Measuring Meaningful Data in Social Research

Geert Loosveldt, Marc Swyngedouw and Bart Cambré (eds.)
Design and Evaluation of a Web Survey for Social Network Data

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1. Introduction

The study reported in this chapter is part of a project carried out by the INSOC (International Network on Social Capital and Performance http://srecserv.agent belinsoc/insoc.htm) research group, in which researchers of Ghent University (Belgium), University of Ljubljana (Slovenia), University of Girona (Spain), and University of Giessen (Germany) took part. The aim of the INSOC project is to develop models predicting the PhD students' academic performance.

The performance was measured by the publications and conference papers of PhD students during the last three years. Explanatory variables included the characteristics of PhD students' research groups, which are understood as social networks, and background and attitudinal characteristics of PhD students.

A web survey was designed including all these variables in Belgium, Slovenia and Spain, (while in Germany, a paper and pencil mail survey was used). Questionnaires including social network measurements have been rarely administered via a web survey. Evidence about quality of these measurements is promising but extremely scarce (Koren et al., 2003; Lozar Manfreda et al., 2004; Coromina & Coenders, 2006).


This chapter presents the design of the web survey used for the project in Spain and Slovenia and the analyses of the survey quality, which includes satisfaction of
the respondents with several aspects of the questionnaire, response rates, and questionnaire completion times.

2. Performance in knowledge intensive jobs and their predictors

In the literature, performance in knowledge intensive jobs has been predicted using mainly three types of variables: personal background, attitudes and social networks, albeit normally using only one of the types at a time.

The first group of authors studied performance stressing the role of background variables such as education, experience or age, also called human capital by Hitt et al. (2001), Becker (1964), or stocks of knowledge by Smith et al. (2005).

Another group of authors analyzed the role of attitudinal variables such as group atmosphere, job satisfaction or job motivation. Although not all these variables may fit into the strict psychological definition of attitude, they have in common the fact that they refer to subjective states of the respondent. For ease of reading, we include all of them in the attitudinal label. For instance, Nonaka (1991) exposed the importance of group atmosphere. Simon (1985) studied motivation and Riketta (2002) commitment.

More recently, a third group of authors focused on the role of social network relationships, including management of group relations, trust and communication among social network members, individual network position indicators such as centrality or closeness, and global network measures such as density or centralization (Wasserman & Faust, 1994). The basic idea behind this perspective is that an individual's success is strongly dependent on the ties that the person has with relevant others inside and outside the organization (Burt, 1992). The formal social relations (organigram), as well as informal ones (e.g. friendship) are captured by the concept 'social capital', which could be defined as the amount of social resources individuals have, given by the number of relations, the density of the network and the heterogeneity of their contacts (Lin, 1990), Burt (1982; 1992) and Burt and Minor (1983) defined the importance of an individual in the network by the number of contacts he/she has. Nahapiet and Ghoshal (1998) and Hansen (2002) argued that social relations are a good indicator for the flow of new knowledge. Sparrowe et al. (2001) studied the influence of centrality in the advice networks on group performance. Mehra et al. (2001) related the centrality of actors with the performance in the workplace. Rosenthal (1997) stressed the importance of personal networks for the team performance.

However, the three types of variables have rarely been used together. Authors who did (Collins et al., 2001; Smith et al., 2005) suggested that all three types of variables are important to explain the performance. This combination was used for the prediction of the PhD students' performance in the INSOC project.

The background variables used in the INSOC project represent the amount of knowledge or background in the group (Smith et al., 2005) and are related to:
- Personal characteristics (e.g. age, gender);
- Educational career (e.g. degree, grades' average);
- Experience (e.g. seniority);
- Knowledge diversity (e.g. field of study).

The attitudinal variables used are:
- The recalled reasons to start a PhD, including motivation for autonomy (Gulbrandsen, 2004) or identification with the researcher's job (Pierce & Delbecq, 1977).
- The PhD students' perception of their relationship with supervisors (Deschrijver et al., 2001).
- Perceived integration of the PhD thesis within the research group tradition.
- Perceived atmosphere in the research group (Cook et al.; Nonaka, 1991).
- Attitudes towards publishing (Deschrijver et al., 2001).
- Attitudes towards work (Cook et al., 1981; Furnham, 1997).
- Satisfaction at work (Cook et al., 1981; Furnham, 1997).

