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Wired attraction: effects of ICT use on social cohesion in organizational groups

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Chapter 6
Research Design

The previous chapters discussed several theories and presented a conceptual model (Figure 5.1) incorporating four hypotheses regarding the relationship between ICT use and social cohesion in organizational groups. The following chapters report the empirical results. This chapter illustrates the design of our empirical research, which explored the assumptions outlined earlier, and finally tested the four hypotheses. The results are presented in Chapters 7, 8 and 9.

Given the assumptions and hypotheses regarding the relationship between ICT use and social attraction in organizational groups, we required a research design that devoted attention to the following aspects before testing the formulated hypotheses:

- The relationship between ICT use and organizational structure;
- The assumptions regarding the social impact of CMC;
- The measurement of social cohesion in organizational groups; and
- The definition of what should be considered “relatively small” and “relatively large” in hypotheses 1a,b and 2a,b.

An important assumption underlying the conceptual model presented in Figure 5.1 concerns the relationship between ICT use and the organizational structure (see also the research model in Chapter 1). Several shifts in the organizational structure are assumed to take place. These are caused by (the interaction between organizational structure and) ICT use, resulting in an indirect effect of ICT on social cohesion as presented in hypotheses 1a and 1b. Consequently, the tenability of the assumptions regarding this relationship should be examined before testing these hypotheses. Hypotheses 2a and 2b regarding the direct effect of ICT on social cohesion, include some assumptions concerning the social impact of CMC. This social impact will probably interfere with the personal characteristics of individuals, as well as organizational characteristics. More insight into the respondents’ experiences regarding this social impact may help interpret the results of the actual testing of hypotheses 2a and 2b. The task of testing these hypotheses requires a reliable and valid
instrument for measuring cohesion as social attraction towards organizational groups. As discussed in Chapters 2 and 3, no widely accepted and well-tested scale is available to measure this form of attraction in smaller and larger organizational groups. Thus, an instrument of this kind first needs to be developed and tested. Finally, one aspect of the hypotheses formulated is not yet explicit. A distinction in expected effects of ICT use is made between “relatively small” groups and “relatively large” groups. However, it is not yet clear what groups should be considered “relatively small,” or “relatively large.”

To take account of these aspects, we will conduct three separate studies. The first study explores the assumptions regarding the relationship between ICT use and shifts in organizational structure with a view to strengthening the theoretical argumentation underlying these assumptions. The second study concerns the development and testing of an instrument to measure social attraction (social attraction) in organizational groups. The scale developed will be tested further in the third study, which seeks, in its turn, to test the hypotheses formulated. This study also devotes attention to the assumed social impact of CMC, exploring and defining “small” and “large” groups. The diagram in table 6.1 presents the three studies, which cover the aspects listed and include actual testing of the hypotheses.

<table>
<thead>
<tr>
<th>Study 1</th>
<th>Study 2</th>
<th>Study 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examining the tenability of the assumptions regarding the relationship between ICT use and organizational structure.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Developing an instrument to measure cohesion as social attraction in organizational groups of varying size.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Exploring assumptions regarding the social impact of CMC.</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Exploring what should be understood by “relatively small” and “relatively large” group.</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Testing the hypotheses formulated regarding the relationship between ICT use and social attraction in organizational groups.</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.1: Three studies conducted to examine assumptions and hypotheses with regard to the effect of ICT use on social cohesion in organizational groups.

Conducting a separate study for the development of an instrument to measure (cohesion as) social attraction in organizational groups seems to be a logical step. After all, it would increase the chances of obtaining a reliable and valid scale for the study testing the hypotheses. In addition, by conducting a separate study to examine the tenability of the assumptions regarding the relationship between ICT use and organizational structure, we could explore organizations that differ substantially in their ICT use. It was assumed that the shifts expected in organizational structure would occur to some extent in any
organization that uses ICT. However, those shifts were thought to become more visible as ICT use intensifies and/or as it extends over longer time periods. To examine the tenability of these assumptions, organizations that differ in their intensity and duration of ICT use should be studied. Organizations that use ICT intensively for longer periods are most interesting for the purposes of testing the hypotheses regarding the relationship between ICT use and social attraction in the third study. Social effects, as discussed in Chapter 4 (section 4.2), take some time to occur. For that reason, they may not be manifest (yet) in organizations whose use of ICT is not very intensive and/or spans a relatively short period.

The following sections illustrate the design, sample and line of reasoning for the analysis of data for each study. The last section discusses the issue of generalization of findings as well as the aims of our research design.

6.1 Study 1: ICT and organizational structure

This study was conducted to explore the assumptions regarding the relationship between ICT use and organizational structure, and thus to reinforce the argumentation underlying these assumptions. Several shifts in organizational structure are assumed to be related to ICT use in organizations. This study is explorative: the assumptions include "variables" (shifts in organizational structure) that can diverge in different directions. Moreover, variables other than ICT use may also play a substantial role in causing these shifts, a role not (yet) recognized in the theoretical assumptions. Given the explorative nature of this study and its aim to reinforce the theoretical argumentation underlying several assumptions, we opted for a qualitative approach. Qualitative research is often explorative and is used more to develop and fine-tune theories than to test them (Galtung, 1988). This section describes the design, selection of cases and analysis of data for this study. The results are reported in Chapter 7.

