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Position in formal structure, personal characteristics and choices of advisors in a law firm: a logistic regression model for dyadic network data [1]

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Abstract

This paper presents a statistical model for the analysis of binary sociometric choice data, the p_2 model, which provides a flexible way for using explanatory variables to model network structure. It is applied to examine the influence of the formal structure of an organization on interactions among its members. It is shown to provide a general and precise method for addressing this substantive issue. We identify the respective effects of position in the formal structure (status, seniority, division of work and office membership) and selected personal characteristics of members of a corporate law firm on their choices of advisors. Flows of advice are shown to be consistently shaped by status games and the pecking order in the firm. Other dimensions help members in mitigating the effect of this strong rule. This approach ultimately provides more understanding of how members of such firms try to balance cooperation and competition in terms of access to and management of key resources. © 1997 Elsevier Science B.V.

1. Organized collective action, identities and resources

Formal structures are attempts at coordinating individual and collective actions (Blau, 1957, Blau and Scott, 1963). They do so by imposing constraints on, and offer opportunities for, access to resources. Of particular interest to sociologists of organizations using network analysis, formal structures try to constrain some actors' abilities to form ties, or specific types of ties, and therefore confine the extent to which actors can shape or reshape their networks so as to 'optimize' their returns (Lin and Dumin, 1986, Flap and De Graaf, 1989, Burt, 1992, Ibarra, 1992a, 1993, 1995). For instance, they can

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trap members of an organization by forcing them to preserve old ties when their interest would be to switch them; thus, they reflect and reproduce inequalities. Describing accurately the relationship between formal structure and interactions is therefore of primary importance to studies of collective action. Without such accuracy, we would not be able to properly disentangle effects of various variables on behavior, and design a comparative research.

Constraints on members' actions and interactions can take many forms, including managerial rules addressing the distribution of control over resources necessary for collective action (French and Raven, 1959, Emerson, 1962, Blau, 1964). This control is allocated to members with specific attributes, i.e. members who can claim to represent an identity officially recognized by the organization. Following many authors inspired by a 'structural' version of interactionist theories (Hughes, 1958, Turner, 1962, McCall and Simmons, 1966, Freidson, 1976, Maines, 1977, Handel, 1979, Stryker, 1980, Fine, 1992, Lazega, 1992a), we view formal structures as formal constraints on negotiations of identities, which are ultimately constraints on the distribution and changes of resources, and thus on actual behavior. Formal identities are formal attributes which allow members to claim access to specific resources legitimately; they are the keys of access to resources.

Organizations attempt to limit the number of identities that a member can legitimately claim in a work environment, and to distribute them (Lazega, 1992b). Claims are accepted or not by others, which implies that mechanisms other than formal contribute to the definition of priorities in identity negotiations (Laumann et al., 1983). Actors often introduce personal attributes in their struggle for access to resources. They can delegitimize each other as representatives of a formal identity to which resources are attached, and use particularistic attributes in ways not anticipated by formal structure. For instance, managerial attempts to control access to resources meet with resistance from other members in the organization (Ibarra, 1992b). The latter may compete for the right to claim representation of a formal identity. Or, if they do not have (all the) officially required attributes necessary to do so, they can try to access resources regardless of whether or not the formal structure allows them to do so. For such an access, they can use similar or different attributes or identities than those to which the formal organization attaches control over resources. In particular, they can use similarities with other members which are based on attributes acquired and defined from outside the organization, over which the formal organization has no control. Sociological research has long shown that such similarities contribute in driving interactions and exchanges (Weber, [1921] 1978).

The struggle between control of resources based on formal or on personalized access to resources produces a relational structure for each type of resource. Members' position in this overall relational structure of an organization usually indicates that constraints other than formal weigh on the way members identify themselves as an exchange partner, or differentiate themselves from others as a source of action. When we observe relational structures, we see a more or less permanent result of such mechanisms of competitive struggles for resources. A relational pattern reflects a partial equilibrium reached by members' competition for formal and informal control over the allocation of a specific resource. This partial equilibrium has already incorporated formal structural

constraints on the allocation of that resource (although perhaps never strongly enough from the perspective of management). Therefore, it reflects a broader collective action system.

This conception of the relation between organized collective action, identities and resources implies that there are at least two steps in the analysis and description of structural constraints on behavior and interactions. The first is to describe these constraints as a struggle for resources, and the advantages provided by formal attributes in this struggle. The second is to describe the specific equilibrium in the distribution of resources reached by this struggle. In this paper, we illustrate the first step by looking at the struggle for access to a specific resource, advice. [2] We look at the effect of attributes or identities on advice seeking and exchange in a collegial organization. We have classified identities as formal attributes (related to status, seniority, specialty and office) and informal or personal (gender and lawschool attended before entering the firm). Advice is a vital resource in such organizations. It is also a resource which a priori gives more chances to different kinds of attributes as keys for access. In effect, members of the firm are not formally requested to provide advice if they do not want to. Access to advice is a delicate matter (Blau, 1964, Lazega, 1995), and the choice of this resource should make the struggle visible.

We look at the respective effect of these identities using a statistical method particularly well designed for that purpose. Data used to study this question are usually data on the informal interactions and position of actors in the formal structure. Examples can be found in Baker (1992), Lazega (1992b, 1995) and Stevenson (1990). The methodology for the statistical analysis of these data in those examples is based on loglinear analysis or logistic regression where the unit of analysis is the actor and the dependent variable the count that results from aggregating each actor's sociometric choices. Aggregation implies that it is only possible to assert propositions about the number of choices made by actors in the network in connection with their formal position. By assuming each actor's choices to be independent, such studies do not take into account the fact that the informal interactions between actors may be mutually related.

In this paper we use a statistical model for the analysis of binary sociometric choice data, the so-called p_2 model, providing a more general and more precise method for addressing this question of the relationship between formal structure, interactions and the struggle for resources. It is a generalized logistic regression model based on the well-known p_1 model of Holland and Leinhardt (1981). An important assumption in this model is dyad independence. The dependency between the two relationships constituting a dyad as well as the interdependence between relationships from and to one actor are taken into consideration in the p_2 model. The explanatory (independent) variables are actor and dyad characteristics, related to or derived from actors' formal positions and other relative characteristics.

In the next section the p_2 model is presented together with its derivation from the p_1 model and its connection with existing models and methods. The data collected in a

[2] For the second step of the process analyzed for the same network, see Lazega (1995, 1997).

