“Being important” or “Knowing the Important”: who is best placed to influence policy?

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Abstract:

Those wishing to influence policy and practice often aim to identify key individuals with whom to connect. For example, researchers may wish to connect with brokers on the edge of the policy world who can speak for them in policy discussions, or they may wish to identify political or professional opinion leaders and influence them directly. Network analysis offers a robust analytical approach to identifying these influential individuals. One way to do this is to ask people to nominate key players. However, reputational approaches may be subject to recall bias, incomplete, or otherwise unreliable. This subjectivity and partiality is unlikely to be randomly distributed, however. Being able to accurately identify other powerful and influential actors may be a characteristic of powerful and influential actors. Previous work suggests that those with an accurate picture of the social network are both more likely to be influential, and better able to manipulate network structure. Hubs and Authorities offers a way to identify (a) those who are agreed to be powerful and influential and (b) those who are good at identifying these Authorities. Using Hubs and Authorities captures centrality in directed networks in an intuitively appealing manner. In this paper, I explore Hubs and Authorities measures in a policy network of 225 nodes. Findings indicate that most people who are good at identifying Authorities are not themselves considered important. However, there is a small overlap between the Hubs and Authorities, consisting of two-to-three mid-level managers. I explore possible interpretations of these results using qualitative interviews of the same network members, in which they discuss the nature of power, influence, and network structure. Finally, I discuss implications for evidence use and particularly network interventions aiming to increase evidence use.

Introduction: the importance of key players for evidence-use

Those wishing to influence policy and practice are often advised to work through intermediaries (Bednarek et al., 2016; Farrell et al., 2019; Ward, 2017). This is because they are better placed to understand and influence the machinery of the policy process (Oliver et al., 2013), hold credibility with decision-makers (Cvitanovic et al., 2016) and/or maintain relationships in both evidence-producing and evidence-using communities (Oliver & Faul, 2018). For example, researchers may wish to connect with brokers on the edge of the policy world who can speak for them in policy discussions, or they may wish to identify political or professional opinion leaders and influence them directly.

But how should researchers attempt to do this? It would be a pity if significant efforts were directed to building relationships with people who, ultimately, were not influential or able to change policy or practice. How can researchers be sure they are connecting with the right people?

Much has been written about what makes a person a “key player” in a network or community (Ballester et al., 2006; Borgatti, 2006; Long et al., 2013). For some political scientists, power is seen as a resource or a possession—something which is bestowed on an individual by virtue of holding certain characteristics (being male or wealthy, for example) or roles (holding an executive position, or being a clinician) (Coleman, 1988; Dahl, 1961). Here, power is largely defined as authority (executive responsibility), which cannot be delegated and is connected with decision-making bodies and roles.

Small-world and leadership studies draw on this definition of power, which tends to explain power through the possession of sets of personal characteristics (Brass, 1984; Cronin, 2011; Strauss, 1962).

However, others view power and influence as broader concepts than merely a set of ranking criteria. Lukes argues that we should not just look at which decisions are made and by whom, but at the other faces of power: decisions not made, how agendas are set and reinforced, and how debates and issues are themselves framed (Lukes, 1974). Here, power is conceptualised as a dominating force, or at least as a relational one (Morriss, 2006). If one approaches power as an enacted interaction, we can begin to imagine power in terms of strategies, rather than characteristics. As Scott argues, "social power is a form of causation that has its effect in and through social *relations* (Isaac, 1992, see also Isaac, 1987)." *(*Scott, 2001). Increasingly, researchers have emphasized the importance of interactions between actors, rather than actor attributes, to explain both formal and informal types of power (Balkundi & Kilduff, 2005; Freeman, 1991).

