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# Can We Measure Social Capital in Academia?

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## Introduction

*Can we measure social capital*? Ask any social scientist and there is rarely a definitive answer Tzanakis (2013) and Engbers et al. (2017) agree that as a concept, it is extremely difficult to measure, and Claridge (2017) claims that the demand for relevant empirical measures has continued to outstrip supply. Still, measures have been developed; often based on social network theory and Social Network Analysis (SNA) as an approach (e.g., Abbasi et al., 2011).

According to Neuman (2000), a social network is "a collection of people, each of whom is acquainted with some subset of the others. A network [could thus] be represented as a set of points (or vertices) denoting people, joined in pairs by lines (or edges) denoting acquaintances" (p. 404). This view of social capital provides a formal, tangible view of network ties and configurations between people (i.e., the *structural dimension*). Earlier, emphasis was placed on shared understandings between persons in a network (the *cognitive dimension*), as well as expectations, obligations, identities, and trust (the *relational dimension*) (i.e., Bourdieu, 1986; Putnam, 1995)

Most of the social capital research in academia has been about contracts between industry and universities (e.g., Al-Tabbaa & Ankra) and networked coauthorship patterns between researchers (e.g., Li et al., 2013). A SNA approach to measuring social capital shows, in general, that researchers holding a favorable position in a collaborative network, tend to obtain further gains (e.g., Takeda et al., 2010). The downside is that for every network structure showing well-positioned collaborators, there can be structural evidence of exclusion (Walker & Boamah, 2019). Academics therefore understand that social capital is worth thinking about, because it can be a significant precursor to success (Abbasi et al., 2011).

In this paper, we ask if social capital in academia can be measured. Despite evidence that it can be, more attention has been given to networks and/or *outcomes* of social capital, and not enough to *antecedents*. Little is known about what scholars think about whilst cultivating social capital for collaborative research. Studies have been done to investigate motives for collaboration (e.g., Whitley, 2000), proclivities in collaboration (e.g., Iglič et al., 2017), and collaborative choices (e.g. Van Rijnsoever & Hessels, 2011). Our research lies at the intersection between social capital and collaboration research, in that we are investigating which social capital dimensions individuals *prefer* - i.e., *cognitively*, *relationally*, and *structurally* - when collaborating and publishing.

The survey-questionnaire method that we use is similar to that of Martín-Alcázar et al. (2019), but we focus on individuals, not on "how social capital affects internal processes and the performance of research teams" (Martín-Alcázar et al., 2019, p. 919). We are motivated by two questions: 1) *To what extent do academics from different research disciplines engage in similar collaboration habits,* and 2) *which dimensions of social capital do they prefer when collaborating on research?*

**Method**

This study originated with a population of *n*=7,480 academics working at the University of Copenhagen (UCPH), Denmark. A manual search was carried out for the academics' names and email addresses (i.e., *PhD students, Postdocs, Assistant, Associate, and Full Professors, Visiting Scholars*) via the university's departmental websites and recorded in an Excel file.

*SurveyXact* (Rambøll, 2021) was used as our online questionnaire development tool. The first part consisted of five demographic questions (e.g., what is your: gender, age group, department, faculty, etc.). The second part was comprised of seven questions about collaboration habits. Each item was worded as a statement (e.g., *I collaborate and publish research with people.... e.g., from the same department*) and asked respondents to indicate on a 5-point rating scale, a frequency level ranging from: *1. Never, 2. Rarely, 3. Sometimes, 4. Often,* and *5. Always.* The third part of the questionnaire focused on *preferences* with regards to collaboration. We distinguish *habits* from *preferences* based on the view that an academic's actual behaviours or *habits* as a collaborator may not not necessarily be what he/she/they *prefer(s)*. 27 new statements were prepared, beginning with the intitial statement: "*I prefer to collaborate and publish with people ....*" Here, respondents were asked to indicate on a 7-point Likert scale, a level of agreement ranging from: *1. Strongly disagree, 2. Disagree, 3. Somewhat disagree, 4. Neutral, 5. Somewhat agree, 6. Agree*, and *7. Strongly agree.*

In the survey itself, the 27 'preference' questions were presented at random. Initially, they were created to reflect, in order, three dimensions of social capital - 1) *cognitive*, 2) *relational*, or 3) *structural* (Nahapiet & Ghoshal, 1998).

An email message with a link to the online questionnaire was sent on the 6th of April, 2021 to 7,480 UCPH academics. An emailed reminder was sent on the 14th of April 2021. The survey was closed for submissions on the 26th of April 2021. A total of 1,635 respondents entered the *SurveyXact* link, and 1,094 actually completed all questions. Two responses were ineligible, thus removed from the final dataset and this resulted in a final response rate of 15% at *n*=1,092.