The social network variables included in the INSOC questionnaire draw from the literature about different types of networks in the organizational context (Krackhardt & Hanson, 1993; De Lange, 2005; De Lange et al., 2004; Sparrowe et al., 2001; Waege & Agneessens, 2001; Glaeser et al., 2000). These are:
- Scientific advice;
- Collaboration;
- Getting crucial information;
- Trust;
- Getting along well;
- Socializing;
- Emotional support.

Summarizing, a large number of different types of variables is needed to predict academic performance, which may result in a high response burden and thus in low response rates and low respondent satisfaction, unless the questionnaire is carefully designed.
3. Web survey design and data collection

Data for the INSOC project were obtained by a web survey. The reasons for using a web survey instead of other data collection modes such as face-to-face or telephone are explained in this section.

Web surveys have already proved to be a valid and reliable survey method for classic survey questionnaires (Couper, 2000; Dillman, 2000; Vehovar et al., 2002). This data collection mode is especially well suited for questionnaires including social network questions, which can be considered as sensitive and complex to answer.

Self-administered questionnaires produce a better data quality for sensitive questions (Comley, 2002; Dillman, 2000; Tourangeau & Smith, 1998). Using web administration, some complexity due to the social network questions can be avoided, which makes the questionnaire less burdensome. For example, the list of the relevant alters in a network that has been reported in a previous question can appear in questions asking about the ties with these alters. A research group member that the respondent does not know does not appear in any further question.

3.1. Population and coverage

Web surveys also have their disadvantages. The main one is the coverage error, as there is no census of the internet users and only respondents with internet access can be sampled. However, coverage was not a problem in our case because the list of the PhD students was known. They all used the computer on a daily basis for their job and had fast internet connections.

The population studied in this comparative analysis is composed of PhD students who began their doctoral studies at the University of Girona (Spain) and at different universities and research institutes in Slovenia in the academic years 1999/2000 and 2000/2001. In addition, these PhD students were required to have an official link with their universities. Most of them (all of them in Slovenia) had grants, the rest being assistant professors or research assistants hired for particular research projects. This choice has been made because these PhD students have frequent contact with other researchers (they more or less formally belong to a research group), and they can spend a lot of time doing research as their main job. Because of the relatively small population size of the PhD students (N = 189 in Slovenia and N = 86 in Girona), we decided to study the complete population.

The lists of the PhD students were obtained from the administrative records of the University of Girona and the Ministry of Science, Education and Sports of the Republic of Slovenia. In Slovenia, the Ministry also provided the names of each student's supervisor. In Girona, students had to be interviewed by phone to get their names.

The members of the research group where the students and supervisors belonged to had to be identified because they were needed for the network questions. The main problem was to find a common definition of the research group for the participating universities in the INSOC project. With this purpose, each university carried out similar focus groups (Morgan, 1997; Krueger, 1998) with leading researchers of different fields of study. The aim of these focus groups was to create a common concept of the research group and to define which questions should be asked (name generators) to the supervisors in order to obtain the names of people in their research group connected to the research topic of their PhD students. The groups could coincide with an official research group recognized by the university or not. The name generators used in the INSOC project were:

- Name all the teaching assistants (or doctoral assistants) whose research is mainly under your supervision.
- Name all the researchers of whom you are formally the mentor and who work on or participate in a research project.
- Name your colleague professors, senior researchers, junior researchers or people working in the private sector with whom you substantially work together on those research projects in which PhD student X [name PhD student] is involved.

The web questionnaires, which were later administered, were personalized and included the names of the research group members.

3.2. Data collection

When the research group was defined, the web survey was administered. In Girona, respondents were students and supervisors. In Slovenia, respondents were also all research group members.