French and Raven (1956) listed sources of social power as: capacity to coerce, ability to reward, incumbency in a position of authority, recognized expertise, and referent power (esteem or charisma) (French, J. & Raven, 1956) . These relate to ideas concerning leadership, such as charismatic leadership (Weber, 2002); described as a "gift" of personality, in the context of a religious leader, with "a mission believed to be embodied in him." Its success depends on followers having faith in a leader (Bryman, 1992). While described in a religious context this phenomenon can clearly also apply in political leadership. This has been applied to more everyday settings, in Scott's description of "office charisma.", where "any occupant of a particular position must have certain personal qualities and such an occupant may therefore, be able to demand a degree of personal allegiance." In terms of making health policy, the personality and credibility of a leader may affect policy content and success.

Moving beyond questions of personality and character, Treadway described how political skill allows people to achieve influence by "combin[ing] social astuteness with the capacity to adjust their behavior to different and changing situational demands in a manner that appears to be sincere, inspires support and trust, and effectively influences and controls the responses of others" (Ferris et al., 2007; Treadway et al., 2011). Politically skilled individuals are therefore able to present their intentions to others, and make these intentions attractive (Treadway et al., 2011; Fiske & Taylor, 1984; Spence, 1974). Treadway describes this as "one's expertise, charisma, and goodwill" which resides in informal relationships.

For researchers wishing to influence policy and practice, this all implies that—in line with the current evidence about evidence use (Oliver and Boaz, 2019)—those who are most likely to be of use to them are those who are embedded in social processes through which policy and practice already take place. Identifying key players is not about simply looking at hierarchical organograms and emailing those at the top of the tree; rather, it is about understanding the complex web of relationships which underpin the machinery of policy (Oliver & Faul, 2018).

Use of network analysis to study power and influence

Fortunately, network analysis offers a robust analytical approach to identifying these individuals or cliques. Influence has been studied by network analysts for several decades. One way of conceptualizing power influence was proposed by Burt (1992), in his theory of structural holes. This theory suggests that individuals attain influence through bridging gaps in social communities which

others are not able to, in effect becoming the gatekeeper, or "broker" for resources (whether knowledge, information, social capital or some other asset). Gould and Fernandez (1989) take a similarly positional approach to identifying influential actors, in their typology of brokerage structures. This describes five structures, or types of relationships, which indicate that individual actors are in a position to "broker" assets. One can then analyze a social network to identify how frequently these structures appear, or how frequently actors are part of these structures. To analyze transactional networks, such as financial exchange, these microstructures are useful to explore social interactions. For more intangible assets, such as social capital, trust, and influence, however, these measures are very vulnerable to both missing data, and to variation in how these properties are viewed and attributed by network members. How should one use structural measures to analyze relationships which may be interpreted differently by network members?

One approach is to use reputational approaches to collect perceptions about powerful actors (Lewis, 2006; Pfeffer & Salancik, 1974). Lewis carried out several network studies using both positional and reputational approaches to test the hypothesis that the high status of the medical profession in health policy-making has declined, and to unpack patterns of connectedness between influential individuals and groups, and their personal and positional resources. Lewis concluded that structurally it appeared that medicine was not formally represented in power networks, but when individual ties were examined using scores for homophily, centrality, and betweenness, clinicians were central to informal networks influencing health policy Lewis, 2006). Such reputational measures assume that those asked are knowledgeable about power, that they are willing to divulge what they know, and that the process of asking does not create the phenomenon (e.g., in that it might make people rank their acquaintances for the first time) (Pfeffer, 1981). Although such measures have been criticized (Kadushin, 1968) they have shown high agreement across informants and have correlated with other indicators of power (Pfeffer & Salancik, 1974; Pfeffer, 1981).

