

Inherent motivation in legislative collaboration: Cosponsorship networks in three European parliaments*

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Abstract

Recent research on European parliamentarism has moved beyond the conception of parties as homogenous actors. Along with a growing interest in interactions within parliamentary party groups, the literature has begun to appreciate the relational component of legislative behavior. The present paper ties into this research and investigates the proposition that individualized legislative behavior is determined by party and electoral pressures on the one hand, and individual characteristics on the other. Using a novel and comparative dataset on cosponsored motions in three European parliaments, we assess determinants of legislative cooperation with Exponential Random Graph Models. The results show that in addition to strategic considerations, personal features and ideological convictions factor into patterns of intra-parliamentary collaboration.

Keywords: *Cosponsorship; Intra-party networks; ERGM*

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1 Introduction

In an effort to reappraise the status of individual actors in parliamentary affairs, a number of recent studies have challenged the dominance of party-centered perspectives on legislative behavior. Scholars have found that individualized strategies explain the use of parliamentary instruments (Bowler, 2010; Bräuningner, Brunner and Däubler, 2012; Martin, 2012), campaign efforts (Hennl, 2014; Zittel and Gschwend, 2008), and legislative speech (Bäck, Debus and Müller, 2014; Kam, 2009; Proksch and Slapin, 2012). These efforts have typically focused on the behavioral repercussions of electoral systems – personalized behavior as vote seeking (Carey and Shugart, 1995). The present paper builds on these findings and takes a more comprehensive perspective on individual legislative behavior by drawing on two bodies of research which have not featured prominently in studies of proportional representation systems. On the one hand, we refer to analyses of parliamentary behavior in the US which have highlighted the importance of individual policy preferences (e.g., Burden, 2007; Fowler, 2006*a*; Washington, 2008). On the other hand, we build on accounts which have claimed that female legislators cultivate a different parliamentary style which is "characterized by co-operation rather than conflict, [and] collaboration rather than hierarchy" (Norris, 1996, 93) and on the observation that gender constitutes a decisive factor in structuring preferences, re-election strategies and career incentives (Franceschet and Piscopo, 2008; Jones, 2009; Rosen, 2013; Waylen, 2014). We suggest that both components inform legislative behavior and patterns of parliamentary collaboration, above and beyond personalized parliamentary behavior as pure vote seeking.

To investigate legislative cooperation empirically, this contribution analyzes cosponsorship patterns in three Nordic legislatures – the Finnish *Eduskunta*, the Norwegian *Storting*, and the Swedish *Riksdag*. All three parliaments are characterized by high shares of female legislators, making them good cases to test for gender differences as cooperation is unlikely to be driven by cohort or adaptation processes. Methodologically, the paper employs a recent innovation in studies of individualized parliamentary behavior, Exponential Random Graph Models (ERGM), which allow researchers to draw systematic inferences on the determinants of networked data.

The results indicate that inherent motivations explain collaboration in legislative sponsorships. The contribution thus adds to several strands of the literature. First, finding that ideological convictions structure parliamentary cooperation speaks to the literature on intra-party politics which has struggled to identify clusters within parliamentary party groups (Boucek, 2009; Budge, Ezrow and McDonald, 2010; Giannetti and Laver, 2005; Mershon, 2001). Second, the observation of more frequent cooperation between female legislators is linked to a body of work which has assessed female parliamentary representation, gender-specific styles of politics (Childs, 2004; Norris, 1996), and the marginalization of female legislators (Heath, Schwindt-Bayer and Taylor-Robinson, 2005).

2 Determinants of parliamentary collaboration

2.1 Framing cosponsorship

The meaning of bill sponsorship varies by institutional context. In contrast to individual initiatives in European parliaments, private member bills in the US Congress have a clear legislative purpose (Mattson, 1995). This institutional divide is reflected in the theoretical frames that have been employed to conceptualize sponsorships. Despite the differences, the literature on sponsorship in Congress (e.g., Kessler and Krehbiel, 1996; Koger, 2003; Mayhew, 1976) and research on private initiatives in European contexts (e.g., Bowler, 2010; Bräuning, Brunner and Däubler, 2012; Kellermann, 2015) generally agree that sponsorship primarily serves a communicative function: Sponsorships are largely directed at voters to establish an electoral connection (Koger, 2003; Mayhew, 1976). Others have conceptualized bill sponsorship as a form of intra-legislative signaling. For example, Kessler and Krehbiel (1996) examine the timing of sponsorship decisions and find support for the proposition that a set of ideologically heterogeneous sponsors conveys the broad support and importance of a measure to fellow legislators.

