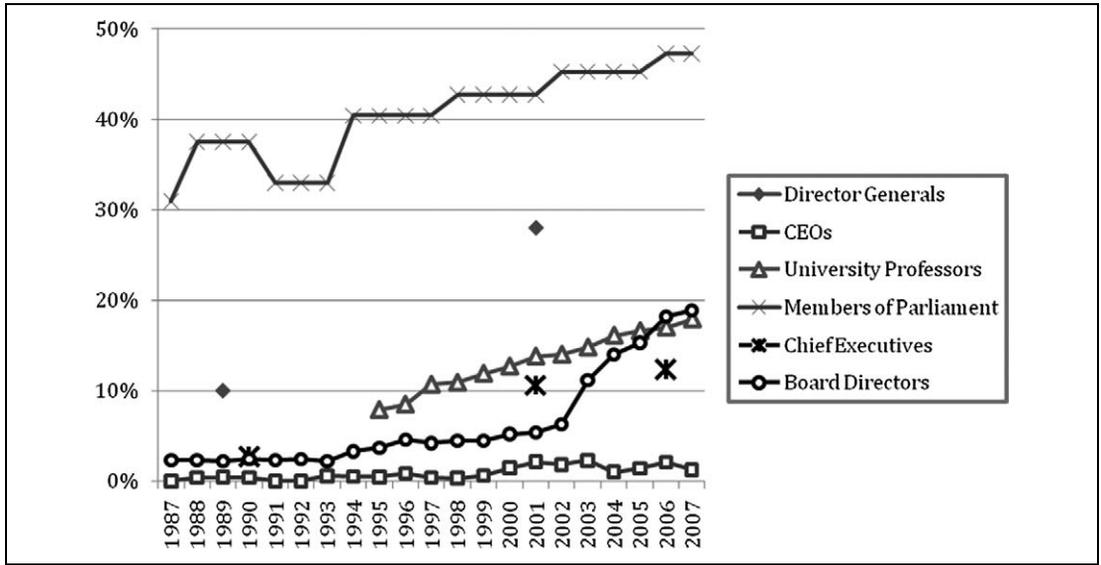
Figure 1. The share of women in some influential positions in Swedish society (Bohman et al., 2012)
The three private sector percentages (chief exec., CEOs, boards) pertain to firms trading on the Stock-holm stock exchange.
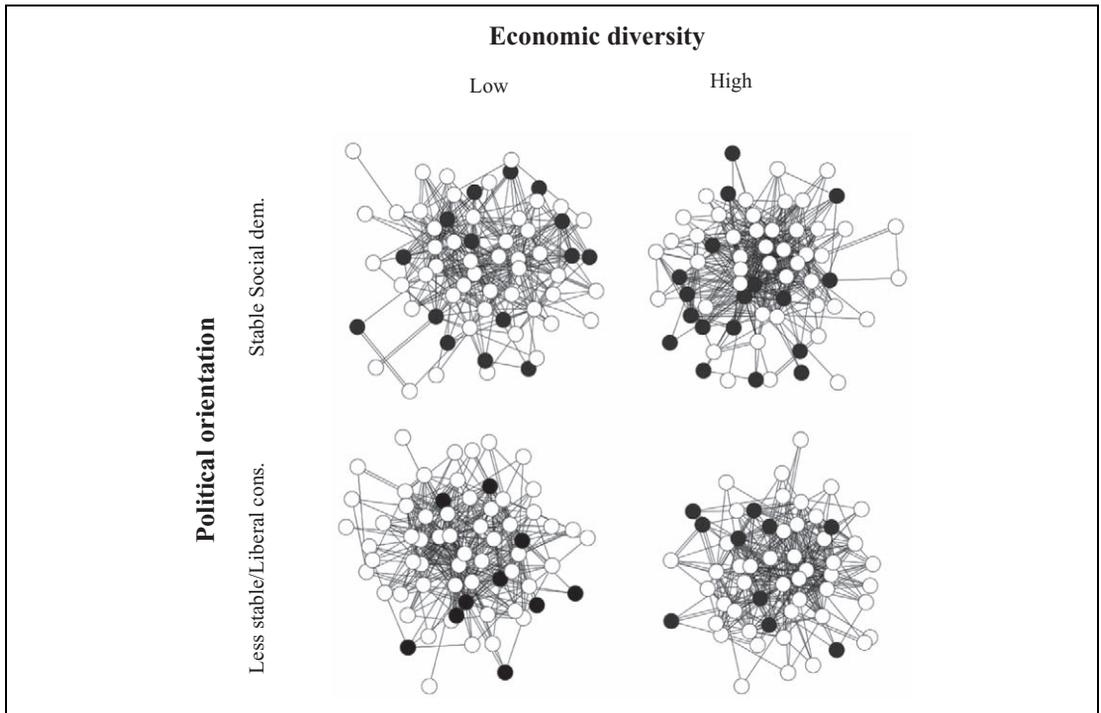
Figure 2. Work-related networks of local elites in four Swedish municipalities
Nodes represent individual actors and are plotted according to centrality. White nodes represent male and black nodes female actors. Networks rendered in Visone (Baur 2008).

extent as their male counterparts (Jordansson, 2006), a finding that leads us to the role of personal networks. We know from earlier studies that female national elite actors in Sweden say they have good access to informal personal networks, a finding that sets Sweden apart from other countries (Göransson, 2007). Swedish female elites report a higher number of 'important network contacts' than males do, and few differences are found when the elites are asked about the intensity and importance of their connections with other elite actors within and outside their own fields of activity (Djerf-Pierre, 2007a). Besides the important numerical disparity, the significant difference between male and female elite actors found in earlier research is that female elite actors tend to take on more household responsibilities and have few children (Djerf-Pierre, 2007b), which clearly indicates that women in elite positions have a hard time striking a balance between professional and private life.