However, both power and influence are in part, attributed properties; people cannot be powerful in a vacuum, but rely on others accepting and validating their position. When considering reputational networks, there are methodological issues to consider. Most rely on asking individuals (known as egos) to nominate others (known as alters) within their social network. Reputational approaches in general may be subject to recall bias, assume that respondents are knowledgeable about who is powerful/influential/a source of information, assume that respondents will answer exhaustively and truthfully, and finally that the act of asking does not create the relationship in the respondent's mind (Tichy et al., 1979). Asking people to nominate influential alters, for example, is an inherently subjective, interpretive exercise. People's opinions will differ; people will have partial understandings of the domains which alters are trying to influence, and may or may not have a realistic view of what it takes. They may nominate only those they know, or those they wish to be connected to. This subjectivity and partiality is unlikely to be randomly distributed, however. Being able to accurately identify other powerful and influential actors may be a characteristic of powerful and influential actors. However, some research suggests that dominant actors tend to have better recall and a greater knowledge of the network than peripheral actors (Freeman et al., 1988; Krackhardt, 1990) although there is conflicting evidence about this. Previous measures have shown high levels of agreement between participants, however, and have also been correlated with other indicators of power (Krackhardt, 1990).

To summarize, many researchers (substantive and methodological) wish to identify influential members of networks. This would be especially beneficial for those concerned with evidence use in policy and practice, because many researchers have only a partial understanding of the social communities they are aiming to influence. Previous work suggests that those with an accurate picture of the social network are both more likely to be influential, and better able to manipulate network structure. The challenge is to explain both the mechanisms by which a network exerts a structural effect on an individuals' behavior or views, and the likely strength and predictability of such an effect (Marsden, 1983). These assume that social proximity equate to social influence, an idea which has its roots in psychology and behavioral studies (e.g., Simmel, 1898).

Hubs and Authorities

Taking alters' connections into account is a helpful way of bridging the theoretical gap between individual and whole network-level measures described by Cook (1983). Hubs and Authorities scores are a type of centrality measure, derived from eigenvector centrality, where each node has a centrality which is determined by the whole network structure. Hubs and Authorities analysis takes this one step further as a natural generalisation of eigenvector centrality. Two scores are generated using an iterative updating procedure for each node. Each node is assigned an initial authority weight (A_i) and an initial Hub weight (H_i). The vector of all Authority weights is denoted by $A = (a_1, a_2, a_3, \ldots a_n)$ and the vector of all Hub weights by $H = (h_1, h_2, h_3, \ldots h_n)$. These vectors are set originally at 1, and re-calculated after applying operations $A = A^t h$ and $H = Aa$. The scores are then normalized, and the procedure is repeated. After a sufficient number of iterations, the vectors converge to the principal eigenvectors of matrices A^tA and AA^t (Kleinberg, 1999).

Using Hubs and Authorities captures centrality in directed networks in an intuitively appealing manner. Power and influence are both reputed and attributed social properties; one cannot be influential if alone. These measures described above present an interesting potential development for the power and influence literature. Hubs and Authorities centrality identifies both 'those everyone thinks are important' (the Authorities) and 'those who know everyone' (Hubs) arguably as important in policy-making as the latter, for understanding how power operates in their community. By separating "knowledge of important actors" from "recognized as an important actors" we can start to think about power and influence as an attributed property (like centrality, or being male) and as a strategic ability to identify the right people to influence. To our knowledge, Hubs and Authorities has not yet been used on social data. Eigenvectors and derived measures are vulnerable to missing data, perhaps explaining this surprising gap.

In essence, this calculation allows us to "weight" the votes of those who are more knowledgeable about social structure. In turn, this offers a way to skew the analysis in favor of those with more accurate insight into social structures. I use this approach to explore the following questions:

- Who is good at identifying important actors? (i.e. who are the Hubs?)
- Are any of these people also important? (Are any Hubs also Authorities?)
- How do these individuals exert power?

Methods:

I draw on survey and interview data from a multi-modal (power, influence and evidence use) network of 225 policy and research actors in a large urban area in the United Kingdom, (Oliver 2012). The network data was drawn from a survey of 152 individuals working on public health in a large city in the United Kingdom. The city included ten local authorities (LA), one umbrella authority, and ten National Health Service (NHS) trusts, with one regional public health authority). Using three waves of snowballing sampling, respondents were asked to identify influential and powerful alters (up to seven), and those who were sources of evidence and information for public health policymaking. Interviews were up to one hour, semi-structured and recorded, transcribed, and analyzed using a thematic approach.