In both Girona and Slovenia, respondents first received a letter. An official envelope was used in order to enhance the credibility of the survey and prevent the e-mails from being treated as spam (Vehovar et al., 2002). Next, personalized e-mail invitations were sent to all respondents with a link to their own web questionnaire address. A different address for each respondent's questionnaire prevents
respondents from accessing the wrong survey and from completing the survey several times (De Lange, 2005: 101). In the e-mail text, there was a short introduction explaining the goal of our research, the universities that were also using the same questionnaire, and the confidentiality of the answers.

In Girona, a total of 158 e-mails with a link to web questionnaires were sent (86 questionnaires for PhD students and 72 for supervisors). In Slovenia, the total was 1365 (190 questionnaires for PhD students, 190 questionnaires for supervisors and 985 for other research group members). The questionnaires resided in a server at the University of Ghent, and were programmed using the SNAP software, Version 7 (Mercator Research Group, 2003).

3.3. Follow-ups and non-response evolution

A commonly mentioned threat to web surveys is low response rate. A follow-up design is one of the most efficient techniques to reduce the non-response rate (Schaef & Dillman, 1998; Dillman, 2000; Kaplowitz et al., 2004; De Lange, 2005) since in our project pre-paid incentives (Berk et al., 1993) were not offered. The use of mixed-mode follow-ups increases the response rate for those who are more sensitive to specific modes (De Lange, 2005). For instance, when people are not most of time connected to internet or have strong spam filters, they can still be reached by researchers through other methods (Dillman, 2000) such as telephone or mail.

At the University of Girona, a mixed-mode follow-up was chosen. The first reminder was sent by e-mail to the whole population to thank respondents and draw the attention of non-respondents. Letters and phones were used for the second and third reminders to non-respondents only. A PhD student phoned non-respondent students and non-respondent supervisors were phoned by a professor in order to increase the response rate using the liking strategy (a respondent is more willing to comply with requests from those like him, see De Lange, 2005: 18). The telephone is the most effective way to understand whether the respondents do not want to participate or they are planning to answer the questionnaire later or if they are still unaware of the request to complete the survey. In this last reminder, respondents were also offered the possibility of a face-to-face interview or a paper-and-pencil self-administered interview in what can be considered a mixed-mode questionnaire administration. Two respondents chose this alternative. Through the first reminder, we obtained an additional 12.5% of supervisor respondents and 20.9% of PhD students' respondents. Through the second and third reminders, we obtained an additional 38.9% for supervisor respondents and 22.1% for PhD students.

In Slovenia, two reminders were sent using only e-mail. After the first reminder an additional 12.2% of respondents filled out the questionnaire and after the second reminder an additional 3.8% was obtained.

<table>
<thead>
<tr>
<th></th>
<th>Response rate</th>
<th>Response rate</th>
<th>% complete</th>
<th>Number of complete student supervisor pairs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PhD Students</td>
<td>Supervisors</td>
<td>Student-supervisor pairs</td>
<td></td>
</tr>
<tr>
<td>Girona</td>
<td>78%</td>
<td>75%</td>
<td>63%</td>
<td>54</td>
</tr>
<tr>
<td>Slovenia</td>
<td>62%</td>
<td>54%</td>
<td>36%</td>
<td>68</td>
</tr>
</tbody>
</table>

The final response rates in both countries are shown in Table 1. Variations in response rates across countries such as the ones found in Table 1 are often reported in the literature on comparative research. Understanding the cause of the differences in response rates across countries is by itself an interesting cross-national research question. In our case it can be at least partly attributed to the different reminder strategies. More importantly, differences in response rates are a cause for concern, as differential non-response bias may affect the validity of group comparisons (Harkness et al., 2003).

3.4. Questionnaire

The web questionnaire design was a complex process led by Daniëlle de Lange and involved two years of discussion within the INSOC research group, several international meetings, several focus groups and pre-tests (De Lange, 2005). For this project, data were collected via web by three of the INSOC participating universities (Girona, Slovenia, and Ghent) and via mail by the University of Giessen. The fact that we had to produce comparable versions in four languages (Catalan, Flemish, Slovenian, and German) and the differences between the three university systems lengthened the process even further and involved two independent translations, a pre-test of the translated questionnaires and further discussions and modifications. Some of the survey questions were country specific, since some differences exist between universities and countries, for example, regarding research groups or the organization of doctoral studies.
Two different questionnaires were designed, one for the PhD students and another for their supervisors and other research group members, though most of the questions were asked to all. The topics of the web questionnaire identified in Section II are shown in Table 2 in the same order as the questions were asked; each topic includes several questions, which are explained in greater detail later and is classified into the background, attitudinal or social network type.