Whether this relatively positive image of female representation in Sweden translates into genuine political influence is a contested issue (Wägnerud, 2009). Regional and local party organizations are, for instance, strongly dominated by men (SOU, 2007: 108), and despite the fact that female representation in municipal political assemblies in Sweden has grown steadily from about 10 per cent in the late 1950s to 42 per cent after the 2006 general elections (Szücs and Strömberg, 2009; Wide, 2006), men still occupy up to three-quarters of the top positions (SOU, 2007: 108). Furthermore, some scholars claim that informal patriarchal structures still persist at the local level and that a growing numerical representation of women does not necessarily translate into growing political influence (Nilsson, 2008). Looking at local and national civil service and government administration we find a similar pattern. Although around 40 per cent of high-ranking administrative officials and decision-makers at the national level are women, only one-quarter of such positions at the municipal level are held by women (SOU, 2007: 108).

Political decision-making in Sweden

Political decision-making in Sweden is carried out at three levels: the national, the regional and the local. The supreme political decision-making body is the national parliament, while the regional level comprises 20 county councils.[2] Local political power lies with 290 municipal assemblies. The roles and responsibilities ascribed to subnational levels of government are regulated through the Local Government Act,[3] according to which the main task of county councils is to provide healthcare, while municipal authorities are basically responsible for all other matters relating to their inhabitants and their immediate environment. This means, for instance, that Swedish municipalities are legally or contractually responsible for the provision of all social services, child and elderly care, as well as primary and secondary education. On a more or less voluntary basis they are, furthermore, responsible for providing housing, industrial and commercial services and leisure activities for their populations. Since each level of political decision-making has distinct areas of responsibilities and far-reaching self-governing rights, no obvious hierarchical relationship exists between them. The local level of political decision-making is thus vitally important.

Sweden's 290 municipalities vary in size between small, rural units with fewer than 3,000 inhabitants and metropolitan areas like the city of Stockholm (800,000). Regardless of their size, municipalities are economically important actors in Sweden. Some 760,000 people are in their employ, which makes municipalities one of the largest and most significant categories of employers in the country. Close to one-fourth of Sweden's GDP consists of municipal expenditure, and tax-financed public services are mainly produced and supplied by municipalities.

The municipality's most important political privilege is in levying taxes. This implies that Swedish municipal authorities are highly important economic actors with great relevance to local business communities. This is, first of all, because of the numerous strong economic links that intertwine local business communities with municipal government. In some areas, for instance, the provision of various public services offered by the municipality is outsourced to private companies, effectively turning municipal authorities into important sources of income for local business. In other areas, private business is often in direct competition with municipally-owned service providers, offering equal or similar

services to the public. Secondly, municipal administrations and private business interests often collaborate intensively on local and regional development projects. Representatives of business communities usually partner local government through different forums of collaboration. Hereby, the broad outlines of community development are usually established through and accompanied by reasonably deep mutual understanding between political, administrative and economic actors. Finally, in times of severe economic hardship, for instance during economic crises and periods of major structural transformation, the institutional framework of municipal government acts as lender of last resort of social responsibility, as well as intermediary between the acute needs of local businesses and national government agencies. In such times, local business relies heavily on the municipal administration's willingness and ability to assist, for instance through mitigating the impact of massive lay-offs.

Data and methods

Sampling procedure

We collected social network data on local elites in four mid-sized municipalities located in the Swedish region of Västra Götaland. We confined the study to one particular region in order to hold constant some possible between-regional differences. The municipalities were chosen in order to vary along two dimensions: their political history and the current structure of their economies. On the first dimension, we wanted municipalities with a history of Social Democratic dominance and those whose political history was characterized by frequent shifts in power or conservative liberal rule. On the second dimension, we wanted municipalities that had a diversified local business and those that were dominated by one or a few big economic actors. Strictly speaking this is not a representative sample of Swedish municipalities, but we have no reason to believe that it is so specific as to deny some fairly general conclusions about conditions in Sweden. Municipality 1 in our sample has a strong history of conservative political rule and a local economy strongly dominated by one large industrial employer in the private sector. Municipalities 2 and 3 are both traditional social democratic strongholds. But while the former's economic life is heavily centred on the activities within one large industrial conglomerate located there, municipality 3 has a much more diverse economic base. Finally, municipality 4 is characterized by relatively frequent shifts of political power and a highly diverse local economic base.

The decision-makers of the local elite are chiefly to be found in three different spheres: The Political, the Business and the Civil Servant sphere. Politicians are nominated and elected into office in local elections every fourth year. Some politicians are active at national level in the Swedish parliament and are a particularly important link between local interest and the highest political power. The business elite is largely self-nominated at the local level, but important networking and lobbying take place in regional chapters of the Swedish Federation of Business Owners and Chambers of Commerce. Civil servants are professionals who handle and execute political decisions. Consequently, civil servants work closely with both politicians and business representatives. Given the central role that members of these spheres play in the local power-game, we believe that this is the first place to look for systematic sex differences.