Hubs and Authorities analysis produces two scores for each node for each network, between -1 and 1. The Authorities scores were calculated and those actors scoring the highest in each category were listed. To show the range of values and actors identified, the top twenty Authorities for each network have been shown here. Each network is clearly dominated by a small set of actors who score very highly, after which the values tail off rapidly. A cut-off point was decided for each network to identify this set of actors (marked in blue); where possible, this was imposed where there was a relatively large step down in values. However, as this is an arbitrary decision, these scores were treated as indicative rather than definitional.

Complementing these data, I use accounts from semi-structured interviews with network members, which aimed to gather respondents' reasons for nominations, their definitions of powerful and influential actors, and the characteristics of power and influence. Qualitative data were collated into frameworks and summarized in text and tabular form in each section for convenience. Where appropriate, illustrative quotes have been added to clarify or support a conclusion drawn in the text.

To preserve anonymity of respondents, I have given network members and interviewees pseudonyms corresponding with their sex, and an indicative label consisting of their sector (health, local authority), level (chief executive; mid-level manager).

Results:

One hundred and fifty-two actors were contacted to take part in the survey. Responses were received from 123 actors (response rate 80.90%). Twenty-six actors declined, four left their jobs, and 14 were unreachable. Seventy-five responses were useable (participation rate 49%). The sample was split between National Health Service and related originations (33%), local authorities (36%), voluntary and third sector (10%) and intelligence/evidence-producing organizations (17%) (see Table 1). Reponses were evenly split between executives in the NHS and local authority, with a similar number of responses received from academics and researchers. Nearly half the academics (or around a quarter of the overall sample) sampled or nominated were clinically-trained. Fifty-eight percent of the sample were male, with public health professionals having the smallest proportion of males. Job types found within the whole network sample are described in Table 1.

Table 1

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Characteristics of network sample

Job type	*% male*	*% medics*	*Total (%)*
Public health professional	39%	68%	31 (14)

Other types of clinicians	83%	100%	6 (3)
NHS Executive or Director	62%	23%	26 (12)
Public health intelligence staff	69%	6%	16 (7)
Council Executive or Councillor	76%	9%	33 (15)
Managers, officers, other staff	52%	6%	50 (22)
Academic or researcher	61%	44%	36 (16)
Charity director	42%	0%	12 (5)
Central government staff/MP	62%	15%	13 (6)
Unknown	0%	0%	2 (1)
Total	58%	26%	225

In total, the power network comprises 171 nodes (51 respondents, 171 nominations in total of 40 actors), and the influence network 262 nodes (61 respondents, 229 nominations in total of 131 actors). Of those, the most frequently-nominated included: the regional statutory authority for public health, two chief executives from local authorities (none from NHS trusts), two of the ten possible local Directors of Public Health—officers tasked locally with delivering public health policy, and three policy managers.

Who are the important actors, and how do we know them?

The Authorities analysis for the power network is highly clustered, identifying only five main actors, with a lower-scoring second set of actors (mainly public health professionals) appearing before a rapid decline in values. Similarly, the influence network is dominated by seven actors. There is a high degree of overlap between the network Authorities, although the influence network includes more mid-level managers as authorities, and fewer executives. For ease of interpretation, Table 2 presents indegree, Authority status (i.e., over the threshold) and executive position for the key actors in each network.

Table 2: Characteristics of Authorities

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Actor	*Job type*	*In-degree (power/influence)*	*Power Authority*	*Influence Authority*	*Executive Position*
Emma	Director of Public Health	22/19	x	x	x
Alistair	Policy manager, NHS	18/15	x	x	
Pat	Director of Public Health	14/12	x	x	
Arthur	Chief Executive, LA	13/5	x		x
Patrick	Chief Executive, LA	8/6	x	x	x
Evan	Policy manager, NHS	4/7		x	
Heidi	Director of Public Health	6/6		x	
David	Policy manager, LA	3/5		x	

What this tells us is that most of the Power Authorities identify individuals who correspond to traditional interpretations of power in the literature; those who are directly responsible and accountable for the activity of an organization, and often explicitly defined in terms of characteristics of powerful individuals—having access to more opportunities, having budgets at their disposal, being

recognized by other senior political leaders.. They included key decision-making bodies as Chief executives, or as managers, including Emma, who was

> [the[professional leader for public health in Greater Manchester, by virtue of the fact of her being the Director of Public Health for the North West. And there is, you know, a lot of deference and due respect to Emma for that reason. (Alistair, policy manager, NHS).