Patterns of sponsorship have received far less scholarly attention outside the US due to the dominance of the executive branch in legislative matters. Instead, legislator behavior has long been treated as an expression of parliamentary party competition, particularly for

members of governing parties (Mattson, 1995, 451). Several studies have recently deviated from this path and begun to reconsider initiatives as voter persuasion tools (Bowler, 2010; Bräuninger, Brunner and Däubler, 2012; Kellermann, 2015). Most venues in which legislators get to nominally express their positions – notably voting and debate participation – are heavily regulated by partisan institutions (Proksch and Slapin, 2012; Sieberer, 2006). In contrast, individual parliamentary initiatives are open access instruments, where legislators have more leeway to voice their preferences and parties might even have incentives to let members promote deviating positions when they do not entail policy loss or damage to the party label (Kam, 2009).

A number of scholars have recently proposed utilizing individual motions to infer patterns of latent intra-parliamentary collaboration based on *cosponsored* motions (Bratton and Rouse, 2011; Cho and Fowler, 2010; Fowler, 2006*a,b*; Zhang et al., 2008). Legislators in most European parliaments can initiate motions without seeking support from their respective party groups, providing them with the opportunity to independently choose on what to communicate together with whom. The principal intuition that follows from this is that a commonly sponsored motion represents a manifest instance of a latent collaborative tie, such that the aggregate sponsorship network reflects actual intra-parliamentary collaboration. Crucially, this insight enables scholars to employ parliamentary initiatives for research on an otherwise inaccessible property.

2.2 Preference formation in legislative collaboration

Theories of legislative behavior have traditionally focused on the electoral connection (Mayhew, 1976). Since legislators' first and foremost concern is re-election, this perspective treats individual parliamentary instruments as vessels for informing voters, support groups and donors – to foster name recognition and to build a political profile (Kessler and Krehbiel, 1996). At the same time, research on the US Congress has highlighted influences on legislator behavior that are distinct from electoral considerations, which can be traced back to individual character traits. The idea of motivations rooted in personal characteristics (e.g. Fenno, 1978; Searing, 1994) and the importance of individual traits in policy making (Burden, 2007; Swers, 2005; Washington, 2008) are well established in research on parliamentary collaborations. For

instance, Harward and Moffett (2010) show that ideological proximity explains patterns of legislative collaboration, while Bratton and Rouse (2011) find that characteristics like race, gender and ethnicity influence the frequency of common cosponsorship activities.

Individual characteristics have also been an important perspective in research on parliamentary behavior in European legislatures. For instance, studies on role behavior have stressed the influence of individual-level motivations on adopting certain parliamentary roles (Blomgren and Rozenberg, 2012; Searing, 1994), while others have highlighted the impact of personal characteristics on legislative decision making (e.g., Baumann, Debus and Müller, 2015). Conversely, legislator characteristics have not yet been systematically evaluated in studies of *collaborative behavior* in European parliaments. This is particularly unfortunate in light of the mounting evidence that the effects of individual legislator characteristics are frequently invisible due to institutional and partisan arrangements (Baumann, Debus and Müller, 2015; Hug, 2010; Kam, 2009; Proksch and Slapin, 2012; Sieberer, 2006). Therefore, investigating the impact of personal features on legislative collaboration may provide a way of assessing otherwise latent effects. In the remainder of this section we identify two inherent preference components and discuss their impact on patterns of legislative collaboration – ideological preferences and the role of gender.

Ideological preferences are a fundamental determinant of legislative behavior (Curini and Martelli, 2015; Hix, 2002; Hix, Noury and Roland, 2006; Koger, 2003; Poole and Rosenthal, 1997; Saalfeld, 1995). As preferences structure legislator behavior even in parliaments with strong party discipline, they are likely to influence patterns of legislative collaboration. Beside individual-level effects, ideological convictions also partition legislators within party groups. Measurement difficulties notwithstanding, the literature has generally acknowledged the presence of intra-party groups and factions for most European parliaments (e.g., Boucek, 2009; Sieberer, 2006). Even though comparative evidence on intra-party groups is still lacking, several studies have identified intra-party dynamics in position taking (Budge, Ezrow and McDonald, 2010; Giannetti and Laver, 2005), government formation (Bäck, 2008) and portfolio allocation (Mershon, 2001). Dependent on the electoral system, parties have incentives to project a unified party label to prevent electoral damage resulting from intra-party dissent (Greene and Haber, 2015) and to ensure parliamentary unity to avoid policy loss (Giannetti

and Laver, 2009). Nevertheless, since legislative motions are an open access instrument we expect to find traces of ideologically cohesive subgroups, such that members of intra-party factions cooperate more frequently.

The two dominant dimensions of political contestation in most Western European political systems are an economic and a social dimension (Bornschieer, 2010; Kitschelt, 1994; Kriesi et al., 2006; Marks et al., 2006). We expect that legislators' preferences on both dimensions influence their cooperative behavior.

H1a: The closer two legislators are located on an economic dimension, the more likely they are to collaborate.

H1b: The closer two legislators are located on a social dimension, the more likely they are to collaborate.