In this chapter, only the data of the PhD students and the supervisors of Girona and Slovenia are used.

<table>
<thead>
<tr>
<th>Variable type (°)</th>
<th>Supervisor and other research group members</th>
<th>PhD Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
<td>Educational career</td>
<td>Educational career</td>
</tr>
<tr>
<td>Background</td>
<td>Experience and knowledge diversity</td>
<td>Experience and knowledge diversity</td>
</tr>
<tr>
<td>Attitudinal</td>
<td>Contact with colleagues (egocentered network)</td>
<td>Contact with colleagues (egocentered network)</td>
</tr>
<tr>
<td>Network</td>
<td>Proxy measurement of the complete network (only asked in Girona)</td>
<td>Relationship with the supervisor</td>
</tr>
<tr>
<td>Attitudinal</td>
<td>Integration of the PhD thesis within the research group tradition</td>
<td>Atmosphere in the research group</td>
</tr>
<tr>
<td>Attitudinal</td>
<td>Attitudes towards publishing and towards work</td>
<td>Attitudes towards publishing</td>
</tr>
<tr>
<td>Attitudinal</td>
<td>Satisfaction at work</td>
<td>Satisfaction at work</td>
</tr>
<tr>
<td>Dependent</td>
<td>Publications and performance</td>
<td>Publications and performance</td>
</tr>
<tr>
<td>Background</td>
<td>Personal characteristics</td>
<td>Personal characteristics</td>
</tr>
<tr>
<td></td>
<td>Web survey evaluation</td>
<td>Web survey evaluation</td>
</tr>
</tbody>
</table>

**Educational career (background variable)**
The first topic was the educational career. The questions were about the year respondents started and completed their undergraduate studies and about the average mark obtained.

**Experience and knowledge diversity (background variable)**
The field of study was constructed from administrative records and from a question on the school or institute the respondent belonged to. Experience was asked as the year when the respondent was first employed at the department where he/she is currently working.

**Reasons to start a PhD (attitudinal variable)**
PHD students were asked about sixteen potential reasons for starting a PhD. As shown in Figure 1, a web questionnaire makes it possible to present all items and response scales together and makes responding or correcting a wrong response as easy as a click.

![Some potential reasons for starting a PhD are listed below. Please indicate the importance or the unimportance of these reasons in your decision to start a PhD.](image)

Figure 1. Question on reasons to start the PhD.

**Contact with colleagues (egocentered network)**
The next topic concerns social networks and social capital measured by the contacts that respondents had with research group members, that is, their ego-centered...
tered networks. Respondents were asked to give information about their relations with the same list of alters obtained through the name generator questions previously asked to the supervisor. One example of the questions (concerning collaboration in the research group) is shown in Figure 2.

Consider all situations in the past year (namely since 1 November 2002) in which you collaborated with your colleagues concerning research, e.g. working on the same project, solving problems together, etc. The occasional piece of advice does not belong to this type of collaboration. How often have you collaborated with each of your colleagues concerning research in the past year?

<table>
<thead>
<tr>
<th>Not in the past year</th>
<th>Once in the past year</th>
<th>Several times a year</th>
<th>About monthly</th>
<th>Several times a month</th>
<th>Weekly</th>
<th>Several times a week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name 1</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Name 2</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Name 3</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Name 4</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Figure 2. Example of social network question about collaboration.

The names (Name 1, Name 2, etc.) are for the actual names of the research group members. This personalized way of delivering the questionnaire made the response much easier. The questions were formulated using the guidelines of Coromina & Coenders (2006) for asking frequency of contact network questions via web: presenting all alters together for each question (instead of all questions together for each alter) and labelling all response categories. Guidelines for delivering network questions using other data collection modes can be found in Kogovščak et al. (2002) and Kogovščak and Ferligoj (2005).