Key actors were also described as having personal characteristics such as being charismatic, credible, or sensible. Terms such as "gravitas" and "charisma" were often used to describe influential and powerful actors. This personal aspect of policy-making seemed to be both a characteristic of powerful people—in the sense of forceful people being able to drive things forward—and of exerting influence:

> The Chief exec previously… was very influential, very influential because she had a particularly controlling style of being a chief exec… she had quite significant … because of having some control over what went to board meetings, the format in which it was presented, even perhaps reinterpreting the way that decisions had been or the outcome of decisions and reinterpreting them in a particular way that it was a different outcome. (Charlie, council manager)

In addition to holding formal exeucitve positions and having particular personal characteristics, power and influence could also be a associated with particular, and particularly effective, ways of working. Sam, an ex-academic and NHS adjunct, described mid-level managers as channelling influence, specifically naming three policy managers: Alistair, Evan, and David. Their influence was expressed in the sense that "policies would happen." Alistair (the second ranked Authority for both power and influence) managed a regular meeting of all local Directors of Public Health. He instituted a more formalised monthly meeting for the ten DsPH across the conurbation and linked them to other important organizations across the conurbation. Alistair's influence was therefore attributed to his role within this inter-organisational network, and because of his gate-keeping role with regard to the DsPH and other public health experts. His power and influence was of a different order from the DsPH. He was not "at their elevated level" but did successfully "corral them" (Archie, policy manager, local authority). As John, a DPH explained:

> I suppose each of the ten DPHs in their own lead area, erm would have a degree, a degree of power. They end up carrying out [the work] through Alistair though (John, DPH, medic)

Similarly, an NHS manager was described influential because of his personal style and abilities:

> And somebody like Evan is a pivot. Evan works with all the groups in the Association of Greater Manchester PCTs… so he… has this astonishingly adept diplomatic manner… Something's happened recently and I said to him you should be in the FCO [Foreign Office]. And he's really good at assessing, engaging, what will… get us through to where we want to get to. Now, I think some of that is… clearly an individual matter, but I don't think it's all. It's all that, you know, in any kind of organisation or group you have people who do that kind of stuff…. I'm just full of admiration for how he handles it all.(Ada, DPH)

Powerful and influential actors (Authorities), were therefore formally holders of executive roles, personally seen to be forceful or charismatic, or able to connect important organizations through skilful management.

Who can accurately identify the important actors?

The Hubs analysis identified a different set of people from the Authorities analysis, mainly middle managers in the NHS and local authorities.

Table 3

Power Hubs

Actor	Job type	Sector	Medic	Power Hubs score
James	Policy manager	LA		0.288
Noah	Evidence-producer	NHS-assoc		0.286
Thomas	Public health professional	NHS/LA		0.281
Evan	Policy manager	NHS		0.279
Luke	Public health professional	NHS	x	0.276
Daniel	Public health professional	NHS/LA		0.238
Archie	Policy manager	LA		0.234
Maria	Public health professional	NHS		0.229
Madison	Evidence-producer	NHS-assoc	x	0.227
Alistair	Policy manager	NHS-assoc		0.198

Table 4

Influence Hubs

Actor	Job type	Sector	Medic	Influence Hubs score
Evan	Policy manager	NHS		0.402
Alistair	Policy manager	NHS-assoc		0.309
Arthur	Chief Executive	NHS		0.256
Oliver	Public health professional	NHS/LA	x	0.240
Madison	Evidence-producer	NHS-assoc	x	0.217
Judy	Evidence-producer	Uni		0.214
Daniel	Public health professional	NHS/LA		0.211
Charlie	Policy manager	LA		0.211