Northeastern US corporate law firm are presented in the third section, and analyzed with the p_2 model in the fourth section. Substantive results show that, in this firm, dimensions such as status and seniority shape the flows of advice so strongly that the use of any other attributes, whether formal or personal, functions as a mitigating strategy. In a context of career and symbolic competition, members use similarities in terms of office membership and specialty, and to a lesser extent gender and lawschool attended, in order to deal with the effects of status games and get access to an important resource such as advice.

2. The p_2 model

2.1. Model specification

The p_2 model is a model for the dyadic ties as the dependent variable. It can be viewed as an extension of the well-known p_1 model (Holland and Leinhardt, 1981) with actor and dyad attributes, and with the (many) actor parameters replaced by random effects. Another way to view it is as a logistic regression model for the ties, to which a reciprocity effect is added as well as random sender and receiver effects.

In the p_1 model, the unit of analysis is the dyad, the pair of directed relations (or sociometric choices) between two actors in a network, thus taking into account the (inter)dependence between these two relations. For the four possible outcomes of a dyad given the dichotomous nature of the relations, the p_1 distribution is defined as

$$P(Y_{ij} = y_1, Y_{ji} = y_2) = \exp\big(y_1(\mu + \alpha_i + \beta_j) + y_2(\mu + \alpha_j + \beta_i) + y_1 y_2 \rho\big)/k_{ij}$$

where y_1, $y_2 = 0$, 1 and $k_{ij} = 1 + \exp(\mu + \alpha_i + \beta_j) + \exp(\mu + \alpha_j + \beta_i) + \exp(2\mu + \alpha_i + \alpha_j + \beta_i + \beta_j)$. The parameters α, β, ρ and μ specify, respectively, the propensity of actors to send choices, receive choices, reciprocate choices and the mean tendency (density) to interact with each other.

In the extension of the p_1 model with actor attributes (Fienberg and Wasserman, 1981), the actors are grouped on the basis of their attributes. Each group is assumed to have the same characteristics with respect to the four types of propensities specified above. A more general extension of p_1 in this direction, sometimes called stochastic blockmodelling, is given by Wasserman and Weaver (1985) and by Wang and Wong (1987). Other extensions of the p_1 model are in the direction of multiple and/or valued relations (Wasserman and Galaskiewicz, 1984, Fienberg et al., 1985, Wasserman and Iacobucci, 1986). See Wasserman and Faust (1994) for an extensive treatment of these models. Wasserman and Pattison (1996) connect the p_1 model to Markov random graphs (Frank and Strauss, 1986) and estimation with logistic regression methods (Strauss and Ikeda, 1990), leading to the p^* model which incorporates structural network characteristics. Han (1996) analyzes the ties in a network with a logit model with actor attributes as explanatory variables. This model does not contain dyadic effects, such as reciprocity, or dependence between ties from and to the same actor.

The extensions of the p_1 model with actor attributes have been, up to now, restricted to categorical attributes with a small number of categories. This was necessary for formulations that remain within the framework of loglinear models. The limitations of the p_1 model, including these extensions, are the following: (a) continuous actor covariates cannot be taken into account; (b) dyad-level covariates cannot be taken into account (although extensions to categorical dyadic covariates are possible); (c) the number of parameters is at least twice the number of actors—this is a large number that may lead to overfitting; (d) effects that are not related to actors or to dyads cannot be modeled (e.g. transitivity or subgroups). The p_2 model overcomes the first two limitations by allowing arbitrary covariates for each of the parameters α, β, ρ and μ. It clears the third limitation by modeling the residual (non-explained) parts of the actor parameters as random instead of fixed effects. The fourth limitation is not directly dealt with by the p_2 model (this is done by the p^* model). However, much or all of for instance subgroup effects can often be explained by dyadic covariates such as similarity indicators. Therefore, the practical importance of the fourth limitation is mitigated in cases where good dyadic covariates are available.

The sender and receiver parameters α and β for each actor are regressed on a set of covariates, leading to

$$\alpha_i = X_{i1}\gamma_1 + A_i$$

and

$$\beta_i = X_{i2}\gamma_2 + B_i$$

where X_{i1} and X_{i2} are vectors containing actor i's attributes for the sender and receiver parameters. These attributes may be the same, distinct or partially overlapping. γ_1 and γ_2 are vectors containing the regression coefficients. A_i and B_i are random actor parameters that can be viewed as error terms in the regression equation, or equivalently, as unexplained parts of the sender and receiver parameters.

It is assumed that the expected values of all A_i and B_i are equal to 0 and that they have variances σ_A^2 and σ_B^2, respectively. Since the sender parameter of one actor is the same for all relationships this actor is involved in, this means that these relationships are related via the common error term. The same holds for the receiver parameter of one actor.

Further, it is assumed that the covariance between A_i and B_i is equal to σ_{AB}, and that the covariances between error terms not belonging to the same actor are equal to 0. This implies that the sender and receiver parameters of one actor are related and, therefore, that relationships from and to the same actor are related, that is, that they are not independent.

Note that the regression formulation implies a reduction of the number of parameters. The sender and receiver parameter (in the p_1 model one for each actor) are replaced by fewer regression coefficients plus two variance parameters and one covariance parameter. If no covariates are available, then only three parameters remain, the variances of the sender and receiver parameters and the covariance between them.

The random effects A_i and B_i imply a stochastic dependence between ties originating from, or going to, the same actor. Thus, the dyads are not independent. This

stochastic dependence, however, models the same structural features that are modeled in the p_1 model by the actor-bound parameters: there are differences between actors in (unexplained) productivity and attractiveness, and these two characteristics may be related. Therefore, this stochastic dyad dependence is not an important relaxation of the assumption of dyad independence that was criticized, among others, by Krackhardt (1988).