Aside from ideological preferences, the literature has identified additional legislator characteristics that affect their parliamentary activities (Burden, 2007; Swers, 2005; Washington, 2008). Although these factors are frequently congruent with their preferences and therefore difficult to disentangle, this strand of research points toward a motivational core which structures parliamentary behavior. For instance, Burden (2007) argues that since constituents and parties cannot force their representatives to internalize their preferences, legislator decision-making is subject to a push and pull of external actors and intrinsic motivations. Beside moral convictions, parliamentarians also take into account experiences they have acquired during or prior to their parliamentary careers and lastly, legislators may even have policy motivations derived from self-interest.

Studies on the parliamentary representation of women and minorities have repeatedly highlighted that the affiliation with a minority group can be more important for policy preferences on a given proposal than party affiliations (Dodson, 2006; Wängnerud, 2009). While studies on the US Congress have frequently focused on race and ethnicity as central determinants of legislative behavior (e.g., Burden, 2007; Rocca and Sanchez, 2008), this aspect has featured less prominently in research on European parliaments (for an exception see Saalfeld, 2011). Instead, one of the main dividing lines in European parliaments is gender. The principal interest of research in this area is the effect of gender on legislative voting (e.g., Dunaway

et al., 2013; Stegmaier, Tosun and Vlachová, 2014). Similarly, Bäck, Debus and Müller (2014) find that women are overrepresented as speakers on *soft issues* and underrepresented on *hard issues* in plenary debates in the Swedish *Riksdag*. Behavioral differences have also been highlighted by studies on the consequences of electoral quotas (e.g., Fréchette, Maniquet and Morelli, 2008; Jones, 2009; Krook, 2014), contributions concerned with the impact of political institutions on the allocation of positions to women (e.g., Rosen, 2013; Siaroff, 2000; Waylen, 2014) and, relatedly, with the marginalization of female MPs (Heath, Schwindt-Bayer and Taylor-Robinson, 2005). Several studies have indeed shown that even if the share of female legislators is high, they face more obstacles in getting proposals passed (Franceschet and Piscopo, 2008) and are excluded from leadership positions (Heath, Schwindt-Bayer and Taylor-Robinson, 2005). These findings, along with the observation that female legislators cultivate distinct, more co-operative parliamentary roles (Norris, 1996), lead us to expect that female MPs facing marginalization engage more frequently in intra-group collaboration. Put differently, collaboration between female MPs may serve as a means to counteract marginalization tendencies thus making co-operation between women MPs more prevalent. This leads us to our second hypothesis.

H2: Female legislators are more likely to collaborate with other female legislators.

Finally, we expect constituency orientation and personal vote seeking to impact patterns of collaboration. The electoral connection is a well-established factor in prior research on cosponsorship in the US Congress (Campbell, 1982; Koger, 2003) that has also featured prominently in research on parliamentary behavior in European legislatures. Since the seminal contribution by Carey and Shugart (1995) provided the framework for linking electoral incentives and legislative behavior, this connection has been analyzed in a burgeoning literature. For instance, Bräuninger, Brunner and Däubler (2012) find that the introduction of flexible list elements in the Belgian proportional representation system created incentives for legislators to be more active in the initiation of private member bills. Bowler (2010) shows that British MPs benefit electorally from proposals and that MPs in more strongly contested constituencies use these instruments more extensively. Similarly, Kellermann (2015) and Martin (2012) find that parliamentary questions in Britain and Ireland are used to signal effort to constituents. We therefore expect that legislators have an incentive to cater to their con-

stituents in their parliamentary activities, conditional on the electoral system. Lastly, research on cosponsorship in US state legislatures (Bratton and Rouse, 2011) and the House of Representatives (Cranmer and Desmarais, 2011) shows that district proximity and representing the same state has a positive effect on the likelihood of collaboration. For countries in which the electoral system does not provide incentives to cultivate a personal vote – Norway in the present case¹ – we expect that legislators team up to represent their constituents' demands in parliament.

H3a: Legislators from the same constituency will collaborate more frequently in countries where the electoral system does not have a personal vote component.

In electoral systems with an incentive to cultivate a personal vote, which is the case in Sweden and Finland in the present analysis,² legislators may be subject to intra-party competition. In this case actors should try to build a reputation against their party fellows from the same district. In such systems we expect to observe more frequent collaborations between legislators from the same constituency but from different parties, whereas legislators from the same party and the same constituency should collaborate less frequently.

H3b: Legislators from the same constituency and the same party will collaborate less in countries where the electoral system has a personal vote component.

3 Cosponsorships, parliamentary networks and Exponential Random Graph Models (ERGM)

The interest in legislative collaboration notwithstanding, it has proven notoriously difficult to model the relational structure of cosponsorship data. Initial contributions on the subject have relied on descriptive network analysis (Cho and Fowler, 2010; Fowler, 2006*a,b*; Zhang

¹The Norwegian electoral system provides voters with an opportunity to cast preference votes. However, the number of preferences votes necessary to change the list order is prohibitively high, such that personal votes have never made a difference to the electoral result (Gallagher, Laver and Mair, 2011, 386).