Similar frequencies of contact questions were asked for scientific advice (“Consider all the work-related problems you have had in the past year and that you were unable to solve yourself. How often did you ask each of your colleagues on the following list for scientific advice?”), getting crucial information (“Consider all situations in the past year when you needed crucial information, data, software, etc., for your work but did not have it in your possession. How often did you ask each of your colleagues for information/data/software, etc., in the course of the past year?” – asked to PhD students only), and socializing (“How often did you engage in social activities outside of work with your colleagues in the past year?”).

Two extra options, namely, “I do not know this person” and “That’s me” were included only in the first question. If the respondent chose any of these two options, these names did not appear any more in the questionnaire. This could be easily done due to the fact that a web questionnaire was used and the routine of hidden empty boxes was used.

Think about all the situations in the past year that required collaboration with other people concerning research (namely since 1 November 2002). Did you collaborate with anyone in the last year besides the people in the above-mentioned list? (people from outside the university and/or from abroad can also be mentioned)

- Yes
- No

Please fill in the full name of the people besides those in the list with whom you collaborated concerning research in the past year (namely since 1 November 2002)?

<table>
<thead>
<tr>
<th>Name 1</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Name 2</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Name 3</th>
</tr>
</thead>
</table>

Figure 3. Example of name generator question.

For the networks concerning scientific advice and collaboration, respondents were asked to use name generators to include also contacts outside the research group. One example of this type of questions is shown in Figure 3. One of the advantages of a web survey is the ability to hide unnecessary questions to the respondent, as shown in Figure 3: only when respondents clicked yes, did the second question appear. Then the relationships with these additional alters were measured with the same questions as before (Figure 2).

The remaining three networks mentioned in Section II were measured as follows:
- “Imagine being confronted with serious problems at work: e.g., lack of motivation, problematic relationship with a colleague. To what extent would you discuss these problems with each of your colleagues?” This question is related to the emotional support network and used a scale from “certainty not” (1) to “certainty yes” (4).
- The question concerning the trust network used a scale from “complete distrust” (1) to “complete trust” (7). See Figure 4.
- “Sometimes colleagues at work do not get along, while others get along well. Maybe there are some colleagues you do not see eye to eye with, whereas you have a good relationship with other colleagues. How well or how badly do you get along with each of your colleagues?” This question measures the getting along well network and used a scale from “very badly” (1) to “very well” (7) and was concerned with the friendship network variable.
An example of the scientific advice network is shown in Figure 5. Having a network actor that measures relationships among third parties is known as proxy measurement.

Relationships among all research group members had to be answered by supervisors. These questions can become burdensome if large research groups exist. The structure of the question, except for the combination of group members (Name 1-Name 2), is the same as Figure 2.

**Relationship with the supervisor (attitudinal variable)**

The next topic is the relationship of PhD students with their supervisors and was of course asked to PhD students only (see Figure 6).

- **How do you experience your relationship with your promoter? Please indicate to what extent you agree or disagree with each of the following statements?**

<table>
<thead>
<tr>
<th>Completely disagree</th>
<th>Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My supervisor leaves me to my own devices</td>
<td></td>
</tr>
<tr>
<td>My supervisor gives advice concerning the development of my PhD project</td>
<td></td>
</tr>
<tr>
<td>My supervisor introduces me to other research</td>
<td></td>
</tr>
<tr>
<td>My supervisor helps me prepare my publications</td>
<td></td>
</tr>
<tr>
<td>The contacts with my supervisor are rather informal</td>
<td></td>
</tr>
<tr>
<td>My supervisor gives me enough freedom concerning the content of my PhD</td>
<td></td>
</tr>
<tr>
<td>My supervisor encourages me to attend conferences</td>
<td></td>
</tr>
<tr>
<td>My supervisor imposes his own opinion all too often</td>
<td></td>
</tr>
<tr>
<td>My supervisor determines the course of my research concerning my PhD in too much detail</td>
<td></td>
</tr>
<tr>
<td>I think of my supervisor as a very helpful person</td>
<td></td>
</tr>
<tr>
<td>My supervisor encourages me to take educational courses abroad</td>
<td></td>
</tr>
<tr>
<td>I often feel stressed when I discuss things with my supervisor</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 6.** Question on the relationship with the supervisor.