In the p_2 model the density and reciprocity parameters are also further modeled, i.e. a linear relationship between these parameters and dyadic attributes is assumed. For this we go back to the original formulation of the p_1 model where the density and reciprocity parameters were indexed for each sender and receiver (i.e. for each dyad), but, for reasons of identification, were constrained to be the same for all dyads. In that sense, the p_1 model can be viewed as a saturated model for the dyads. In the p_2 model, since we already have reduced the number of parameters to be estimated, we do not have to make this restriction. Formally, the parameters are modeled as

$$\mu_{ij} = \mu + Z_{ij1}\,\delta_1$$

$$\rho_{ij} = \rho + Z_{ij2}\,\delta_2$$

Z_{ij1} and Z_{ij2} are vectors with attribute variables for the dyad with actors i and j. Sometimes, but not necessarily, these variables are derived from the actor covariates. In this way the concept of similarity can be introduced for the explanation of the density or reciprocity of ties. Because of its substantive interpretation, reciprocity is assumed to be constant within dyads: $\rho_{ij} = \rho_{ji}$ and therefore we require $Z_{2ij} = Z_{2ji}$. It is advisable not to use dyadic attributes to model reciprocity that are not used to model density. In that way it is possible to distinguish reciprocity effects from density effects, analogous to the distinction between interaction and main effects. To understand the distinction between the interpretation of density and reciprocity effects, it helps to bear in mind that in the original formulation of the p_1 model ρ_{ij} is the log-odds ratio in the 2×2 table corresponding to the dyad with actors i and j. The probability that $Y_{ij} = 1$, however, is an increasing function of the density μ_{ij} but also of ρ_{ij} (see also Van Duijn and Snijders, 1996). A positive effect of a dyadic covariate on density has the interpretation that a relation is more probable in dyads with a higher value of the covariate (leading to higher probabilities for asymmetric and mutual dyads). A positive effect on reciprocity has the interpretation that a symmetric dyad is more probable. It is superfluous to include raw sender or receiver variables in the density model because the same effect is obtained by including these in the covariates for the sender and receiver parameters.

2.2. *Model estimation and testing*

For the estimation of the p_2 model two steps are taken to come to an approximate likelihood function that can be maximized using the iterative generalized least squares (IGLS) algorithm. The first step is to disentangle the probability function for a dyad, $P(Y_{ij}, Y_{ji})$, into two separate probabilities $P(Y_{ij})$, the probability of the directed relationship from actor i to actor j, and $P(Y_{ji}|Y_{ji})$, the conditional probability of the directed relationship from actor j to actor i, given the reverse relationship. (Recall:

$P(Y_{ij}, Y_{ji}) = P(Y_{ij}) \times P(Y_{ji}|Y_{ij})$.) These probabilities are derived from the definition of the p_2 model in the preceding section. This completes the specification of the p_2 model which can then be viewed as a generalized linear mixed model and be estimated with iterative generalized least squares (see e.g. Goldstein, 1995). In the application of this algorithm we linearize the probabilities in every iteration step with a first order Taylor approximation and after convergence obtain estimates of the regression parameters μ, ρ, γ_1, γ_2, δ_1, δ_2 and of the variance/covariance parameters σ_A^2, σ_B^2, σ_{AB}. We also obtain standard errors of these parameters as well as a value of the likelihood function. Both are based on the approximation with the normal distribution in the found solution, and can be used for testing (approximate t-tests, Wald tests or deviance (likelihood ratio) tests) and for model selection. Details of the estimation procedure can be found in Van Duijn (1995) and Van Duijn and Snijders (1996) who also developed a program, written in Gauss (Aptech Systems, 1994) for the estimation of the p_2 model. The approximations work better for the t-tests and Wald tests than for the deviance tests, so model selection should be based mainly on the former type of test.

3. The advice network in a Northeastern corporate law firm

Substantively, we draw on a case study (Lazega, 1992b, 1995) in the sociology of organizations to illustrate the argument. The study is based on fieldwork conducted in a New England corporate law firm (71 lawyers in three offices, comprising 36 partners and 35 associates) in 1991. All the lawyers in the firm were interviewed. In the Nelson (1988) terminology, this firm is a 'traditional' one, as opposed to a more 'bureaucratic' type. It is a relatively decentralized organization, which grew out of a merger, but without formal and acknowledged distinctions between profit centers. It adopted a managing partner structure during the 1980s for more efficient day-to-day management and decision making. Managing partners are not 'rainmakers' and do not concentrate strong powers in their hands. Although not departmentalized, the firm breaks down into two general areas of practice: the litigation area (half the lawyers of the firm) and the 'corporate' area (anything other than litigation).

Interdependence among attorneys working together on a file may be strong for a few weeks, and then weak for months. Sharing work and cross-selling among partners is done mostly on an informal basis. Given the classical stratification of such firms, work is supposed to be channeled to associates through specific partners, but this rule is only partly respected. Partners' compensation is based exclusively on a seniority lockstep system without any direct link between contribution and returns. The firm goes to great lengths, when selecting associates to become partners, to take as few risks as possible that they will not 'pull their weight'. As a client-oriented, knowledge-intensive organization, it tries to protect its human capital and social resources (Smigel, 1969, Gilson and Mnookin, 1985, Nelson, 1988, Lazega, 1992b), through policies such as commingling partners' assets (clients, experience, innovations) and the maintenance of an ideology of collegiality. Informal ties of collaboration, advice and 'friendship' (socializing outside), are key to the integration of the firm (Lazega, 1992b).

In such a context, members rely heavily on advice from others. Advice is an important resource in professional and collegial organizations (Wilensky, 1967). Without it, corporate lawyers cannot solve the usually complex legal problems that they handle (Lazega, 1995). Given the importance of this resource, it would be easy to believe that flows of advice in the firm are 'free', or at least that they do not encounter structural obstacles which would systematically prevent exchanges of intelligence between any two members. However, even in a context saturated with advice, many factors including formal dimensions of the structure and derived attributes influence advice seeking and create obstacles for exchanges of ideas. Among such formed dimensions, we look at the extent to which status, seniority, office membership and division of work have an effect on exchanges of ideas among members. We also look at the extent to which more personal attributes, such as gender and lawschool attended, have such an effect. Information on advice seeking was collected using a standard sociometric name generator. All the lawyers in the firm answered the following question.

> Here is the list of all the lawyers in the firm. To whom do you go for basic professional advice, for instance when you want to make sure that you are doing things right when handling a case, not simply technical advice? Would you go through this list, and check the names of those persons.

In quantitative terms, answers to the question vary extensively. At both extremes, we have a partner who says that he does not need nor ask anyone for advice, and another partner who declares seeking advice from 30 other colleagues. On average, lawyers have in their network 12 colleagues with whom they can exchange basic work-related ideas. General density of the network is 17.7%. However, such indexes may be misleading. They hide structural effects constraining resource flows, as well as advantages from which some members benefit given their position in the collective action system of the firm. Using p_2 analysis we offer results describing such effects, thus connecting identities and access to a highly valued resource.

4. Results

To study the effect of formal structure on advice seeking behavior, we used as covariates five dimensions of the structure of this firm which were expected to be the most important: seniority, status, office, specialty, gender and lawschool attended. Table 1 presents the distribution of lawyers in this firm per variable.