²In Finland, votes are cast in an open list system, that is, votes are cast for individual legislators and the number of votes cast determine the rank order on the list. In Swedish elections, voters may cast a ballot for a constituency party list, or for a specific candidate.

et al., 2008).³ For example, in his analysis on cosponsorship behavior in Congress, Fowler (2006*a*) creates a measure of connectedness that predicts both influence and legislative behavior. Fowler (2006*b*) considers the same network and shows that strategic incentives shape cosponsoring behavior. Zhang et al. (2008) apply a community-detection algorithm to congressional cosponsorship networks and demonstrate the increasing polarization of Congress (cf. Layman, Carsey and Horowitz, 2006; Theriault, 2008). In a related study, Cho and Fowler (2010) show that network properties based on observed cosponsorships predict levels of legislative activity.

While the early contributions on the subject of cosponsorship networks have relied on descriptive techniques, scholars have more recently begun applying inferential tools. The most well-known class of models for inferential network analysis are Exponential Random Graph Models (ERGM; Cranmer and Desmarais, 2011; Robins et al., 2007; Wasserman and Pattison, 1996). The main advantage of ERGMs compared to ordinary tools for network analysis is that they allow for a systematic incorporation of structural properties of the network as well as covariates that predict the presence or absence of ties between nodes while handling the non-independence of observations that would invalidate analyses in a standard regression framework.

The principal intuition of models in the ERGM family is that the realized network is treated as a single observation from a multivariate probability distribution. To elaborate this notion let \mathbf{Y} be a random network variable and let \mathbf{y} be the observed network. Further, let \mathcal{Y} be the set of all possible networks with an identical number of nodes such that \mathbf{y} is a single realization of \mathcal{Y} . Finally, let \mathbb{Y} be the set of all possible dyads in the observed network. The general form of Exponential Random Graph Models is as follows:

$$\Pr_{\boldsymbol{\theta}, \mathbf{g}}(\mathbf{Y} = \mathbf{y} | \mathbf{x}) = \frac{\exp(\boldsymbol{\theta} \cdot \mathbf{g}(\mathbf{y}, \mathbf{x}))}{\kappa_{\mathbf{g}}(\boldsymbol{\theta}, \mathbf{x})}, \mathbf{y} \in \mathcal{Y} \quad (1)$$

$$\kappa_{\mathbf{g}}(\boldsymbol{\theta}, \mathbf{x}) = \sum_{\mathbf{y}' \in \mathcal{Y}} \exp(\boldsymbol{\theta} \cdot \mathbf{g}(\mathbf{y}', \mathbf{x}))$$

³Cosponsorships have also been applied in several analysis that were not specifically targeted at collaboration patterns, for example pertaining to individual cosponsorship behavior (Barnello and Bratton, 2007; Campbell, 1982; Harward and Moffett, 2010), to assess the signaling inherent in cosponsorships (Kessler and Krehbiel, 1996; Koger, 2003; Wilson and Young, 1997), and to gauge the dimensionality of the legislative agenda (Alemán et al., 2009; Desposato, Kearney and Crisp, 2011; Peress, 2013; Talbert and Potoski, 2002; Woon, 2008).

$\mathbf{g}(\mathbf{y}, \mathbf{x})$ is a q -length vector of network statistics that may depend on a set of covariates \mathbf{x} ; $\boldsymbol{\theta}$ is the associated vector of model parameters. The normalizing constant – the denominator $\kappa_{\mathbf{g}}(\boldsymbol{\theta}, \mathbf{x})$ – sums over all possible networks \mathbf{y}' in \mathcal{Y} . Note that network statistics which do not depend on \mathbf{x} – $\mathbf{g}(\mathbf{y})$ – are structural properties of the network, e.g., mutual relationships in a directed network.

The first ERGM-type model of parliamentary cosponsorships in selected US state legislatures was presented by Bratton and Rouse (2011). In a similar analysis, Cranmer and Desmarais (2011) consider cosponsorships in the U.S. House of Representatives. The methodological downside of both of these studies is that they binarize potentially extremely non-binary data. Cranmer and Desmarais (2011) consider all observed relationships as a collaborative tie – regardless of their strength. This is to say that 100 cosponsored motions have the same weight in their analysis as a single cosponsored motion. Bratton and Rouse (2011) improve upon this by analyzing *frequent cosponsorships* which they define using a threshold value – varying from state to state. Nevertheless, binarization of non-binary network data potentially introduces biases into the analysis and makes inferences doubtful (Thomas and Blitzstein, 2011). To overcome these problems, the present contribution explicitly incorporates the count structure of the network data. This is done using an variant of the ERGM for valued edges which was recently proposed by Krivitsky (2012). It extends the common ERGM framework with a reference measure $h(\mathbf{y})$.