The elite in each municipality was defined and identified according to a multi-step strategy. To define the network boundary,[4] we gathered background information from webpages, local newspapers and official minutes and proceedings. For the first step we looked at formal positions in order to identify the potentially most influential actors in each municipality, and included in the sample all prominent local politicians, business representatives, civil servants and representatives of other organizations (e.g. museums, sports associations, trade unions, healthcare institutions, etc.). For the politicians and civil servants, we selected on the basis of their formal position in the organizational hierarchies of local government and administration, and important seats in the elected local political assemblies. For the business sector we selected on the basis of size, thinking that the larger the role a company plays in the local labour market, the more important its influence on local politics and economy. In addition, we included elites that are not affiliated with the three core spheres, and here selection methods were

less straightforward; if the municipality had an important sports association, we selected its Chairperson; if the municipality had a strong church presence, we selected the Vicar(s); if there was a large NGO in the municipality, we selected its Executive Director; if the municipality had 'old' nobility, we selected its Lord. In a second step we validated this positional sample (Higley et al., 1991; Knoke and Yang, 2008; Scott, 2000) with local journalists and other experts on local affairs in the four municipalities that were not in the sample. These interviews led to minor modifications, and approximately 3 per cent of the actors were added or removed on the basis of these discussions. Sampling elite groups has its particular challenges, but this combination of positional and reputational sampling is in line with previous studies of elites (Alba and Moore, 1978; Higley et al., 1979; Higley and Moore, 1981; Moore, 1979). We saw no easy way to work around the slight reputational element that was in this way incorporated into our overall sampling strategy. By this method we identified a sample of in total 298 elite actors in the four municipalities taken together. Each of them was contacted by mail and telephone. In late 2007 and early 2008, we completed interviews with 248 persons (min 57 and max 65 respondents per municipality), which corresponds to a response rate of 83 per cent.

Network data collection

Approximately 60 per cent of the interviews were conducted in person, in the respondent's office, while the remaining interviews were done over the telephone. The length of the interview varied between 30 and 90 minutes, and questions were heavily focused on the respondent's social networks. Data under analysis in this article were collected using the same structured interview guide in both the personal and telephone interviews.[5] We collected complete network data (e.g. Knoke and Yang, 2008) using a roster listing the names of all elite actors in each municipality, as defined by our sample. For the telephone interview, the respondent received the roster via email and was asked to keep it on screen during the interview. This worked out very well.

Earlier research on community elite networks (Laumann and Marsden, 1979; Laumann et al., 1977) found that elite networks tend to be centred around sets of separate issues that interest elites from different domains. This implies that elite figurations are likely to look very different depending on the specific issue they are centred upon, and that some issues are even likely to lead to fractions and cleavages within the elite networks. In order to deal with this dynamic feature of elite networks within a cross-sectional sample, we measured relations across four different 'foci'. First, we asked with whom of the following persons on a list of names the ego had discussed professional affairs over the past twelve months.[6] Second, we repeated this procedure but asked respondents to indicate with whom they had personal relations.[7] Third and fourth, we asked questions about two specific political cases, which were both of major importance for the local community; one having to do with political economy, the other with environmental issues. We asked with whom on the list of names the respondent had been in contact regarding these two specific issues.[8] Consequently, we collected information on four complete networks constituted by the same elite actors but by four different types of relations. Our analysis is concentrated on the two relations that capture general 'work–life' interaction, which we call professional, and 'private–life' interaction, which we call private.

Analysis strategy

By having each respondent nominate any of the elite actors listed on the roster, we collected directed network data, i.e. for each elite actor we can distinguish between the number of ingoing and outgoing nominations. However, it is not completely clear what the power relation between two actors is if there is only a one-directed relation between them, and moreover it is not intuitive to think about either professional or private interaction as one-directed. Therefore, we analyse only reciprocated ties, i.e. we reduce each network to include only those relations where A nominates B and B nominates A. Such reciprocal ties are likely to be much more important for the local elite power game. In technical terms,

we analyse a binary graph: In any of the networks (four municipalities by four relations) there is either a link between A and B (1) or there is no link between A and B (0). We have run all analyses also for directed networks, and the results are robust across such configurations. It should be noted in particular that there are no systematic differences between men and women when it comes to incoming and outgoing nominations in any of the networks.

Our strategy is to regress sex (man/woman) on a set of network indicators to identify statistically, and/or substantially, significant differences between men and women. We analyse the complete dataset collapsing data from all four municipalities. Thus, when we compare men and women we use egocentric network statistics compiled from the complete network data. Egocentric indicators try to capture the characteristics of a person's immediate personal network (see section on measures below).

Because the size and density of the network can influence egocentric measures there is a potential problem in comparing statistics that are sampled from different network structures. However, it is essential to note that the four networks are similar in size and density ($n=[57,65]$, $d=[0.22,0.25]$), so in this particular case it is not likely to be a critical problem. Moreover, systematic difference between municipalities was handled by controlling for municipality in the regression models. However, if there is a large difference in the variance of the egocentric measure across municipalities, the regression estimates are biased. Therefore we also normalized each indicator by network by subtracting the mean and dividing by the variance: $x(normalized, i)=[x(i,k)–x(mean, k)]/v(k)$. However, since the results do not differ between the normalized and non-normalized specifications, we present only the non-normalized models.[9]

As could be expected, and as will become evident, the local elite is dominated by men. This is not particularly surprising, but it has some important methodological implications for the analysis of homophily in terms of same-sex preference. The fact that there are more men than women in the elite will increase the likelihood that men interact with men rather than with women, and that women interact with men rather than with women by simple mathematics. Thus, it would hardly be surprising if we observed that men have a stronger preference for same-sex interaction than women. To remedy this, the empirically observed same-sex connections in our data are evaluated against graph statistics derived from a simulated distribution of random graphs (e.g. Bollobás, 2001; Wasserman and Robins, 2005). In any social network, we assume that there is a specific structure that emerges from the complex interaction between social actors, and which can explain how the connections are distributed between these actors. A random graph has no structure, but instead all the connections (edges) between actors (nodes) in such a graph are randomly distributed. We simulated 1000 graphs, with the same relevant properties as our observed networks. In this case we fixed the number of nodes and the density. If the observed number of same-sex connections deviate by more than 2 standard deviations from the mean number of corresponding connections found in the random graph distribution, this can be taken as an indicator of either the presence or the absence of sex-based homophily among the observed actors.