The first covariate is status, a variable with two levels, partners and associates, where the reference category is associate. We can hypothesize that status matters in the flows of advice in the sense that exchanges are very likely to be asymmetric. This variable is elaborated upon in the second and third covariate. The second covariate is a variable with three levels, indicating three possible levels of seniority for a partner. This variable is transformed into two dummy variables, indicating the first and second level of seniority. The third covariate is related to the seniority of associates, taking the values 1 through 5. We can thus look at gradual effects of numerical rank on the choices of

Table 1
Distribution of lawyers per variable

	Partner	Associate	Total
Seniority Level 1	14	7	
Seniority Level 2	13	10	
Seniority Level 3	9	5	
Seniority Level 4		7	
Seniority Level 5		6	
Total	36	35	71
Office 1	22	26	48
Office 2	13	6	19
Office 3	1	3	4
Specialty litigation	20	21	41
Specialty corporate	16	14	30
Men	33	20	53
Women	3	15	18
Lawschool Ivy League	12	3	15
Lawschool New-England non-Ivy League	11	17	28
Lawschool other	13	15	28

advisors. One can make the hypothesis that the longer you are in the firm, the more people come to you for advice (receiver), and the longer you are in the firm the less you ask for advice.

All these actor attributes concern the formal position of the lawyers within the firm. We have deduced nine dyadic attributes either expressing the similarity of these positions or their dissimilarity in terms of superiority. The (symmetric) similarity variables are (in increasing refinement) similarity of status, taking value 1 if both actors in the dyad are partners or if they are both associates; similarity in status among partners, i.e. 1 if they are both partners; three variables to express similarity in level of seniority for partners, i.e. the first is defined 1 if they are both top seniority partners, the second if both are partners of Level 2 and the third if they are both junior partners; similarity in status for associates, i.e. 1 if they are both associates with the same level of seniority. For associates, seniority has the meaning of being member of a cohort recruited the same year. An important difference here will be between being in the same level of seniority vs different levels (same seniority level vs not).

The first constructed most general asymmetric variable is 'superiority', that takes value 1 if the relation is directed from i to j and i has a lower level of seniority than j; it takes value -1 if the relation is directed from j to i and i has a lower level of seniority than j. A similar definition is used for defining superiority for partners where i and j both have to be partners, for superiority for associates where i and j both have to be associates, and for superiority of partners with respect to associates, where i is associate and j is partner.

It is important to realize that not all of these covariates can be used at the same time, because of dependency between them. For instance when only status is used to distinguish formal positions of partners, then similarity in status or similarity in status

for partners and superiority among partners or superiority of partners with respect to associates can be used for the modeling of the density parameter.

The other covariates are other actor attributes and derived similarities. The fourth covariate is office. From this variable two dummy variables are derived, one for the second office, and one for the third office. The reference category is the first office (which has most lawyers). This dimension can be expected to have an influence on choices of advisors because it makes access easier, but also because the ties which facilitate exchanges of advice are more likely to exist among members of the same office than among members of different offices. The fifth covariate is specialty, a variable with two levels, litigation and corporate where the reference category is litigation. Insofar as advice is work-related, this dimension representing the division of work within the firm can be expected to have an effect on the choice of advisors. The sixth covariate is gender, where the reference category is men. This dimension of the firm can be expected to have an influence on choices of advisors insofar as members of each category may feel more comfortable with such personalized homophilous choices. It should, however, be reminded that most women in the firm are associates. The seventh covariate is lawschool attended, a variable with three levels. From this variable again two dummy variables are derived: the first indicating whether or not a lawyer went to an Ivy-League lawschool, and the second indicating whether or not a lawyer went to a New England non-Ivy-League lawschool. The reference category is other university. This variable is introduced in the model to look at the extent to which a form of prestige acquired outside the firm has an effect on the choices of advisors. From these attribute variables, we constructed similarity variables, all dummy variables indicating having the same gender, working in the same office, having the same specialty and having attended the same lawschool.

4.1. Model selection

Given the size and complexity of the data, we decided to first analyze the data of advice relationships among associates separately, then among partners separately. We start with the presentation of the analysis of advice relationships among the 35 associates. Since we are working with approximated values of test statistics and the log-likelihood function (deviance), the model selection process is not a straightforward matter. Normally, forward or backward model selection procedures are used, starting with an empty model (with no explanatory variables) or a full model (with all explanatory variables). Likelihood ratio test statistics can then be used to compare the 'nested' models, leading to nicely decreasing or increasing values of the log-likelihood function. For our data, we found that it is not easy to apply these procedures because the approximated deviances tend to fluctuate. (This is also experienced when working with other generalized linear models with random coefficients as treated in Goldstein, 1995.) We therefore chose to apply a forward selection procedure where we carefully inspect the possible effects. We estimated a model in which one explanatory variable (that may have more levels) is added for the sender parameter, the receiver parameter, or for both, or for the density parameters, or the density and reciprocity parameters together. In this way, we are able to investigate which covariates are good candidates for the explanation

of the parameters. After making a selection of the most important explanatory variables (in terms of significance of their parameter estimates, i.e. a standard error at least two times smaller than the parameter value), the p_2 model is estimated again with these variables. The final step in the selection procedure is to remove variables that are no longer significant in the joint model. For all models the variance components and the 'general' density parameter μ and reciprocity parameter ρ are part of the model.

4.2. Associates' choices of advisors

Table 2 presents the results of the final model with significant parameters for the analysis of choices of advisors by associates. The parameter estimates of μ, ρ, etc. are given together with their standard errors.

In the first step of the model selection process, we find significant effects of the office and specialty similarity variables for the explanation of the density parameter. Being in the same office or practicing the same type of law has a positive effect on establishing an advice relationship. We find a similar positive effect of having the same level of seniority. Another important status variable is seniority superiority, which has a negative effect on density for relations of associates higher in rank to ones lower in rank; further we find a positive sender effect of associate seniority level (i.e. associates with a higher level (= lower in rank) seek more advice) and a negative receiver effect of the same variable. Finally we find a negative sender effect of specialty, i.e. corporate associates tend to seek advice less than litigators.