$$\Pr_{\boldsymbol{\theta}, h, \mathbf{g}}(\mathbf{Y} = \mathbf{y} | \mathbf{x}) = \frac{h(\mathbf{y}) \exp(\boldsymbol{\theta} \cdot \mathbf{g}(\mathbf{y}, \mathbf{x}))}{\kappa_{h, \mathbf{g}}(\boldsymbol{\theta}, \mathbf{x})}, \mathbf{y} \in \mathcal{Y} \quad (2)$$

$$\kappa_{h, \mathbf{g}}(\boldsymbol{\theta}, \mathbf{x}) = \sum_{\mathbf{y}' \in \mathcal{Y}} h(\mathbf{y}') \exp(\boldsymbol{\theta} \cdot \mathbf{g}(\mathbf{y}', \mathbf{x}))$$

The reference measure $h(\mathbf{y})$ could potentially take on a number of functional forms, but we consider the Poisson case without additional restrictions.

$$h(\mathbf{y}) = \prod_{(i, j) \in \mathcal{Y}} (\mathbf{y}_{i, j}!)^{-1}$$

For the empirical analysis we investigate all parliamentary motions that were introduced in Norway (legislative term 2005–2009), Finland (legislative term 2003–2007), and Sweden

(legislative term 2006-2010). All three parliaments are characterized by high levels of party unity, and – to varying degrees – limited incentives to build a personal vote. Furthermore, all three parliaments have a high share of female legislators and have had so for several decades. This implies that observing frequent cooperation among female MPs is unlikely to be caused by cohort effects, i.e. by a large share of female MPs entering parliament at the same time. The procedural requirements for motions differ between the three parliaments. While motions in Finland and Norway (*Lakaliote* and *Representantforslag*, respectively) are private members bills and not limited in the issues they address, Swedish *Motioner* need to refer to an ongoing legislative proposal. Neither of the parliaments poses strong initiation restrictions (Mattson, 1995, 469). Most importantly, legislators in the Finnish, Norwegian and Swedish parliaments can initiate motions individually and do not need to seek support from their party groups. Coordination or filtering of motions by party groups is also unlikely from a practical point of view in all three cases, since motions can easily be kept off the floor – either by stopping them in committee (Finland and Sweden) or with a purely formal plenary vote (Norway).

To gauge collaborative relationships we assume that each signatory has an *undirected* tie to all other cosponsors.⁴ As legislators are not limited in the number of motions they can sponsor over the course of a legislative term, members typically have multiple collaborative ties – our data thus has count properties. To assess the theoretical propositions that were outlined in section 2 we estimate ERGMs for all motions in each legislature. Table 1 provides summary statistics for the underlying cosponsorship data.⁵ On average, there are approximately three members of parliament that cosponsor a motion in Norway, ten in Finland and four in Sweden. Turning the cosponsorships into network data yields 4,304 edges in Norway (668 unique edges), 48,666 edges in Finland (6,717 unique edges) and 189,617 edges in Sweden (9,978 unique edges).

⁴We discard motions with only a single author.

⁵The table lists data only for motions that meet the exclusion criterion, i.e. motions with at least two sponsors. Notice further that the number of legislators refer to the number of parliamentarians that have cosponsored at least one motion. It is not necessarily identical with the sizes of the assemblies. Note that we discard motions with more than 30 cosponsors in the Finnish and Swedish case for computational reasons. To be sure, there are good theoretical reasons for discarding motions with unusually high numbers of cosponsors as each tie is likely to be less meaningful compared to relationships which are evidenced by motions with few cosponsors (Fowler, 2006a).

TABLE 1: Summary statistics – Cosponsorships

	Norway (2005–2009)	Finland (2003–2007)	Sweden (2006–2010)
Number of legislators	88	183	382
Number of motions	483	383	7,375
Cosponsors per motion			
Mean	3.36	9.61	4.25
SD	1.07	6.67	3.31
Min	2	2	2
Max	8	30	30

To separate a strategic account of parliamentary collaboration from an account based on inherent legislator preferences, a number of covariates were selected. First, to assess the impact of preferences on collaborative ties, we calculate the absolute distance between parliamentarians on an economic and a social dimension (Benoit and Laver, 2006; Bornschier, 2010; Kriesi et al., 2006). The positions are estimated using a Wordscores model (Laver, Benoit and Garry, 2003) on all plenary speeches that were topically classified based on the Comparative Agendas Project coding scheme (Baumgartner, Green-Pedersen and Jones, 2006). To estimate positions on the two dimensions, we select all speeches pertaining to the economic or social dimension. It has been argued that positions derived from plenary speeches are unlikely to reflect the full spectrum of ideological perspectives among members of the parliamentary party groups (Kam, 2009; Proksch and Slapin, 2012, 2014). Proksch and Slapin (2014) argue that in systems where party unity is important for electoral success, backbenchers with extreme positions will face pressures from party group leaders to either moderate their positions in plenary speeches or else be substituted with a more moderate speaker. Although such effects do narrow the spectrum of ideological positions presented in the plenary, it is unlikely that more extreme voices are excluded from the plenary entirely. Therefore, the position estimates are possibly biased toward the mean position of the legislators' respective party groups, making it a somewhat conservative measure for the present purpose.