Measures and indicators

The network analytical toolbox provides a range of measures that can be used to analyse the potential power of a network actor (e.g. Knoke and Yang, 2008; Wasserman and Faust, 1994). We apply a handful of these that we claim capture the most pertinent power-related characteristics of a personal network and serve us well in testing our hypotheses: Centrality (degree, closeness, eigenvector), Brokerage, Constraint and the E–I index. These measures are explained and discussed in more detail in Table 1 and below.

Because it is reasonable to assume that elite power comes not only from network position but also from hierarchical position, we have an indicator to assess the formalized power emerging from hierarchical positions. This indicator is constructed according to fairly straightforward ideas about hierarchy using the information we collected in defining the sample and through the interviews. For instance, civil servants with considerable and overarching formal responsibilities are said to hold more formal power

Table 1. Network measures and their power dimension.

Measure	Intuition	Network power dimension
Degree	The number of alters that ego is connected to.	An actor that has many connections relative to others in the same community is more central and has the potential to influence others.
Closeness centrality	The distance between ego and all alters to which she is connected relative to the total number of alters. A value of 1 means ego is adjacent to all alters.	An actor that is a short distance from the other actors has a better over-view, can quickly access information and is also 'visible' to the other actors.
Eigenvector centrality	Eigenvector centrality differentiates between actors on the basis of how well connected their alters are. Being connected to a certain number of nodes with many connections results in a higher eigenvector centrality score than having an equal number of connections to nodes with fewer contacts.	High eigenvector centrality means that ego is well connected among those 'who count' within a network. Having direct access to structurally important nodes may obviously be associated with a range of power and influence related benefits.
Aggregate constraint	Aggregate constraint quantifies ego's ability to link otherwise disconnected parts of social structure.	Low aggregate constraint is associated with access to so-called structural holes. In most settings, the ability to span such social voids represents non-trivial entrepreneurial opportunities for ego.
Brokerage	If i is connected to j and j is connected to k, and i and k are not connected, then j is a broker between i and k. Actor j plays one of five different brokerage roles depending on the group affiliations of i, j and k.	A broker is a facilitator supplying access and/or trust between two other actors. Here we concentrate on the brokerage role of the representative/gatekeeper and the liaison. The representative/gatekeeper gains power through his intermediary position between others within the same sphere of activity (e.g. politics) and outsiders. The liaison benefits from being able to structurally bridge the gap and play a potentially mediating role between two outsiders (e.g. a civil servant mediating contact between a politician and a businessman).
E–I Index	The E–I Index relates the number of social connections that ego has to alters of the External group to the number of social connections ego has to alters of the Internal group. We use it for both sex (other sex/same sex) and sphere affiliation (other sphere/same sphere)	When connections tend to be internal (below 0 on the index) this is an indication of social homophily, i.e. that ego socializes with alters that are of the same category as ego.

Note: For methodological discussion, see Burt (1992), Freeman (1979), Gould and Fernandez (1989), Krackhardt and Stern (1988) and Wasserman and Faust (1994).

than civil servants with more specific and limited fields of responsibilities. According to a similar logic Chief Executive Officers of large companies with many employees are assumed to hold more influential positions than CEOs of smaller companies. For political actors those being chairmen of the local party branches were assumed to hold more power than other politicians, as were those occupying high status positions in the local decision-making institutions, such as the president of the city council. On the basis of this reasoning, we constructed a discrete variable ranging from 1 (minimal power) to 4 (maximal power) to estimate the hierarchical power of a position within a given sphere.

We use three centrality measures (see Freeman, 1979): Degree centrality is simply the number of connections that an actor has to other actors. We assume that the more connections one has, the higher the power potential. Closeness centrality captures the average network distance between an actor and everyone else in the network. We assume that the closer one is to others the higher the power potential. Eigenvector centrality considers the connectedness of each of the others that an actor is connected to. The assumption is that potential power increases the better connected one's connections are. The simple interpretation for all three centrality measures is that the higher the score, the higher the power potential. If we were to systematically observe that women receive lower scores than men on these measures, we would conclude that women have less networked power than men.

Constraint, or specifically aggregate constraint (Burt, 1992), captures the existence of so-called structural holes in an actor's personal network. Put simply, a structural hole exists whenever two of my friends are not themselves connected to each other. To have many structural holes in one's network is assumed to increase one's power potential by offering various middleman opportunities. This measure captures the constraints of the actor's network with respect to structural holes, and the higher the constraint the fewer the structural holes. Thus, if we observe that women have higher aggregate constraint than men, we would conclude that women have less power than men. We consider aggregate constraint in itself as an important indicator of network position, but it is admittedly very closely related to the idea of brokerage.

Brokerage, which is one of the oldest ideas in social network analysis, signifies an actor's ability to broker in a triad. Brokerage can occur when actor i is connected to both actor j and k, but when j and k are not connected to each other. We consider brokerage between spheres and distinguish between brokering to one or two spheres. In the first place, an elite actor brokers between an actor within her own sphere and an actor in any of the other spheres. In the second place, an elite actor brokers between two actors that belong to two different spheres, while the actor herself belongs to a third sphere. In the terminology of Gould and Fernandez (1989), the first category of brokerage refers to the representative and the gatekeeper, the second to the liaison. The assumption is that a brokerage position in and by itself offers great power potential.