In the second step, after estimating the p_2 model having all the covariates, the sender effect of associate level and specialty are not significant anymore, and are removed from the final model given in Table 2. Compared with the estimates of the variance parameters and of the density and reciprocity parameters of the empty model, the estimates of μ and ρ are lower (than in the empty model). Not surprisingly, adding explanatory variables for the density parameter has reduced the 'constant' term. Although no covariates were found to 'explain' reciprocity, it is partly explained by the other covariates. For example, positive effects of dyadic similarity variables on the density parameter will explain a portion of the observed reciprocity. The receiver effect

Table 2
P_2 estimates of associates' choices (standard errors in brackets)

	Parameter	Empty model	Final model
Sender	Variance σ_A^2	1.38 (0.27)	1.84 (0.37)
Receiver	Variance σ_B^2	1.20 (0.25)	0.73 (0.18)
	Seniority level		−0.33 (0.12)
Sender–receiver	Covariance σ_{AB}	−0.61 (0.20)	−0.59 (0.20)
Density	μ	−2.06 (0.23)	−3.68 (0.46)
	Similarity seniority		0.98 (0.20)
	Superiority seniority		−0.47 (0.14)
	Similarity office		1.76 (0.27)
	Similarity specialty		1.59 (0.22)
Reciprocity	ρ	1.84 (0.28)	1.51 (0.33)

of associate seniority level explains part of the receiver variance. The sharp increase in the sender variance is more difficult to explain. Although it is not uncommon to find an increase in variance estimates in models with several random effects (Snijders and Bosker, 1994), the higher estimate for the sender variance of the final model shows that the covariates do not succeed in explaining the sender effects. We tried to add to the final model other explanatory variables for the sender effect, but did not find any significant ones. The increase in variance shows that taking into account the other explanatory variables introduces greater differences between associates seeking advice. Apparently other characteristics of the associates (that we do not know, and that are not directly related to the dimensions of formal structure retained here) also determine the advice seeking relationship.

Another possible, more statistical, explanation of the rise in sender variance is sensitivity of the p_2 model to 'extreme' outcomes, where extreme means with very high or very low probability according to the estimated model. In the final model, the large positive effects of office similarity and specialty similarity make advice relationships among associates with different specialty working in different offices highly unlikely. The occurrence of a few such unlikely relationships may then be reflected by a higher sender variance. It is also possible that the non-linearity of the logistic link function is one of the reasons for this increase in estimated variance.

The receiver variance is reduced in comparison with the empty model. The level of seniority explains part of the differences in the sender parameters of the associates. The covariance between sender and receiver parameters still shows a considerable amount of negative correlation: the tendency of advice seeking is negatively related to the tendency of advice giving.

Examples of the effect of the variables on the probabilities of the four different dyad outcomes are inferred from the model while ignoring random effects. This means that these are expected probabilities for an 'average' associate with the characteristics taken into account in the model. They are provided in Table 3 for associates of the first two levels of seniority.

Table 3
Expected dyad probabilities of advice relationships of associates with seniority Levels 1 and 2.
(0.0) (0,1)
(1,0) (1,1)

	Seniority level	Same office				Different office			
		1		2		1		2	
Same specialty	1	0.08	0.11	0.34	0.28	0.58	0.14	0.83	0.12
		0.11	0.70	0.08	0.30	0.14	0.14	0.03	0.02
	2	0.34	0.08	0.14	0.13	0.83	0.03	0.68	0.12
		0.28	0.30	0.13	0.60	0.12	0.02	0.12	0.08
Different specialty	1	0.52	0.15	0.80	0.13	0.91	0.04	0.96	0.03
		0.15	0.18	0.04	0.03	0.04	0.01	0.01	0.00
	2	0.80	0.04	0.63	0.13	0.96	0.01	0.93	0.03
		0.13	0.03	0.13	0.11	0.03	0.00	0.03	0.01

Table 3 demonstrates the strong effect of similarities and differences of seniority, office membership and specialty on advice seeking behavior. It shows that two senior associates similar in terms of office and specialty have 70% chances to have a reciprocal advice relationship with one another, 22% chances to have a one-way relationship and 8% chances not to have an advice relationship either way. Between senior associates and associates of seniority Level 2, chances of a reciprocal relationship drop sharply to 30%, chances of a one-way relationship increase to $28 + 8 = 36\%$ and chances not to have advice relationships whatsoever increase to 34%. Among themselves, seniority Level 2 associates also similar in terms of office and specialty have 60% chances to have a reciprocal advice relationship with one another, 26% chances to have a one-way relationship and 14% chances not to have an advice relationship whatsoever. But their chances of seeking advice from senior associates are higher than the other way around: 28% versus 8%. Even associates very close in terms of seniority levels, specialty and office membership do play Blau-type (1964) status games with each other when they have advice relations.

A sharp contrast in this latter respect appears between associates who work in different offices and different specialties. In terms of advice relationship, they almost live in two different worlds. Even among senior associates, two persons have now a virtually zero chance to have a reciprocal advice relationship with one another, 8% chance to have a one-way relationship and 91% chance not to have an advice relationship whatsoever. This trend increases when differences in levels of seniority are introduced. Chances not to have an advice relationship whatsoever are now 96%. For instance a senior litigation associate in Office 1 is almost entirely unlikely to seek advice from a senior corporate associate in another office, and even more unlikely if the latter is in a lower level of seniority.

To summarize the substantive findings, the strongest effects of dimensions of formal structure on advice interactions are density effects, especially similarity in terms of office, specialty and seniority. This model shows that associates tend to seek advice from other associates in the same office, in the same specialty and from more senior associates. We know that there is some reciprocity in advice relationships (positive estimate of ρ), but this cannot be explained further with the dimensions of formal structure retained here. [3] Associates are very unlikely to seek advice from someone more junior (i.e. for a shorter time with the firm, or below them in the letterhead). The seniority rule is strong. We do not have any significant indication that some associates seek out more advice than others. For instance corporate associates do not seek more or less advice than litigation associates. Finally, it turns out that gender and lawschool are not important for the explanation of any of the effects among associates. In other words, some dimensions of the formal structure such as office membership, specialty and seniority level have a very strong effect on advice seeking behavior, while more personal attributes do not.

[3] One would have to look for other determinants of reciprocity, such as different personal characteristics or ones related to the dyad and its history as reflected in other available sociometric data like friendship and cowork (Lazega, 1992b).

4.3. Partners' choices of advisors

Table 4 presents the results of the analysis of choices of advisors by partners. It shows that neither receiver variables nor reciprocity variables have any significant effect on these choices.