Policy managers were a significant group in the Hubs analyses. This group carried out tasks such as finding information, drafting of reports and presentations, and being general "go-to" person for public health. One described himself and his colleagues as:

> A bunch of figures in an entrepreneurial role people who don't have any formal power, but they are given a mandate to do stuff… what they have to try and do is bring different constituencies together and encourage people to do something that might benefit the organisation, but might not benefit another organisation. (Charlie, council manager)

Personal and professional characteristics- of a different type than for powerful Authorities- were also described for this group, such as being able to chair a meeting effectively, being able to ask awkward questions, or helping a group "reach a decision." This was put down to just "being pleasant, sometimes." (Charlie, manager) which could perhaps be understood as having good diplomatic skills.

These Hubs describe the powerful and influential in insightful terms. Powerful people were potentially influential, if they "acted like a leader" and were forceful, or had strong personalities. One manager described his perception of power and influence as being:

> …based on myths about people's effectiveness and behaviour in stories…Your influence and your reputation - that's affected by how sociable or… well, you can prove yourself to be effective in different ways. Some of that is just might just be a balance sheet, or a set of outcomes, indicators, but I don't reckon it really is often. I reckon it's more whether you come across as credible and people, as I say, I think it's like your stories that get passed round organisations. (Charlie, council manager)

In this context, reputation and stories about actors become both proof of and predictors for an actor's influence. This aspect of leadership and decision-making was not always seen in a positive light, however—perhaps particularly by those who felt or were less powerful. One actor, not identified as a power or influence Authority, and clearly not involved in major decision-making, despite being in a potentially influential role, felt that:

> "You get key players, it's like any team, you get the alpha and beta types, you get leaders, natural leaders, come to the fore, and they're not always the most expected or the most desirable, frankly… There's a massive underlying agenda which is around personality and power (Matthew, ex-manager, NHS)."

Hubs, therefore, are individuals able to identify powerful and influential actors, and in some cases, possess the managerial and personal skills to manage and work with these individuals effectively to achieve policy change. For both successful and unsuccessful Hubs, personality and character were felt to be important aspects of the influencing process.

Power through agency or structure?

3 individuals, all mid-level managers, were consistently identified as both Hubs and Authorities: Alistair, Evan and David. As previously described (Oliver et al., 2013), these actors used four main strategies to influence the public health policy process, including controlling decision-making organizations, controlling policy content, managing policy makers directly, and using network structures. They were all involved in the creation and manipulation of governance structures, providing policy content, building leadership support around their proposals, and controlling meetings as decision-making arenas. Being close to powerful groups allowed individual managers to exert a range of influences, including writing the agenda for the meetings, providing policy content, and providing experts to attend the meetings. This clearly allowed power to be exerted in an operational sense, through directly filtering what business is done by the decision-makers (particularly for the first three strategies.)

What of the fourth strategy: Using network structures? Being able to recognise and create important relational ties, and to maximise the use of those ties in achieving policy goals. This was explicitly

discussed by those in bridging roles, predominantly the policy managers, who frequently discussed their roles in terms of relationships, building up or cultivating relationships and even defining roles for external actors:

> Me, Alistair and Evan, we're running this place, in the core group… we know where power centres are, we know how far to nudge, we know how to attach an idea to [his chief exec}… that'll make her look good in AGMA [the Association of Greater Manchester Authorities] Chief Execs' [meeting]. (David, Council Officer)

The strategies used by the policy managers all required skills in relational working to be effective. Charlie described his job as bringing people together to try and have a conversation, or to work out relationships between different parts of the policy machinery and facilitate those. Archie also described his job as making links between people, facilitating conversations between different groups, acknowledging that this made him influential. Another Hub also explained her role in relational terms:

> We can't just sit in an office and dream things up… I think a lot of people forget that that's how things work in the real world, is through relationships and it does take time to build relationships, to build trust, and so you know, reorganisations that lose lots of people mean you just have to start all over again because that is how it, that is how the world works, that's how you get things done.