The E–I index, where E stands for external and I for internal (Krackhardt and Stern, 1988), compares the number of connections that an actor has within her own group with the number of connections an actors has with other groups. We use it as an indicator of homophily to measure both same-sex preference and sphere homogeneity. In the first place, we simply compare the number of same-sex connections with the number of other sex connections. In the second place, we compare the number of within-sphere connections with the number of outside-sphere connections. The E–I index ranges from –1, when all connections are internal, to +1, when all connections are external. Thus, a score below 0 would be an indication of homophily.

In addition to the measures we have discussed, the multivariate analysis contains two additional (control) variables: age and university education (yes/no).

The sample

In each of the four municipalities we interviewed between 57 and 65 elite actors. Women make up 23 per cent of the elite actors across the whole sample. The majority of our respondents are politicians (34 per cent) and representatives of private companies (30 per cent). Civil servants make up 15 per cent of the sample and close to 5 per cent represent public sector companies. The remaining respondents belong to a heterogeneous selection of other locally important cultural institutions and civil society organizations. In terms of sex composition, the sphere of privately owned businesses is clearly skewed towards male domination (86 per cent men), municipally owned businesses on the other hand represent a fairly homogeneous domain (Kanter, 1977). However, even the elite spheres with the most equal sex composition are still far from being evenly distributed: 33 per cent of politicians and 27 per cent of civil servants are women, which means that no elite sphere in our sample is sex balanced. A majority have a higher

Table 2. Sex differences in estimated degree of power.

	Degree of power				Total %	*n*
	1 (min)	2	3	4 (max)		
Women	12	26	43	19	100	58
Men	19	22	31	28	100	190
Total	17	23	34	26	100	248

Note: $Chi^2(3)=4.99$, $p=0.172$.

education, and women tend to be better educated than men. In total, about 70 per cent of the women and 50 per cent of the men have a university degree. In the sphere of private business, 80 per cent of the women have a university degree compared to about 56 percent of the men. In the political sphere, 67 per cent of the women have a university degree compared to 29 per cent of the men. In the civil service sphere, around 80 per cent of both men and women have a university degree, which is not surprising given that this is a highly professionalized sector of society. The respondents' age varies between 27 and 73 years, with a mean of 54 years for both men and women.

Table 2 displays the percentage distribution of men and women across formal power, derived from hierarchical position as discussed above. As might have been expected from what we know from previous research, men are more likely to have the highest level of formal power. Here we find just short of 30 per cent of the men and about 20 per cent of the women. But there is no linear relationship between sex and formal power, and the overall impression is that male and female elites are fairly equally distributed across levels of formal power. At the second highest level, for instance, we find some 40 per cent of the women compared to about 30 per cent of the men. However, none of the differences in formal power between men and women are statistically significant. In the Results section we ask whether this tendency transfers to the various indicators that we have of centrality and brokerage (H1 and H2), and whether the composition of the male and female elites varies with respect to same sex and/or within sphere preference (H3 and H4).

Results

In this section we discuss the results produced using Ordinary Least Squares regression to regress the independent variable sex (0=male, 1=female) on a range of dependent variables capturing the network dimensions discussed above, controlling for age, education, formal power and municipality. We have run the analyses with other multivariate model specifications, but have found that they all produce the same result. In addition, we discuss results from a random graph simulation of same-sex preference.

Descriptive statistics are given in Table 3, and already here it is clear that there are few apparent differences between men and women. We note, first, that mean differences are small for most network dimensions and for all four types of relations. It is also worth noting that there is huge variation within all dimensions, which is the reason none of the mean differences between men and women displayed in Table 3 is statistically significant. Substantially, this means that there is a large power inequality among both men and women in the power elite, where some tend to have very good network positions while others are less blessed. At the same time there is noteworthy similarity between men's and women's network positions.

Note in Table 3 the substantial difference in degree between the professional and the other three networks. In the first network, mean degree is about 15, whereas in the other three degree is somewhere between 1.5 and 3 on average. It is worth keeping in mind that this difference feeds into some of the other measures that we use. For instance, with few connections one automatically has limited opportunities for brokerage. And with few connections there is no chance that my personal network will have

Table 3. Descriptive statistics across four types of relationship, Mean and (SD) unstandardized scores.