The most important attribute variable is the seniority of the sender. The effect for top seniority is negative: senior partners in general seek less advice than medium seniority and junior partners. Seniority similarity is also significant as a density variable, which means that partners similar in terms of seniority tend to seek advice from each other. But medium seniority partners exchange less advice among themselves than junior partners do. Seniority similarity has a differential effect within the three levels: the senior as well as the junior partners seek more advice among themselves (effect size 0.52 on the logit scale), but the medium seniority partners seek less advice among themselves (total effect size $0.52 - 1.10 = -0.58$). This difference in advice seeking between medium seniority partners and junior partners is interesting. It confirms that the longer one stays in the organization, the less one seeks advice. Perhaps because with experience one does not need as much advice as one used to, but also because this is part of the status game. Similarity with respect to office as a density variable is strong too: advice ties exist more between partners in the same office than in partners in different offices. The same is true with partners in the same specialty. Corporate partners seek more advice from other corporate partners than from litigation partners; the same homophilous tendency is true for litigation partners. Including receiver and reciprocity effects did not improve the model. Advice relationships among partners are therefore best explained in terms of density and sender parameters, i.e. the general level of exchange of advice and advice seeking.

In comparison with the empty model, the sender variance σ_A^2 and covariance σ_{AB} have decreased, but the receiver variance σ_B^2 has increased. This implies that unknown characteristics of the partners play a role in the advice giving process (our covariates related to the formal structure do not succeed in explaining this). The covariance between sender and receiver parameters is now close to zero, indicating a small or no correlation between giving advice and asking for advice.

Table 4
P_2 estimates of partners' choices (standard errors in brackets)

	Parameter	Empty model	Final model
Sender	Variance σ_A^2	0.86 (0.17)	0.82 (0.17)
	Seniority Level 1		−1.39 (0.35)
Receiver	Variance σ_B^2	0.66 (0.13)	0.82 (0.17)
Sender–receiver	Covariance σ_{AB}	−0.43 (0.12)	−0.16 (0.12)
Density	μ	−1.40 (0.17)	−1.90 (0.27)
	Similarity seniority		0.52 (0.19)
	Similarity partner Level 2		−1.10 (0.36)
	Similarity office		1.29 (0.15)
	Similarity specialty		0.79 (0.13)
Reciprocity	ρ	1.69 (0.20)	1.25 (0.22)

Table 5
Expected dyad probabilities of partners' advice relationships.
(0,0) (0,1)
(1,0) (1,1)

	Seniority level	Same office						Different office					
		1		2		3		1		2		3	
Same specialty	1	0.35	0.17	0.27	0.32	0.27	0.32	0.75	0.10	0.67	0.22	0.67	0.22
		0.17	0.31	0.08	0.33	0.08	0.33	0.10	0.05	0.05	0.06	0.05	0.06
	2	0.27	0.08	0.26	0.17	0.27	0.32	0.67	0.05	0.68	0.12	0.67	0.22
		0.32	0.33	0.17	0.40	0.08	0.33	0.22	0.06	0.12	0.08	0.05	0.06
	3	0.27	0.08	0.27	0.08	0.04	0.09	0.67	0.05	0.67	0.05	0.26	0.17
		0.32	0.33	0.32	0.33	0.09	0.78	0.22	0.06	0.22	0.06	0.17	0.40
Different specialty	1	0.61	0.14	0.52	0.28	0.52	0.28	0.87	0.06	0.83	0.12	0.83	0.12
		0.14	0.11	0.07	0.13	0.07	0.13	0.06	0.01	0.03	0.02	0.03	0.02
	2	0.52	0.07	0.52	0.16	0.52	0.28	0.83	0.03	0.84	0.07	0.83	0.12
		0.28	0.13	0.16	0.16	0.07	0.13	0.12	0.02	0.07	0.02	0.03	0.02
	3	0.52	0.07	0.52	0.07	0.13	0.15	0.83	0.03	0.83	0.03	0.58	0.15
		0.28	0.13	0.28	0.13	0.15	0.57	0.12	0.02	0.12	0.02	0.15	0.12

Examples of the effect of the variables on the probabilities of dyad outcomes for an 'average' partner are provided in Table 5 for partners of the three levels of seniority. The strong effects of similarities and differences in seniority, similarities in office membership and specialty, already observed above and also among associates, are thus expressed in a useful way. For instance, Table 5 shows that senior partners working in the same office and the same specialty have 31% chances to have a reciprocal advice relationship with one another, 34% chances of having a one-way advice relationship and 35% chances of not having an advice relationship whatsoever. The latter figure reflects the above-mentioned difference between partners and associates: the former seek less advice than the latter. Furthermore, among partners, the chances of having reciprocal advice ties increase when seniority decreases (note that highest seniority rank corresponds to the lowest label, 1): it increases from 31% for senior partners, to 40% for medium seniority partners, to 78% among junior partners. Chances for senior partners of being sought out for advice by medium seniority partners and by junior partners are almost twice as high (32%) than the chances of being sought out by fellow senior partners (17%).

Again, a sharp contrast appears between such figures and the chances of having advice ties between partners in different offices and different specialties. Senior partners in Offices 1 and 2 ignore each other almost entirely (in terms of advice relationships). There is 87% chances that they will never seek advice across office and specialty boundary. Just like associates, they almost live in two different worlds. This decreases somewhat among medium seniority partners (84%), and much more among junior partners (58%). A senior and a medium seniority partner have a close to zero chance of having a reciprocal advice relationship with another senior or medium seniority partner

from the 'other side', and 12 to 15% chances to have a one-way advice tie; the same chances for junior partners are 12% and 30%. Note that these differences are due more to office differences than to specialty differences.

In summary, the strongest effect of formal structure on advice interactions among partners is sender seniority: senior partners seek less advice than anyone else in the firm. Then, as for associates, come density effects, especially seniority superiority, seniority similarity, office similarity and specialty similarity. Thus, the difference with associates is the heavier effect of seniority among partners: they are even less likely than associates to seek advice from other partners who have been for a shorter time with the firm, or who are below them in the letterhead. An iron law of seniority seems to emerge here. Here also, we do not have any significant indication that partners from one specialty seek out more advice than partners from another. Here too, gender and lawschool are not important for the explanation of any of the effects among partners (but note that there were only three women partners out of 36 at the time of the study).

The influence of formal structure on advice interactions is not very different in nature for partners and for associates. It is different in the relative strength of the effects. Seniority comes first among partners, and office and specialty comes first among associates. But we should keep in mind that these dimensions of formal structure explain advice seeking by partners better than their advice giving, whereas the advice giving by associates is better explained than their advice seeking. Looking at the same effects at the firm-wide level, i.e. including all attorneys in the firm, brings more information regarding these differences, and helps in completing the picture.

4.4. Choices of advisors at the firm-wide level

Table 6 presents the model for both partners and associates. Including other sender, receiver, density and reciprocity effects did not improve the model.