However, not all actors agreed that relational working was a good thing. Several actors voiced concerns that this way of doing things could seem manipulative or underhanded. One Director of Public Health claimed to be influenced only by the "strength of an idea," actively rejecting the idea that relational working was important. Others in the network described him as a liability likely to bring a policy proposal into disrepute. When this was followed up, participants who described him in this sense explained that he was unable to present effectively, could not command respect and so was not influential—despite clearly being well-informed and intelligent. Perhaps he was less influential precisely because he did not grasp the importance of interpersonal relationships.

Whether palatable or not, both the qualitative and network data suggest that those able to identify, mobilise and use ties are well-placed to wield influence and power across the machinery of policy. Alistair articulated this clearly:

> The third category of… influence is people who make the system work. And that's why, so I would have, you know, people like Evan as central to the… relationship. He… doesn't have any power invested in him as a as an individual, um and he doesn't have any accountability as such because he's accountable to other people but he, and I would myself, put myself in this category as well, we just try and make the system work… if there wasn't some of those fixed points in this system er such as Evan and myself and others I'm not sure that you know… that the system would hang together very effectively.…

Conclusions:

Researchers can struggle to identify influential actors in organizations who can help them influence policy and practice. Hubs and Authorities analyzes (alongside other network measures) can help us identify both those widely considered to be influential, and those good at spotting important people. This study suggests that the former (Authorities) should only be engaged with if they are also Hubs who have a better understanding of the policy machinery and the network structure surrounding it.

Hubs and Authorities identified overlapping but different sets of actors. Authorities were mostly those identified as key players through standard centrality measures. Hubs were mainly not identified as powerful and influential. Power in the literature is said to be associated with holding particular positions in important organizations, or having access to particular expertise (such as clinical training). Holding executive roles did not appear to be connected with being powerful or influential. Although some were nominated, their importance appeared to be due to personal style, reputation or skills.

Bonacich centrality identifies those with advantageous network connections; but Hubs and Authorities measures move beyond this as a proxy measure of how good people are at describing their social context, not just benefitting from it.

Individuals high in power generally possess greater communication and relational skills and are more skilled at relationship building (Krackhardt, 1990; Krackhardt & Hanson, 1993; Mehra, 2001).

As conceived by Burt and Lukes, power is the control of a desirable resource (Lukes, 1974) and an actor gains power by being a required intermediate (Burt, 2003), whereby powerful actors attempt to increase other's dependence on them.

There has been a long debate over whether network perception is a characteristic of powerful actors or not (Krackhardt, 1990; Simpson & Borch, 2005; Oh, 2008). Some connect being influential with having a good understanding of one's own network position. Contrary to this however, Simpson et al. suggest that network perception is more accurate in those with less power (Simpson & Borch, 2005). This study suggests that those with more accurate perception of social structure were not more powerful in general, but an accurate perception of the informal influence network can itself be a base of power in the organization (Krackhardt, 1990) and can facilitate the leader's ability to forge successful coalitions (Janicik, 2005). The study extends these insights to hypothesize that the accuracy of network perception is indeed higher in those without formal authority (mainly the Hubs) but that these actors can nevertheless be more influential in policy networks.

For the set of individuals identified as both Hubs and Authorities—that is, commonly recognized as powerful and influential, and as being good at identifying those who others agreed were powerful and influential—these policy managers were characterized as being good at relationships; maintaining relationships, identifying important connections and creating them. This relates to the theme about exerting influence requiring specific skills in managing people—identifying powerful people, and then using softer skills to corral them into a position. This corresponds largely with the literature on power, particularly work on social power by Scott (2001), which distinguishes between formal and informal power, and work on political skills by Treadway and Fiske.(Fiske & Taylor, 1984; Scott, 2001; Treadway et al., 2011. They wielded power not through inherent qualifications or position—rather through other people's perceptions of them, and their use of interpersonal and political knowledge which (a) helped them to achieve and (b) exploit these brokerage positions. Merely being a Hub does not guarantee influence over powerful actors; accurate identification of these individuals does not necessarily

correspond to being able to influence them. A combination of ability to recognize important relationships, and the skills to build and exploit those relationships appears to be important.