To test the hypothesis that female legislators collaborate more frequently, we include a gender dummy. The information on gender is included as a covariate at the node level and can thus be used to model the presence or absence of ties between nodes with the same

property. This allows separating patterns of collaboration between female, male and mixed pairs.

To assess the impact of electoral incentives on legislative cooperation, we include information on the party membership and electoral districts and interact these two variables. This information is included at the edge level, allowing us to compare pairs of legislators from the same constituency and/or the same party.

Disentangling the effect of personal ideologies, gender and electoral incentives on legislative collaboration requires controls for several additional factors. First, we control for membership in the party executive. Controlling for positions of prominence is advisable since well-known legislators might exhibit cosponsorship patterns that are different from rank-and-file members. The direction of this effect is, however, not clear and might even differ from assembly to assembly based on informal institutional arrangements. Highly visible members may either be less active due to time constraints and a legislative division of labor or else there might be an informal convention to frequently include prominent legislators, rendering this group more connected to other parliamentarians.

Previous research has also found that parliamentarians' career duration influences their legislative activities. The literature on political socialization suggests that as legislators become acquainted with parliamentary procedures, they become less active given more informal opportunities to shape policy (Hall, 1996; Harward and Moffett, 2010). Conversely, Searing (1994) finds that British MPs become increasingly constituency-oriented over the course of their careers, which might translate into a higher cosponsorship activity of seasoned parliamentary representatives.

A rather technical control is the duration of presence during the legislative term. Several legislators are not in parliament for the full duration of the legislative term and therefore had fewer opportunities to cosponsor parliamentary motions. To control for this effect we introduce a dummy variable to indicate whether a full term was served.

Lastly, we include information on committee memberships. This is a crucial control for assessing the impact of individual characteristics on legislative collaboration since such institutional arrangements are likely to structure opportunities for collaboration. Including

committee memberships as a variable at the node level allows us to control for frequent ties between legislators who sit on the same committees, thus disentangling effects of personal characteristics from effects which pertain to a shared policy specialization.

4 Explaining parliamentary collaborations

TABLE 2: Valued ERGMs – Norway

	Model 1	Model 2	Model 3
<i>Preference indicators</i>			
Ideological distance: Economic dimension			−0.26* (0.04)
Ideological distance: Social dimension			−0.12* (0.02)
Sex: Female (match)			0.57* (0.09)
Sex: Male (match)			0.00 (0.05)
<i>Strategic indicators</i>			
Party (match) & District (match)		3.54* (0.13)	3.54* (0.14)
Party (match) & District (no match)		3.48* (0.08)	3.41* (0.08)
Party (no match) & District (match)		0.10 (0.27)	0.06 (0.27)
<i>Controls</i>			
Experience	−0.03 (0.03)	−0.01 (0.03)	−0.01 (0.03)
Full term	0.59* (0.08)	0.20* (0.08)	0.17* (0.08)
Party leadership	−0.13* (0.04)	−0.04 (0.04)	−0.05 (0.04)
Committee membership (match)	0.89* (0.05)	1.22* (0.06)	1.24* (0.06)
Edges	−1.77* (0.17)	−3.34* (0.17)	−2.90* (0.18)
Nodes	88	88	88
Edges (unique)	668	668	668
Edges	4,304	4,304	4,304
AIC	−1,195	−5,161	−5,269
BIC	−1,164	−5,111	−5,194

Standard errors in parentheses

* indicates significance at $p < 0.05$

Table 2 presents the first ERGM for cooperation patterns in Norway. Model 1 introduces the control variables which are all plausibly signed.⁶ Previous legislative experience is not related to a higher baseline probability of having cosponsorship ties. Members that have served the full legislative term are more likely to share cosponsorship ties with other members. Conversely, members with leadership functions are significantly less likely to cosponsor motions in this model specification. Common committee membership has a strong and positive effect on the number of motions that two legislators cosponsor. Model 2 adds a set of covariates that reflect the candidates' electoral incentives – based on party membership and electoral district. Members from the same party have a much higher likelihood of cosponsoring motions than members from differing parties. This pattern of copartisan collaboration is almost independent of the electoral district as a match on this variable barely alters the coefficient.