Table 1: Response rates and percentages per UCPH Faculty

| Faculty | | Faculty Population | Survey Response Rate Per Faculty | Percentage of Faculty Population |
|---|---|---|---|---|
| | Health & Medical Sciences | 2,993 | 383 | 13% |
| | Humanities | 881 | 142 | 16% |
| | Law | 199 | 32 | 16% |
| | Science | 2,747 | 449 | 16% |
| | Social Sciences | 514 | 65 | 13% |
| | Theology | 119 | 21 | 18% |
| Total | | 7,453 | 1,092 | 15% |

## Preliminary Results

Figure 1: Collaboration habits across six UCPH faculties: Health and Medical Sciences, Humanities, Law, Science, Social Sciences, and Theology.

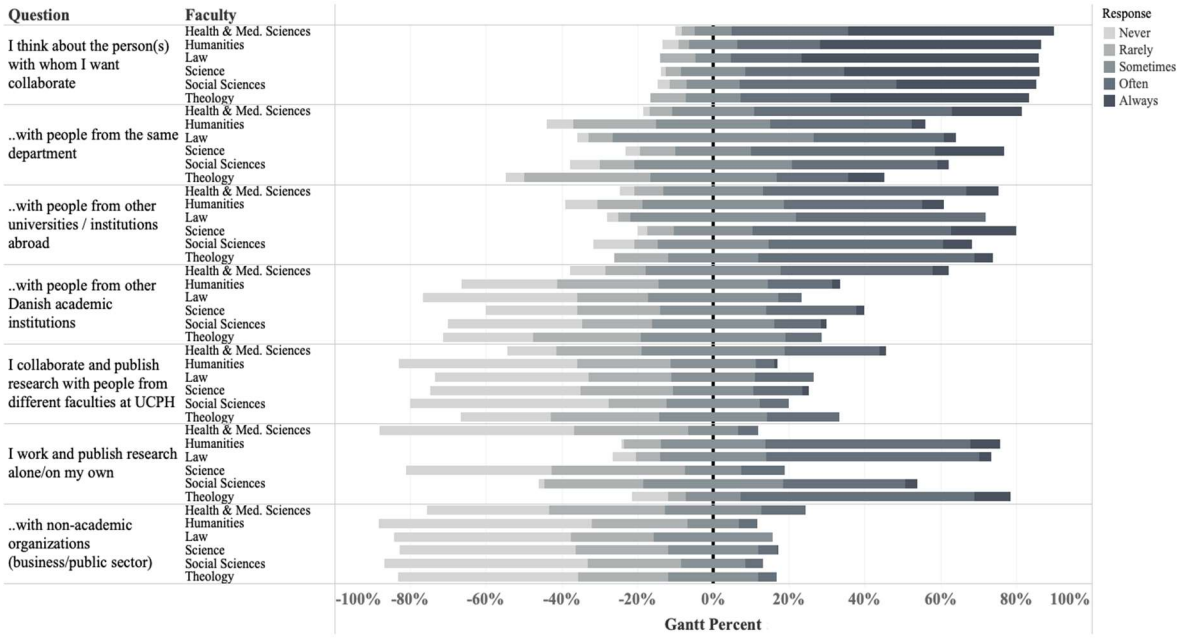


Figure 1, above, shows the differences in collaboration habits across the six UCPH Faculties. The Gantt percentage marks along the horizontal axes illustrate where negative (i.e., *rarely* to *never*) to positive (i.e., *often* to *always*) response tendencies lie, with the response '*sometimes*' divided at the 0% mark.

In part 3 of the questionnaire, we refer to and measure social capital in terms of '*preferences*'. Here we have implemented an exploratory principal components analysis to validate the questionnaire dimensions, as well as a Chronbach's alpha test of reliability.

Figure 2: Scree plot with two inflections, justifying 3 to 4 components.