For researchers, the lesson here is to connect with those who act in these roles. We can hypothesize that people such as Alistair, David, and Evan are essential to the effective functioning of any policy community (certainly, this was their estimation). Researchers would be well-advised, if this is true, to try and identify these individuals rather than building relationships with the Authority-type individuals, who may not share the skills and interests in relationship building. However, they should be aware that in general, the academics in this data set did not share the common perceptions of others about the network structure. One peripheral academic made a few mistakes about who people worked for, identifying the council leader as the Chief Executive, or working for the wrong borough, for example. The same actor identified a senior academic as influential because “he's sort of got one foot in both camps so he's an academic but he's also very involved in you know local policy”—and yet no one else nominated him at all, indicating that this perception was not shared by actors from the policy world. If researchers are not able to build accurate mental maps of the policy communities they are trying to influence, they are unlikely to succeed.

Another lesson which researchers may wish to take from this study concerns the fact that policy managers had no public health expertise and yet were considered influential. One possible explanation for this is that public health policy is a false construction; public health may be just one part of the whole body of public policy. The policy managers may have been influential in this wider body of policy, and therefore, by default, also influential here. This would in turn mean that the influence of DsPH outside public health policy may be less. Again, this implies that researchers would be better off working through those who have social networks in place and have strategies to build and maintain networks.

Limitations:

Hubs and Authorities measures are vulnerable to missing data, like all eigenvector-derived measures. However, both sets of measures were calculated after removal of non-respondents. Of the top Authorities, Emma and Patrick declined to respond, and Heidi explained that individuals were not important; nominating just Pat (as the chair for the GM Directors of Public Health group, on which they both sat). This means that none of these actors were nominated as Hubs; although we cannot comment on the accuracy of their mental maps of the community. Similarly, some (although not all) dislike describing themselves as powerful or influential, false modesty which may skew the analysis.

In addition, the point at which the cut-offs were applied for both the Hubs and Authorities scores was a judgement, and the resulting top sets of actors should not be interpreted as an actual coterie of actors. To avoid over-emphasizing this cut-off, the results for each set have been discussed in the light of the top twenty actors, with especial reference to the dominating top set, rather than using the set as a unit of analysis. The scores are indicative rather than definitive and should be read as such. However, the inclusion of David as an influence Authority and Alistair as a power Hub are both worth mentioning. As they are both policy managers, and their scores were at the lowest end of the top set, the narrative about the dominance of the policy managers may have given extra weight to the decision to include them in this “top set.” However, there was a step down in the scores subsequent to theirs. This could be seen as a case where the network and qualitative data were used in conjunction to support a hypothesis in the other, rather than as data manipulation.

Those actors fresh in people's memory may be most likely to be nominated, and as always there is a risk of recall bias. Power and influence are both problematic concepts in themselves. Respondents interpreted influence as "is influential," "influences me," "influences the system"—and probably in more diverse ways. Some people described "influence" as a way of effecting change; other answered the literal question posed, which was "influences my views." For this reason, the definitions and characteristics of powerful and influential people were analyzed together, with similarities and differences highlighted. This is perhaps reflected in the common comment that people found "doing the survey hard or challenging." However, by comparing the qualitative and network data some of these definitions were pulled out. The core group were well known, and consistently nominated. Some studies suggest that their answers will be more accurate (Krackhardt & Hanson, 1993). As there is a high consistency amongst answers in the core, this adds strength to the network findings despite the relatively low response rate (Grannis, 2009).

Finally, the most common application for Hubs and Authorities, and indeed what it was designed for, is the ranking of webpages. Implications?

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