This result is stable against the introduction of the preference indicators in model 3. Nevertheless, the additional variables systematically add to the explanatory power of the model as evidenced by the indicators of model fit. Specifically, both the ideological distance on the economic and social dimension have a significant negative effect on the number of motions that two members cosponsor. This finding provides evidence for our first hypothesis. Moreover, and in line with hypothesis 2, female pairs exhibit a significantly higher likelihood to cosponsor motions relative to male pairs or the reference category of a mixed gender pair. This seems to indicate a collaboration pattern that is not exhaustively described by pure gender-based homophily, but is more closely linked to an attempt of female legislators to collaborate on common issues. The control variables are reasonably similar across all three model specifications, although the party leadership variable is no longer statistically different from 0 in models 2 and 3.

Table 3 presents the results from the same model specifications for the Finnish case. While the full term control is identically signed as in the previous case, party leaders are significantly more likely to cosponsor motions in Finland. Previous parliamentary membership also has a significantly positive effect on the likelihood of cosponsoring motions. In contrast to the Norwegian case, there is no effect of a common committee membership on the number

⁶All models were computed using version 3.5.1 of the `ergm` package and version 3.2.0 of the `ergm.count` package in R (Hunter et al., 2008).

TABLE 3: Valued ERGMs – Finland

	Model 1	Model 2	Model 3
<i>Preference indicators</i>			
Ideological distance: Economic dimension			-0.04* (0.00)
Ideological distance: Social dimension			-0.05* (0.00)
Sex: Female (match)			0.26* (0.02)
Sex: Male (match)			0.04* (0.01)
<i>Strategic indicators</i>			
Party (match) & District (match)		2.24* (0.03)	2.21* (0.03)
Party (match) & District (no match)		2.15* (0.02)	2.12* (0.02)
Party (no match) & District (match)		0.33* (0.01)	0.30* (0.04)
<i>Controls</i>			
Experience	0.05* (0.01)	0.03* (0.01)	0.04* (0.01)
Full term	0.33* (0.02)	0.24* (0.02)	0.31* (0.03)
Party leadership	0.33* (0.01)	0.62* (0.02)	0.59* (0.02)
Committee membership (match)	-0.04 (0.02)	-0.02 (0.02)	-0.02 (0.02)
Edges	-0.36* (0.04)	-1.11* (0.04)	-0.91* (0.05)
Nodes	183	183	183
Edges (unique)	6,717	6,717	6,717
Edges	48,666	48,666	48,666
AIC	1,820	-10,079	-10,878
BIC	1,859	-10,017	-10,785

Standard errors in parentheses

* indicates significance at $p < 0.05$

of cosponsored motions. Once more, copartisan legislators have the strongest collaborative ties that are even stronger if the pair is based in the same constituency. This result contradicts our expectation regarding the electoral incentives in Finland. Since the Finnish open list electoral system provides legislators with the opportunity to skip ahead on the party lists, one would expect that members from the same party prefer not to collaborate with each other in order to build a personal vote. Finding that the coefficient for a match on party and district is slightly larger than the coefficient for pairs from the same party but different districts indicates that this is in fact not the case. One explanation for this counter-intuitive

TABLE 4: Valued ERGMs – Sweden

	Model 1	Model 2	Model 3
<i>Preference indicators</i>			
Ideological distance: Economic dimension			-0.03* (0.00)
Ideological distance: Social dimension			-0.01* (0.00)
Sex: Female (match)			0.30* (0.02)
Sex: Male (match)			-0.23* (0.02)
<i>Strategic indicators</i>			
Party (match) & District (match)		5.21* (0.03)	5.14* (0.04)
Party (match) & District (no match)		4.00* (0.02)	4.00* (0.03)
Party (no match) & District (match)		1.57* (0.05)	1.53* (0.05)
<i>Controls</i>			
Experience	0.20* (0.00)	-0.00 (0.01)	-0.00 (0.01)
Full term	1.63* (0.02)	1.65* (0.02)	1.60* (0.04)
Party leadership	0.13* (0.01)	0.48* (0.02)	0.50* (0.01)
Committee membership (match)	0.99* (0.01)	1.21* (0.02)	1.21* (0.03)
Edges	-3.14* (0.03)	-5.76* (0.05)	-5.53* (0.07)
Nodes	382	382	382
Edges (unique)	9,978	9,978	9,978
Edges	189,617	189,617	189,617
AIC	9,281	-28,715	-29,154
BIC	9,327	-28,642	-29,043

Standard errors in parentheses

* indicates significance at $p < 0.05$

finding may lie in the structure of the data. Since we are interested in relational patterns we discard single-sponsored motions. Yet, introducing constituency-oriented motions on their own may provide legislators with the best means to claim credit for these motions. Thus, the exclusion of single-authored motions may bias our analysis against finding support for Hypotheses 3a and 3b. For pairs from different parties and the same district we observe a significant, but much smaller effect. This result is in line with our expectation, since each legislator in a mixed-party pair can only expect to skip ahead on his or her own party list. In this case cross-party collaboration for district interests may benefit both members electorally.