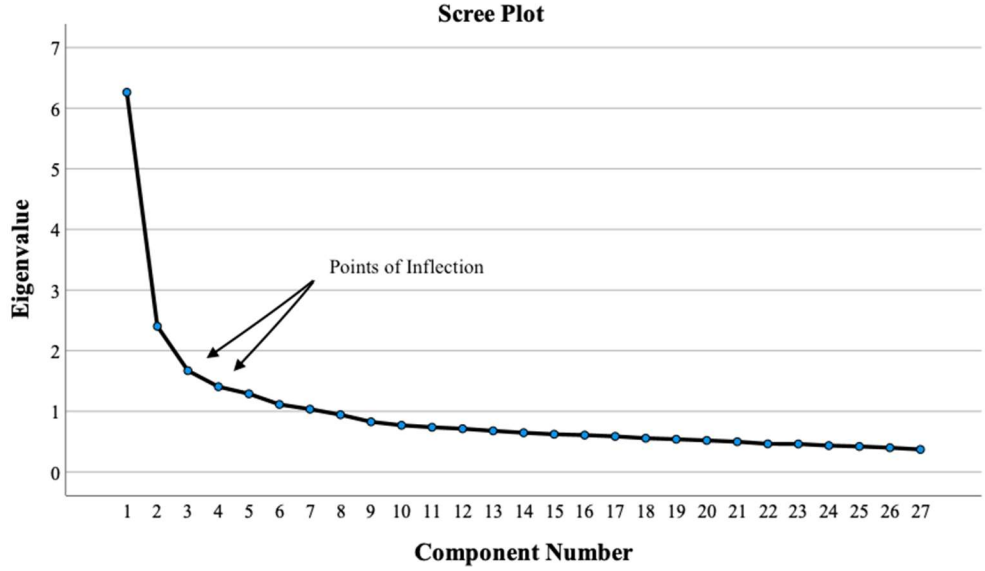

Figure 2, above, shows the scree plot and Table 2 shows the factor loadings for the 27 questionnaire items (varimax rotation). The Kaiser-Meyer-Olkin measure verified sampling adequacy (KMO = .881). Bartlett's test of sphericity $X^2(351) = 7774.86$, $p < .001$ indicates that correlations between the items were sufficiently large for a principal components analysis. The scree plot shows inflections that would justify retaining 3 to 4 components.

A Chronbach's alpha test for the Likert-scale questions about preferences resulted in a range of acceptable to uncertain values. The subscale for the *cognitive* dimension of social capital consisted of 10 items (α =0.712), the second subscale for the *relational* dimension of social capital also consisted of 10 items (α =0.736), and the third subscale for the *structural* dimension of social capital consisted of 7 items (α =0.638). Results also indicated that slight improvements to these alpha values would be obtained by removing questions 8 (from the *cognitive* subscale), 18 and 21 (from the *relational* subscale) and 23 (from the *structural* subscale).

Table 2: Factor loadings and % of variance for a three-factor principal component analysis with varimax rotation.

| | | Component | | |
|---|---|---|---|---|
| Item | Questionnaire Item: *I prefer to collaborate and publish with people....* | Cognitive-Relational | Cognitive-Structural | Structural-Relational |
| Q02 | who share the same attitudes and beliefs about research | 0.675 | | |
| Q12 | who share my ambitions for the research project | 0.654 | | |
| Q11 | who have the same perspective on conducting research as me | 0.649 | | |
| Q05 | who agree with me on the paradigm for the given research project | 0.597 | | |
| Q04 | who share my expectations of work productivity | 0.579 | | |
| Q20 | who share the same vision as me | 0.557 | | |
| Q06 | who prioritize the process of working and interacting together | 0.54 | 0.388 | |
| Q15 | who are available to provide/receive feedback | 0.531 | 0.403 | |
| Q07 | who are in regular contact with me about our research project | 0.519 | | |
| Q16 | who I know are effective and get the work done | 0.504 | | |
| Q09 | who I can work closely with on joint tasks | 0.474 | | |
| Q01 | with whom I can share and exchange knowledge | 0.448 | 0.383 | |
| Q18 | who I know will comply with our deadlines | 0.437 | 0.325 | |
| Q17 | whose compentencies I trust will make the research easier | 0.35 | | 0.331 |
| Q03 | who allow us to take advantage of our different expertise(s) | | 0.632 | |
| Q21 | who bring resources from a research community different from mine | | 0.631 | |
| Q14 | who take a different approach to research than me | | 0.612 | |
| Q10 | who challenge my understandings and beliefs | | 0.578 | |
| Q26 | who come from a different academic background than me | | 0.573 | |
| Q25 | who have had more experience with research than me | | | 0.638 |
| Q22 | who are top researchers in their field | | | 0.59 |
| Q24 | who will increase my citation rate and have a positive effet on my h-index | | | 0.577 |
| Q19 | with whom I have previously worked | | | 0.522 |
| Q23 | who are similar to me and my research | 0.346 | | 0.482 |
| Q27 | who allow me to become part of a networked community of researchers | | 0.368 | 0.428 |
| Q13 | whom I know well | 0.345 | | 0.417 |
| Q08 | who produce a good final result, thus it is less important how they work | | | 0.267 |
| | Eigenvalues | 6.26 | 2.40 | 1.67 |
| | Total variance explained (%) | 17.25 | 11.44 | 9.60 |
| | Cumulative variance explained (%) | 17.26 | 28.69 | 38.29 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 6 iterations.

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