It is interesting to note that office, specialty, gender and lawschool still do not have a

Table 6
P_2 estimates of all lawyers' choices (standard errors in brackets)

	Parameter	Empty model	Final model
Sender	Variance σ_A^2	0.58 (0.08)	0.75 (0.11)
	Partner seniority Level 1		−0.92 (0.30)
Receiver	Variance σ_B^2	0.76 (0.10)	0.49 (0.08)
	Associate seniority level		−0.50 (0.06)
Sender–receiver	Covariance σ_{AB}	−0.25 (0.07)	−0.05 (0.06)
Density	μ	−1.87 (0.12)	−3.98 (0.22)
	Similarity status		0.89 (0.22)
	Similarity seniority associate		0.98 (0.19)
	Superiority seniority		−0.29 (0.11)
	Similarity office		1.79 (0.11)
	Similarity specialty		1.60 (0.12)
	Similarity gender		0.29 (0.11)
	Similarity lawschool		0.20 (0.09)
Reciprocity	ρ	1.42 (0.13)	1.46 (0.25)
	Similarity specialty		−0.81 (0.28)

significant effect on advice seeking at the overall level. Members of one office do not seek advice more than members of another office, members of one specialty not more than members of another, women not more or less than men. The only strong and significant effect is status of top partners who seek advice less than attorneys below them (in terms of seniority). As for the receiver effect, it shows that associates are sought out for advice much less than partners. Again, office, specialty or gender do not have a significant effect on the fact of being sought out for advice. Members of one office are not significantly sought out for advice than members of another office, members of one specialty not less than members of another, women not less or more than men. Not surprisingly, this confirms that, in this firm, advice seeking is asymmetric because it is very sensitive to status: one does not ask for advice from people below.

Given this constraint of status, the density effects show that general activity in the advice network tends to be significantly higher among people similar in terms of various characteristics than among people different in terms of those characteristics. Thus, advice relationships exist more between people in the same office than between people in different offices, between people similar in terms of specialty than between people of different specialty (two strongest effects) and also between people similar in terms of status than between people of different status. Among these similarity effects, the strongest are office, specialty and status in decreasing order. For associates, a strong effect of being in the same cohort comes in. But note that weaker but significant density effects emerge here at the firm-wide level: lawyers of same gender and same lawschool do exchange more advice with one another than lawyers different with regard to these characteristics. The negative reciprocity effect of similarity specialty indicates that the 'unexplained' reciprocity between advice relationships of lawyers with the same specialty is smaller than between advice relationships of lawyers with different specialties. This implies that the probability to have a reciprocal advice relationship is less strong although the probabilities of having a one-way advice relationship are still larger than for lawyers with different specialties. Examples of the effect of the variables on the probabilities of dyad outcomes are provided in Table 7(a) and (b) for senior partners, medium seniority partners, senior associates and second level seniority associates. It is important to notice that, consistent with Ibarra (1992a) and despite the existence of few women partners, gender as well as lawschool attended emerge as significant density effects when the whole population is taken into account, i.e. when status differences become even stronger than within each subpopulation considered separately. Overall, chances for senior partners to have reciprocal ties among themselves are 21% (because senior partners ask less for advice anyway), and this increases to 48% for medium seniority partners, to 63% for senior associates and then decreases for associates of lower level. Even in the same office and same specialty, partners almost never seek associates for advice. A senior partner has a 3% probability of asking a second level associate for advice, even in the same specialty and office. This drops to zero when they are not in the same office and specialty. These figures confirm the results observed previously for associates and partners separately and also show the expected difference between relationships from partners to associates and vice versa. The probability of having an advice relationship goes slightly up for lawyers similar in terms of gender and lawschool attended.

Table 7
Expected dyad probabilities of advice relationships of partners with seniority Levels 1 and 2 with associates with seniority Levels 1 and 2 with different gender and from different lawschools.
(0,0) (0,1)
(1,0) (1,1)

	Seniority level	Partner				Associate			
		1		2		1		2	
(a) Same office and same specialty									
Partner	1	0.37	0.21	0.22	0.39	0.50	0.38	0.53	0.39
		0.21	0.21	0.09	0.30	0.05	0.07	0.03	0.05
	2	0.22	0.09	0.14	0.19	0.43	0.41	0.48	0.35
		0.39	0.30	0.19	0.48	0.11	0.15	0.07	0.10
Associate	1	0.50	0.05	0.43	0.11	0.07	0.15	0.33	0.30
		0.38	0.07	0.31	0.15	0.15	0.63	0.12	0.25
	2	0.53	0.03	0.48	0.07	0.33	0.12	0.14	0.19
		0.39	0.05	0.35	0.10	0.30	0.25	0.19	0.48
(b) Different office and different specialty									
Partner	1	0.96	0.02	0.93	0.06	0.97	0.03	0.97	0.03
		0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	2	0.93	0.01	0.91	0.04	0.97	0.03	0.97	0.03
		0.06	0.00	0.04	0.01	0.00	0.00	0.00	0.00
Associate	1	0.97	0.00	0.97	0.00	0.86	0.06	0.95	0.04
		0.03	0.00	0.03	0.00	0.06	0.02	0.01	0.00
	2	0.97	0.00	0.97	0.00	0.95	0.01	0.91	0.04
		0.03	0.00	0.03	0.00	0.04	0.00	0.04	0.01

These effects are consistent with the massive influence of status observed above, but they contain an important additional indication. At the overall level, there are less non-significant or absent density effects than in the previous models. This is due to the larger data set we analyzed, but also indicates that the other dimensions help members in mitigating the severity of this 'iron law of status and seniority'. Members can still play on similarities in terms of office, specialty, gender and lawschool attended in order to bypass the status and seniority rule.