**Integration of the PhD thesis within the research group tradition (attitudinal variable)**

The next question concerns the integration of the PhD research within the research group tradition and asked only PhD students to what extent some statements applied to the PhD research (p. 249 etc., Figure 7).
Atmosphere in the research group (attitudinal variable)

The next topic concerns the atmosphere in the research groups as a whole. There was a list of characteristics that may typify the social climate in a research group formulated through semantic differential scales (Cook et al., 1981: 242-245) (Figure 8).

The following question takes into account the atmosphere of the group as a whole. Below we have listed a number of characteristics that may typify the climate in a research group. To what extent do these apply to the climate in your research group? The further to the left you tick off a box, the more you associate the atmosphere in the research group with the characteristic that is mentioned on the left. The further to the right you tick off a box, the more you associate the atmosphere in the research group with the characteristic that is mentioned on the right.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>+1</th>
<th>+2</th>
<th>+3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distrust</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Unpleasant</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Unfriendly</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Unproductive</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Not helpful</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Trust</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Pleasant</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Friendly</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Productive</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Helpful</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Figure 8. Question on atmosphere in the research group.

Attitudes towards publishing and towards work (attitudinal variable)

The next topic concerns the respondents’ attitude towards academic publishing and towards work. The attitude towards publishing questions used a response scale from “completely disagree” (1) to “completely agree” (7) and is thus similar to Figure 6. The items were:

- “Publishing is stimulating and motivating”;
- “Publishing is an important means of getting feedback”;
- “I only publish because I’m supposed to”;
- “Publishing is annoying because it is very time-consuming”;
- “Publishing is useless”.

The attitude-towards-work question was about the feeling of PhD students at work, and was asked to PhD students only. The question used a scale from “certainly not applicable” (1) to “certainly applicable” (7), similar to Figure 7. The items were:

- “Working on a PhD is a lonesome activity”;
- “I often think I lack the necessary insight in my PhD research”;
- “At the start of my PhD research, I gave myself a considerable chance of succeeding”;
- “My PhD research gives me a chance to demonstrate my creativity”;
- “My PhD research appears to be less fascinating than I expected”;
- “I feel like I’m doing meaningful work with my PhD”;
- “During my PhD research I often feel as if I am alone on an island”;
- “I often exchange views with my colleagues about my PhD research”;
- “More and more often, I get the feeling that doing a PhD is too difficult for me”.

Satisfaction at work (attitudinal variable)

The next topic concerns satisfaction with several work-related aspects. This question has the same layout and response scale as Figure 6 and the items were:

- “My job feels like a hobby to me”;
- “I enjoy my work more than my spare time”;
- “I’m often bored with my job”;
- “Most of the time I have to force myself to go to work”;
- “I definitively dislike my work”;
- “I think I’m happier in my work than most other people”;
- “I find real enjoyment in my work”;
- “I’m sorry I ever took this job”.

Publications and performance (background/dependent variable)

The next topic is performance, as measured by publications and participation at conferences. Respondents were first asked filter questions to recall if they had or not (co)authored each of the most common types of publications and conference presentations during the past three years. In the next question (Figure 9), they
were requested to provide the actual number of (co)authorships only for the types of research output for which they had answered yes in the filter question.

**Web survey evaluation**

The last part of the questionnaire included a question about how satisfied the respondent was with the web questionnaire (Figure 10).

![Figure 10](image)

**Figure 10.** Question on atmosphere in the research group.

### 4. Evaluation of the questionnaire

In this section, we focus on the survey satisfaction questions on content, length, layout, difficulty and sensitivity and compare the responses of PhD students and supervisors from Slovenia and Girona. We are especially interested in these results because the questionnaire was long, included novel lay-outs and the content of some of the questions, particularly the network questions, were complex and sensitive.

First, some descriptive analyses were done; the mean in a scale from 1 (very dissatisfied) to 7 (very satisfied) in each item is shown in Figure 11.