		Professional	Private	Economic case	Environmental case
Degree	Women	15.36 (9.67)	2.50 (2.92)	2.64 (3.47)	1.67 (2.35)
	Men	14.51 (11.33)	2.70 (3.08)	2.75 (3.95)	1.64 (3.03)
	Total	14.71 (10.95)	2.65 (3.04)	2.73 (3.83)	1.65 (2.88)
Closeness centrality	Women	0.50 (0.13)	0.15 (0.12)	0.15 (0.12)	0.11 (0.12)
	Men	0.49 (0.16)	0.16 (0.12)	0.13 (0.13)	0.09 (0.12)
	Total	0.49 (0.15)	0.16 (0.12)	0.14 (0.13)	0.10 (0.12)
Eigenvector centrality	Women	0.11 (0.07)	0.06 (0.09)	0.07 (0.09)	0.07 (0.09)
	Men	0.10 (0.07)	0.08 (0.10)	0.08 (0.11)	0.07 (0.11)
	Total	0.10 (0.07)	0.08 (0.10)	0.07 (0.10)	0.07 (0.11)
Aggregate constraint	Women	0.23 (0.24)	0.70 (0.33)	0.69 (0.32)	0.78 (0.29)
	Men	0.27 (0.28)	0.68 (0.34)	0.73 (0.34)	0.83 (0.29)
	Total	0.26 (0.27)	0.69 (0.33)	0.72 (0.33)	0.82 (0.29)
Representative/Gatekeeper positions	Women	33.41 (53.55)	1.95 (4.57)	2.36 (9.17)	0.76 (2.92)
	Men	38.20 (68.31)	2.05 (5.08)	2.91 (7.56)	1.57 (8.32)
	Total	37.08 (65.09)	2.03 (4.96)	2.78 (7.95)	1.38 (7.42)
Liaison positions	Women	31.52 (64.57)	2.34 (8.80)	1.79 (6.40)	0.34 (1.13)
	Men	44.21 (100.52)	3.08 (8.20)	2.71 (12.57)	1.34 (9.12)
	Total	41.24 (93.40)	2.91 (8.33)	2.49 (11.42)	1.10 (8.00)
E-Index for sphere-based homophily	Women	0.02 (0.57)	0.003 (0.82)	−0.01 (0.89)	−0.21 (0.78)
	Men	0.22 (0.50)	0.277 (0.73)	0.12 (0.80)	0.03 (0.84)
	Total	0.17 (0.52)	0.21 (0.76)	0.09 (0.82)	−0.04 (0.83)
E-Index for sex-based homophily	Women	0.51 (0.24)	0.37 (0.65)	0.45 (0.60)	0.71 (0.42)
	Men	−0.57 (0.29)	−0.57 (0.60)	−0.65 (0.41)	−0.58 (0.56)
	Total	−0.32 (0.54)	−0.34 (0.73)	−0.35 (0.68)	−0.22 (0.78)

many structural holes, i.e. with low degree aggregate constraint will be high almost by definition. Welch's t-tests confirm that not one of the mean differences between men and women in Table 3 is statistically significant.

Table 4 gives the result from the OLS regression models of sex on the set of network dimensions. We only display the unstandardized coefficient for the independent variable (sex) on the dependent variables. All models include control for age, education, sphere, formal power and municipality.[10] Overall, the explained variance in these models ranges from 0.4 to 73.5 per cent, with a model average of 6.6 per cent.[11] The general trend is that models of network position in work-related networks (professional, and the two case networks) have significantly better predictive power than the models of private network ties. In terms of statistically significant parameters, age and municipality are the most robust predictors.

Table 4 gives the regression coefficient for sex on each of the key dependent variables that we test. Each row in Table 4 gives the parameter estimates for sex, regressed on the dependent variable named in the left-hand column, across the four networks (columns 1–4), with all other variables held constant.

With one exception (see below), all sex differences reported in Table 4 are statistically insignificant, and this is indeed the important key finding. Because the standard errors are large overall, even with a significantly larger sample (say three times as large as the present) we would not find statistically significant differences. However, since most differences reported in Table 4 are consistently to women's disadvantage, with a direction in line with the hypotheses, we briefly discuss the results for each hypothesis below.

Hypothesis 1 states that women are less centrally placed than men. We assess this hypothesis through the degree, closeness and eigenvector centrality measures, rows a, b and c in Table 4. For each of the work-related networks – professional, economic and environmental – we can see that women have lower centrality than men, as indicated by the negative sign of the b-coefficients for all measures in columns 1,

Table 4. Sex differences across four network dimensions, unstandardized scores. Unstandardized regression coefficients and standard errors net of control variables.

Network dimension	Professional		Private		Economic case		Environmental case	
	b	SE	b	SE	b	SE	b	SE
a. Degree	−0.994	1.422	0.224	0.491	−0.575	0.546	−0.473	0.423
b. Closeness centrality	−0.006	0.023	0.006	0.018	−0.002	0.018	−0.001	0.014
c. Eigenvector centrality	−0.006	0.009	−0.002	0.016	−0.021	0.015	−0.018	0.016
d. Aggregate constraint	−0.006	0.041	−0.026	0.055	0.016	0.047	0.005	0.042
e. Representative/Gatekeeper positions	−10.672	9.369	0.764	0.791	−0.823	1.244	−1.625	1.216
f. Liaison positions	−15.321	13.667	0.139	1.338	−1.033	1.819	−1.735	1.317
g. E-Index for sphere based homophily	−0.062	0.063	−0.156	0.126	−0.049	0.142	−0.068	0.131
h. E-Index for sex based homophily	1.039	0.047	0.927	0.114	1.108	0.087	1.252	0.121

N's for a to c are 240, N's for g and h are 226 (Professional), 173 (Private), 137 (Economic) and 114 (Environmental)

3 and 4. Interestingly enough, as indicated by the positive b-coefficients in Table 4, rows a and b; in the private network (column 2), i.e. interaction in private life, women are more central than men both in terms of the number of contacts they have (degree) and in the distance to other actors (closeness). Thus women's and men's positions in the private network differ systematically from their positions in the work-related networks. Not one of these differences is statistically significant.

Hypothesis 2 states that women are less likely to exploit structural holes than men. We test this hypothesis with the aggregate constraints measure (Table 4, row d). Starting with the direction of the relationship, this hypothesis is weakly supported for the case-networks (columns 3 and 4), suggesting that women tend to have higher aggregate constraints than men. The opposite holds true for the professional and private networks, where women rather tend to be in a position to span otherwise disconnected parts of the network and men are embedded in networks with overlapping connections. However, we note once more that none of these differences is statistically significant.