4.5. *Formal structure, competition and cooperation*

To summarize, the p_2 model shows the extent to which selected dimensions of formal structure of the firm, as well as personal characteristics of members, weigh on interactions related to advice. In this firm, the struggle for access to a resource such as advice is strongly constrained by the use of formal identities. The formal structure of this collegial firm exercises, via all sorts of status games, a strong control over the circulation of flows of ideas and intelligence. Use of various other attributes and derived

similarities is also important, but less widespread. Advice seeking tends to go upward. As a way to mitigate or neutralize such status games, reciprocal exchanges tend to happen much more within formal boundaries such as office and specialty boundaries. For instance, in this firm, litigators have a significantly higher probability of choosing advisors among other litigators rather than among corporate lawyers; a similar trend is observed among the latter. With specialty, members can play on the content of the advice being sought. They can also use similarity in office membership to seek advice from more junior persons in the same office. Such choices mitigate the severity of status. These exchanges seem to rely also, but to a much lesser extent, on homophily based on personal characteristics such as gender or lawschool attended, i.e. characteristics defined from outside the firm. [4]

In this case, many reasons may explain these asymmetries in the flows of advice, and the weight of status and seniority. Senior lawyers may have more experience than junior ones. Thus the longer you are in the firm, the more people come to you for advice (receiver), and the less you ask for advice. But the importance of status may also be related to the nature of advice as a resource. Advice can include many contents which are not always predictable in advance. It often happens that advisors reformulate or reframe the question asked by advice-seekers, who thus may find themselves in a situation of 'meta-ignorance' (Smithson, 1985, Lazega, 1992a). In such conditions of uncertainty about the question itself, the latter may include a quest for approval and legitimacy. Given this dimension of advice-seeking behavior, it makes sense for some actors to let face-saving status games or considerations of accountability (i.e. covering themselves) guide their own advice-seeking behavior. In addition, advisors too are aware of the fact that questions submitted to them are sometimes controversial and may raise tricky issues of confidentiality.

Another reason for members to be sensitive to such formal dimensions of structure, which is more specific to the functioning of law firms of this type, is that advice relationships are perceived to be different from simple coworkers relationships. Advice is not billed to the advice-seeker. It does not show in lawyers' time sheets or in firm accounts. Advisors cannot claim credit in successful cases. Lawyers who want to be able to claim their share of the credit must become coworkers on the case, which is accepted only beyond a certain contribution, or negotiated with the lawyers already in charge. It is difficult to predict unilaterally when advice may become collaboration.

As seen above, seeking advice in such a context of business, career and symbolic competition can be a delicate operation. Mobilizing identities and similarities in terms of several attributes may thus be perceived to be a useful mitigating device by advice seekers of any rank. Other mechanisms that we have not quantified here (and therefore included in the 'random' part of the model) operate as well. For instance, with much sought-out and selective advisors, other personalized access and multiplex ties may help advice seekers in stretching advice as much as possible before it becomes collaboration. But multiplex ties do not exist among all the members of the organization, particularly

[4] However, from the variances observed, we know that there must be other important personal characteristics which were not taken into account in these models.

beyond a certain size. In this firm, as in many others, the advice network is less dense than the coworkers network (Lazega, 1992b).

Striking a fragile balance between cooperation and competition by playing with the (unspoken) social rules of status mitigation tends to be tolerated less for some associates than for others (Lazega, 1995). For instance, associates exchange more advice within their own cohort than with others. They need each other for advice, but they also tend to be rivals in their relationships with partners. This is particularly true for the members of the first levels of associate seniority who were supposed, at the time of the fieldwork, to come up for partnership in the next 2 years. Competition for the attention of partners can require different strategies. Associates may try to reduce the number of situations in which the members of other levels will get a chance to show their capacity to provide advice, for instance by insulating them in compartmentalized domains defined by traditional and formal internal boundaries. Paradoxically, lateral or 'foreign' (from another office) associates may both let themselves be used more often, and be perceived to be easier to exploit or less threatening in terms of loss of status for the advice seeker.

It should therefore not be too surprising that such strategies (use of status and of mitigating similarities) also characterize partners' advice seeking behavior, even when they do not have direct economic incentives to withhold advice and let other partners down (which is the case in this firm). Partners compete for the best associates and for prestige within and outside the firm. Recall that we did find a reciprocity effect for partners, but no variables to explain it.

Thus, dimensions of formal structure and formal identity claims have a much stronger influence on the choices of advisors than personal characteristics. The former indirectly provide some members with more or better access to advice; this in turn helps them in dealing with strong or diffuse competition. The extent to which such symbolic keys give a structural advantage to some competitors (associates in the race for partnership, for instance) requires the use of other methods where the individual remains the unit of analysis. The analysis of the relationship between identities and resources presented here helps describing a context in which advice seeking is constrained in terms of efficiency, but also of control and internal politics. Although exchange of advice often justifies the existence of such firms, actors' strategies at different levels often orientate these flows and structure a 'market' for advice in a specific way.

5. Conclusion

The p_2 model is particularly well suited for studying the relationship between formal structure, identity claims and control of resources. It connects important parameters determining a two-way binary relationship between two actors (sender, receiver, density and reciprocity) to characteristics of the individual actors. At the same time it allows for (individual) deviations from the expected effect of these characteristics by the use of random effects and associated variances and covariance. In this paper, we show that specific similarities, as differentiated from specific sender or receiver characteristics, drive interactions, although covariates that we do not know (perhaps psychological or other personal characteristics) may be important in view of the sender and receiver

variances. Thus the dependence between relations from and to the same actor is accounted for and quantified. The p_2 model in principle assumes complete network data. For the estimation method, however, this assumption is not necessary, and missing values on the relations do not limit the application of the p_2 model.

Actor variables can be used in the p_2 model in various ways in the construction of covariates to explain the dyadic relations. They can be incorporated as sender or receiver effects, but also transformed to similarity or superiority variables. It is also possible to use 'essentially' dyadic variables that are not derived from actor variables, e.g. the length of time that two persons have known each other. Dyadic covariates can explain the existence of relations, but may also explain the degree of reciprocity (such as in this research having the same specialty).

The estimation method, however, is approximative: non-linear functions of binary variables are linearized and then approximated with a normal distribution. It seems that the model selection process (based on the usual test statistic such as t-tests or likelihood ratio tests) is sensitive to this approximative nature of the p_2 model. Therefore models should be selected very carefully, and theoretical and substantive insights are needed to guide the model selection process.

Our substantive results support our claim that the p_2 model helps in developing a new approach to the theory of the relationship between dimensions of formal structure and the struggle for resources in organizations. In this text, we followed the (unequal) struggle between formal organizational characteristics, on the one hand, and personal attributes, on the other hand, as keys for access to and exchange of advice. We find that access to this resource is extremely controlled in a type of organization which is sometimes considered a 'flexible' organization (Eccles and Crane, 1987). So much so that, to some extent, members sometimes come to think of a piece of information as advice because it comes from a formally authorized (in terms of status) source. Some structural constraints on identity claims might be heavier than others for the flow of a particular resource, but lighter than others for the flow of another resource. p_2 helps disentangle these effects in a way well suited to the type of data collected by network analysts. Therefore, it helps both in showing how members design strategies to manage competition and cooperation in their work environment, and to describe the nature of the relationship between structure and collective action.

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