![Figure 11](image)

**Figure 11.** Results of the questionnaire satisfaction questions.

Given the fact that the mid point of the scale is 4, we can conclude that, as a whole, respondents were satisfied with the questionnaire, with the exception of Spanish supervisors. From the point of view of respondent satisfaction, web surveys seem to be an appropriate means for collecting network data.

All four subgroups of respondents show a similar pattern in the graph, though the satisfaction levels in the vertical axis are not equal. The difference between Girona and Slovenia supervisors was statistically significant using the Mann-Whitney tests and $\alpha = 5\%$ for all five items except contents. Using the same tests, no significant differences were found between Girona and Slovenia students. In Girona, students were significantly more satisfied than supervisors with all items ($\alpha =$
5%, Wilcoxon's test). In Slovenia, supervisors were significantly more satisfied than students with length and layout (α = 5%, Wilcoxon's test).

Respondents were most satisfied with the degree of difficulty of the questions. This high satisfaction can be due to the wording, to the respondent educational level and also the routing which hides unnecessary questions. It is really a good result because the topic of the questions was inherently complicated in itself. The second highest satisfaction regards layout, which argues for the fact that we made good use of the design options for web questionnaires. Respondents were also quite satisfied with the content, and, although this result has a rather limited methodological interest, it also supports the feasibility of asking network questions via web.

The lowest satisfaction we encountered was with the length, more so for the Girona supervisors, who had to answer proxy questions about relationships among all research group members. The fact that internet respondents are more impatient in front of the screen than paper-and-pencil respondents are in front of the paper may also have contributed to the result. If we look at the actual questionnaire completion times, we find averages of 31.5 minutes for the Girona students, 33.5 for the Slovenian students, 32.0 for supervisors in Girona and 30.5 for supervisors in Slovenia. The average completion times are all quite high and, in addition, they are surprisingly similar given the different questionnaire lengths.

In particular, completing the proxy questions properly should have taken more than the 1.5 minutes difference between Slovenian and Girona supervisors. If we carefully look at the responses to the proxy questions, which are by far the most burdensome of the questionnaire, when averaging for all three proxy questions, only 39% of the proxy relationships were reported. Moreover, when five or more people composed the network, this percentage dropped to 28%. The least reported network was "how well or badly colleagues get along with each other" for which only 27% of relationships were reported, dropping to 14% for networks composed by five or more people. Web surveys, thus, do not seem appropriate for collecting proxy network data. The duocentered network defined by Coromina et al. (in press) partially solves this problem.

The second lowest satisfaction concerned sensitivity of the questions, a critical issue for a questionnaire including questions about relationships, getting well, trust, or collaboration. Some respondents who later interacted with the researchers by mail or in person complained about having to evaluate this type of relationships with colleagues. A self-administered mode of data collection as web surveys should theoretically have partly prevented the problem, but seemingly not to a great extent.

5. Conclusion

In this chapter, an evaluation of the web survey performed by the INSOC research group in Slovenia and Spain is given. The questionnaire was a complex one and included social network questions. Only a few studies have been done to evaluate such web surveys across countries.

After the presentation of the web survey design, an evaluation of the survey quality (satisfaction of the respondents with several aspects of the questionnaire, response rates, and questionnaire completion times) is done. The results show some differences between countries in response rates: there is much higher response rate in Spain than in Slovenia. This is mainly due to the number of follow-ups (in Spain, there were three, in Slovenia only two) and the type of follow-ups (a mixed mode was used in Spain, only the e-mail mode was used in Slovenia). The conclusion is that more than two and mixed mode follow-ups should be used to obtain good response rates.

The results also show that in general, respondents were quite satisfied with the different aspects of the web survey; nevertheless, it was quite a long and complex
questionnaire. The least satisfied with all aspects were the Spanish supervisors, especially because of the length. This can be explained by the more complicated and demanding questionnaire for them. They had to evaluate proxy relationships for each pair of members in their research group. It looks that this task was too demanding for them and the data obtained were useless because of too many missing values. We do not recommend measuring proxy ties in a web survey.

To conclude, a web survey seems to be a very appropriate mode to collect complex attribute and network data.

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