Hypothesis 3 proposes that women have fewer heterogeneous networks with regard to sphere composition, and that women are less likely than men to broker between different elite spheres. We apply two measures to test this hypothesis. First, we test whether women have fewer brokerage positions than men, distinguishing between brokering from one's own sphere to another and brokering between two different spheres. Second, with the E–I index we test whether women have a lower proportion of external sphere connections compared to internal sphere connections than do men. We have seen already when comparing the means in Table 3 that on average women tend to hold fewer brokerage positions than men, and this holds true in the regression analysis in Table 4. As the negative sign of the coefficients for the work-related networks (columns 1, 3 and 4) in row e shows, women are consistently less likely to broker between their own sphere and members of another sphere than are men. For the private network (column 2) the opposite holds true. Here a woman is more likely than a man to be the one who connects her own sphere to members of another sphere. We find the same pattern for the second type of brokerage, namely that between two spheres different from one's own (row f). However, once again we see that not one of the differences is statistically significant. We also test hypothesis 3 with the E–I index for spheres. The direction of this relationship is in line with the hypothesis that women's networks are more homogenous than men's, i.e. women tend to have more of their contacts within the same sphere as themselves, whereas men tend to have connections that cross over into other spheres. These differences are statistically non-significant.

Hypothesis 4 states that women have less sex-based homophily in their connections than men do. We test this with the E–I index for sex in Table 4 (row h) and with a random graph simulation reported in Table 5. The E–I index gives a clear indication that, compared to men, women have a strong overrepresentation of male contacts. This is in fact also the one result in Table 4 that is statistically significant.

Table 5. Observed and random graph values over same sex ties in professional and private network relations.

Network structure	Municipality	Density	No. of actors	Type of ties	No. of ties	N	Min	Max	Mean	SD	z-score
Professional	1	0.22	57	Woman >> Woman	9	1000	1	22	9.74	2.76	−0.27
				Man >> Man	236	1000	207	258	235.91	7.89	0.01
	2	0.25	63	Woman >> Woman	28	1000	12	40	26.12	4.41	0.43
				Man >> Man	278	1000	247	315	277.80	9.57	0.02
	3	0.24	63	Woman >> Woman	41	1000	18	53	37.27	5.21	0.72
				Man >> Man	253	1000	209	267	239.95	9.40	1.39
	4	0.25	65	Woman >> Woman	38	1000	13	39	25.96	4.23	2.85
				Man >> Man	282	1000	271	336	304.43	9.65	−2.33
Private	1	0.04	57	Woman >> Woman	3	1000	0	8	1.98	1.35	0.75
				Man >> Man	51	1000	31	57	45.31	3.69	1.54
	2	0.03	63	Woman >> Woman	3	1000	0	11	3.27	1.72	−0.16
				Man >> Man	32	1000	24	46	35.24	3.88	−0.83
	3	0.05	63	Woman >> Woman	10	1000	1	17	7.00	2.46	1.22
				Man >> Man	49	1000	29	59	44.14	4.61	1.05
	4	0.05	65	Woman >> Woman	7	1000	0	13	5.58	2.21	0.64
				Man >> Man	75	1000	50	84	65.98	5.23	1.73

Observed values span the columns Density, No. of actors, Type of ties, No. of ties. *Random graph values* span the columns N, Min, Max, Mean, SD, z-score.

However, because the elite is predominantly male, this is not at all surprising. Therefore we also address this specific phenomenon with another strategy.

As discussed above, to take into consideration the skew distribution of men and women in these networks and the fact that up until now we compare estimates across four different graph configurations, we perform a second type of test on same-sex preference. In Table 5 we report results from a random graph simulation where the size (n) and density of the simulated graphs are equivalent to those of the observed networks. We then compare the mean number of same-sex connections in the distribution of simulated graphs to the number of same-sex connections in the observed networks. We repeat this analysis for the professional and private networks, and calculate the z-scores for the mean difference. The findings clearly suggest that with only one exception there is no sex-based homophily in any of the two networks in any of the four municipalities. Only in the professional network of our fourth municipality, a fairly affluent regional centre of commerce and agriculture characterized by relatively frequent shifts in political power and a well-diversified local economy, is there a clear tendency of women being more frequently connected to women, and men being more frequently connected to men, than what one would expect from chance. We conclude with confidence that there is no tendency to over-emphasize same-sex connections, not for women and not for men, and we therefore reject our hypothesis.

The results can be summarized along three lines: differences between men and women are consistently statistically insignificant; the direction of the differences between men and women is predominantly to women's disadvantage; there are consistent differences in how women and men are positioned in work-related versus private networks. For all indicators of networked power, we note very large standard deviations. This means that there is considerable inequality in the distribution of power among the local elite. However, sex is not a factor by which we can identify who has a lot of power and who has little.[12]

For sure, women are numerically underrepresented in Swedish local elites, but the results suggest that those women who actually make it into these tight circles are not on average any less prominent, influential or prestigious than their male counterparts. Based on these results, it is hard to escape the impression that if we disregard women's striking numerical inferiority, women are as well placed and uphold the same potential for networked power as men in the local elite.

Discussion

The gender structures of elites are important, as they not only reflect but potentially also reproduce – or even reinforce – systematic gender differences in the distribution of power and other resources. Earlier research has demonstrated that elites tend to be gender-skewed, with fewer women than men holding elite positions. In addition, it has been argued in earlier research that women are also excluded from the inner circles of elites, where the 'old boy network' dominates, and that the relatively few women that make it into the elites predominantly occupy peripheral positions in both the formal hierarchy and informal elite structures. Such a consequence does not follow directly from simply observing a skewed distribution and we found scant support in earlier research to back it up.