The preference indicators tell the same story as in the Norwegian case. Both the ideological distance on the economic as well as on the social dimension are negative and significantly different from 0, suggesting that ideological preferences do determine the likelihood of legislative collaboration. We also find confirmation for the expected gender-specific collaboration effect, such that two female MPs have a significantly higher probability to cosponsor motions.

Finally, the Swedish models in table 4 reiterate the previous observations. We find a significant negative effect of ideological preferences on the likelihood of collaborative ties – both on the economic and social dimension –, while female pairs have a significantly higher probability of cosponsoring motions. Interestingly, male pairs have a significantly lower likelihood compared to the baseline of a mixed-gender pair. Once more, there are strong positive effects of copartisans on legislative collaboration that is highest for members from the same district. The control variables are comparable to the controls in the Norwegian case.

5 Conclusion

This contribution has aimed at disentangling the influences on legislators' cosponsorship behavior in three European parliaments – the Finnish *Eduskunta*, the Norwegian *Storting* and the Swedish *Riksdag*. The theoretical points of references were provided by the somewhat disparate literatures which have investigated legislative collaboration in the US and in Europe. Against the backdrop of a strong focus on electoral incentives which has dominated the research on individual parliamentarians in Western Europe, we have suggested that since individual parliamentary motions are open access measures which are largely unregulated by party groups, individual characteristics need to be taken into account. Although the incorporation of individual-level features like policy preferences has become increasingly commonplace in recent research, this insight has yet to be taken up by studies on cosponsorship in European legislatures.

Our findings are mostly in line with expectations. Above and beyond the strong effect that party membership exerts on collaborative ties, we find that ideological preferences play a role in legislative collaboration in all three countries. The further apart two legislators are on an economic and a social dimension, the less likely they are to collaborate on parliamentary

motions. This hints at the segmentation of members within party groups that has been suggested by the literature on intra-party politics (Boucek, 2009; Budge, Ezrow and McDonald, 2010; Giannetti and Laver, 2005; Mershon, 2001).

Conversely, our results regarding electoral incentives do not match up with *a priori* expectations. We did not find confirmation for the proposition that legislators from the same party and the same district collaborate less frequently due to intra-party competition. As noted, this negative finding may be driven by the analytical focus of the present contribution: Given a relational study design, we discarded single-authored motions. It is possible that legislators who face intra-party competition voice constituency interests in single-authored motions. A second possible explanation for observed pattern might be that there are additional electoral concerns that are not well captured by our measure, such as incentives based on the properties of the constituency. For instance, previous research has identified electoral incentives stemming from decentralized re-nomination procedures (Hazan, 2014; Hazan and Rahat, 2010), which are similar to those from electoral systems. For instance, since re-nomination in Norway is fully decentralized, MPs in the legislatures selected for this study may be subject to strong and diverse cross-pressures from their constituency, which are not captured by a simple open versus closed list distinction.

Turning to the last individual-level characteristic investigated, we find that female legislators exhibit systematically different collaboration patterns in that female pairs are significantly more likely to collaborate in all three parliaments. Two aspects of this finding are particularly noteworthy: First, since only female pairs are more likely to cooperate in all three cases, this finding is not well explained by mere gender-based homophily. Second, keeping in mind that our models control for common committee membership and thus for shared topical concerns, this result implies that female legislators have a higher tendency to collaborate across issues in the parliaments under considerations. Put differently, our findings suggest that the institutional division and treatment of policy issues in the committee system cannot explain a greater likelihood of women to cosponsor parliamentary motions. This finding has broader implications for studies on representation of women in European parliaments: If the prevalence of cooperation between female MPs is higher and cannot be explained by a gender-specific issue focus, cooperation is likely to constitute a rational strategy

by female MPs to counter disadvantageous intra-parliamentary institutional settings. This has implications for the debate on the marginalization of female MPs (e.g., Heath, Schwindt-Bayer and Taylor-Robinson, 2005; Kerevel and Atkeson, 2013), but also more broadly for critical mass theory (e.g., Studlar and McAllister, 2002), which has considered the behavioral repercussions of rising female representation on MP behavior.

A higher collaboration probability collaboration among female legislators is also in line with recent findings which show that female legislators' parliamentary activities differ from their male colleagues' (Bäck, Debus and Müller, 2014; Franceschet and Piscopo, 2008). The present contribution thus adds to the discussion on the effects of more gender-balanced parliamentary representation by providing evidence for gender-based differences in parliamentary behavior. One way forward may therefore be to apply an identical analytical framework to parliaments with lower shares of female MPs. This may enable researchers to assess how a rising share of female MPs impacts individual parliamentary behavior and thus contribute to the question of *how* a rising female representation in parliament does make a difference.

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