Using data from four Swedish municipalities, this article offers an empirical test of the claim that women are doubly excluded. More specifically, by using social network analyses we asked whether female elite actors are less centrally placed than men; whether female elite actors are less likely to exploit structural holes; whether female elite actors are less likely to broker between different elite spheres; and whether women's networks are less homogeneous than men's. Our results indicate that women are not significantly less centrally placed than men within the elite networks, nor less likely to occupy brokerage positions. We thus find good reasons to question the idea that women meet a double exclusion from elites. Our data support the claim that the threshold for entering elites is higher for women than for men; however, once inside the elite circles women do not tend to occupy less centrally placed positions than men. When it comes to homophily, the measure of sex heterogeneity suggests that women have somewhat more heterogonous contacts, but this difference is not statistically significant. This means that the male elite on average has a substantial interaction with the female elite (and vice versa), which suggests that there is no strong tendency for an old boys' network within the Swedish local elite. The lack of sex homophily is not surprising given the relatively equal distribution of power among male and female elites. To the extent that male elites have a preference for interacting predominantly with other men, they will have to suppress this preference if they also share a preference for interacting with high-status actors (cf. Blau (1977) on multiform heterogeneity). Our finding thus indicates that sex homophily is sensitive to tipping-point effects, and is more likely to be observed in settings in which the sex distribution of power is skewed toward male dominance.

We also found that men and women are positioned differently in their work-related versus private networks. The structure of private networks partly mirrors that of work-related networks: In private networks women seem to be more central than men and to occupy broker positions to a greater extent than men, although, again, these differences are not statistically significant. In her much cited analysis of a management firm, Ibarra (1992) found that network relations differed between men and women with respect to instrumental versus expressive relationships (in our case, work-related ties are equivalent to instrumental and private ties equivalent to expressive relationships). In Ibarra's study, women seemed to be more selective in network choices in order to achieve greater differentiation between expressive and instrumental relationships. Although we cannot untangle individual preferences in our data, our findings can be aligned with previous research suggesting that women and men tend to make strategically different network choices.

Our findings show that once we look beyond the numerical skewness of the sex balance in the Swedish local elite, the actual distribution of potential structural influence and power is more equally distributed. If the numerical representation truly is the challenge, then these results suggest that affirmative action based on gender could be an efficient policy to speed up equality between the sexes. However, it might be premature to draw such conclusions because the particular structures that we study here have emerged rather spontaneously without such policy interference. It would be interesting to study in detail if the same is true for those systems that have been under such pressure, such as Swedish higher education and the Swedish parliament.

One final question we need to address is how general our findings are. As discussed above, Sweden is not a representative case for studying gender inequalities. The institutional arrangements make it easier for a woman in Sweden to pursue a career of her own compared to most other places. There is also a culture of gender equality in Sweden, which is stronger than in most other countries, and as discussed

above the representation of women in political elites is unusually high. Previous research has demonstrated that gender differences in abilities tend to decrease or even disappear in situations in which a gender-equal culture prevails (Guiso et al., 2008), and there is also evidence that the stigma of being a minority is less burdensome and constraining the more who share this stigma (e.g. Elster, 1989). In other words, there are good reasons for assuming that it is easier for women to overcome traditional stereotypical gender norms of how to behave in public places (e.g. being submissive, quiet, keeping in the background, never flashing one's abilities or ambitions too explicitly), which when acted upon may be a hindrance to achieving a central position of power in elite structures in a context in which the representation of women is relatively high and in which a culture of gender equality prevails. This indicates the potential importance of tipping points, that is, the possibility that women are more likely to meet a double exclusion (being not only numerically disadvantaged but also occupying peripheral structural positions) in contexts in which the proportion of women is low – whereas the risk of double exclusion decreases when the proportion of women reaches a critical mass. More comparative research is needed to test these hypotheses and to answer the question of how unique the Swedish case is.

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Acknowledgement

Notes

1. What we have in mind is the jurisdiction of local politics, briefly discussed further on, and business role in local labour markets and regional economic growth.
2. There are actually 18 county councils and 2 regions. We refer to county councils and regions simply as county councils.
3. The current Local Government Act of 1991 came into force in 1992 (available online at http://www.sweden.gov.se/sb/d/574/a/29535). The first LGA dates back to 1862 and came into force in January 1863.
4. Boundary specification is critical to network analysis, and is almost always arbitrary. The challenge is to strike a balance between pragmatics (i.e. limited research and cognitive resources) and a good definition ensuring that all the 'important' actors and/or relations are included in the network.
5. The personal interviews included some additional questions and had a more loosely structured biographic section.
6. The exact wording of the question was: 'First of all, I would like you to look over the names on this list and mark with an X in column A those persons with whom you have had some form of work related contact during the past twelve months!'
7. The exact wording of the question was: 'Secondly, I would like you to once again look over the names on the list and mark with an X in column B those persons with whom you have had some other, non work related, private form of contact during the past twelve months!'
8. The exact content of these questions varied between municipalities, but the wording followed the general format of the previous two questions: 'Thirdly/fourthly, I would like you to mark with an X in column C/D the names of those persons with whom you have had some form of contact in direct connection to the process related to [the particular economic/environmental issue]...!'

9. We have conducted a range of supplementary analyses with logged independent variables in addition to the results reported and discussed here. Logging the independent variables reduces the variance, but does not change results in any substantial or statistically significant way.

10. In a majority of OLS models we lose eight observations mainly because we lack information on year of birth for these respondents. In the models regressing E-Index for homophily additional cases are dropped since network homogeneity, which E-Index is an indicator of, is not calculated for isolates.

11. The lowest adjusted R-square, 0.4 per cent, is found in the model for Aggregate constraint in the network of Private ties. The model regressing E-Index for sex-based homophily produced the highest adjusted R-square, 73.5 per cent.

12. A separate analysis of egocentric data (not reported here) on the same population confirms the small and insignificant sex differences. For egocentric network size, density and redundancy there are no significant differences between men and women in either private or professional relationships.

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