Design
We used what is termed a case study design for this study. As mentioned earlier, shifts in organizational structure can have causes other than the one assumed: ICT use. However, these causes are not specified in the assumptions. By studying the relationship in a case study, or more specifically, in a real-life context (Yin, 1989), we can take account of, and possibly even identify, the influence of these other causes. Since the relationship between ICT use and shifts in organizational structure is assumed to be reciprocal, an interaction between both variables is expected over time, resulting in the assumed organizational shifts. In exploring this interaction, we should examine several organizations that vary in the time periods and degree of intensiveness of their ICT use. This is what Yin (1989) calls a multiple-case design. Several cases (organizations) are included, in which the assumed relationship is studied.
A method often used in qualitative research is the interview, which serves to create open discussions of several topics. The respondents’ replies with reference to these topics may prove relevant. These (semi-structured) interviews not only engender discussions of the assumed relationships, but also bring to light other variables and relationships that may be relevant. In this study, we conducted two rounds of interviews. In the first round, we interviewed ICT experts to gain an overall impression of the organization in general and a clear picture of the intensity and duration of ICT use in particular. In the second round, key persons with regard to organizational (structural) issues informed us about shifts in organizational structure and their possible causes.

**Selection of cases**
Several organizations (cases) were selected. The selection criteria were the intensity and the duration of ICT use. It was assumed that the shifts expected in organizational structure occur, to some extent, in any organization, but become more visible with more intensive and longer-term ICT use. Using the dimensions “intensity of use” and “duration of use,” we can identify four different types of organizations (Table 6.2). For each cell, at least one organization was selected. Most changes were expected in organizations in the fourth cell. In light of that, two organizations were selected in this cell.

In making our selection, we approached 45 Dutch organizations (more than 200 employees, profit as well as non-profit, different branches, only main offices). The ICT experts in these organizations were questioned, using a small electronic survey, about the duration and intensity of ICT use in their organization. In this selection procedure, 20 of the organizations responded by completing the questionnaire and returning it to us. Based on the results, we were able to select organizations in the different cells.

<table>
<thead>
<tr>
<th>Use of ICT</th>
<th>Relatively small length</th>
<th>Relatively large length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not very intensive</td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>Organization A</td>
<td>Organization B</td>
</tr>
<tr>
<td>Very intensive</td>
<td>III</td>
<td>IV</td>
</tr>
<tr>
<td></td>
<td>Organization C</td>
<td>Organization D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Organization E</td>
</tr>
</tbody>
</table>

*Table 6.2: Selected cases for Study 1*

**Analyses**
All interviews were written and the answers structured systematically based on the shifts assumed in organizational structure. This approach enabled us to compare the results of the different interviews on crucial points. The results of these analysis form input for further fine-tuning of the assumptions regarding the reciprocal relationship between ICT use and organizational structure, and indirectly, the hypotheses regarding the relationship between ICT use and social attraction in organizational groups.
6.2 Study 2: Development of the Social Attraction Scale

The second study concerns the development and testing of an instrument to measure (cohesion as) social attraction in organizational groups. As discussed in Chapter 3, the instruments available for measuring attraction are based mostly on small groups. Moreover, these instruments have rarely been used in an organizational setting. Based on the consequences of social attraction in organizations (see discussion in chapter 3 and table 3.2), we developed a list of items for measuring social attraction, the Social Attraction Scale. This scale also takes account of the implications for operationalizing cohesion, which were also discussed in chapter 3 (section 3.4). This scale has been tested for reliability and validity in a quantitative study.

Although we noted that no suitable instrument is available to measure social attraction in organizational groups, there are measurements of attraction that come very close to the approach used in this study. And even though these instruments will not measure the same phenomenon that the Social Attraction Scale does, scores on both instruments will probably correlate to a great degree. Thus, other attraction scales can be useful, (among other methods), for testing the scale developed. This study makes a comparison with the Group Attitude Scale (Evan & Jarvis, 1986). This will be discussed further in Chapter 8, which reports on the results of this study.

Design

A scale construction design was used for our second study. Several groups were selected, in which the developed scale was tested. We preferred to use real-life groups, especially with regard to testing the validity of the scale. In (construct) validity tests, comparisons are made with variables that are assumed to be related to the construct (or concept) studied. Although a conceptual model of cohesion was constructed containing the antecedents of this social concept, other - non-identified - variables may also be of influence (e.g. personal characteristics, as argued in Chapter 3). As with the previous study, therefore, these factors should be taken into account even though they may not be identified in this study. We can do this by drawing on a real-life setting.

Since Study 3, which uses the scale developed in this study, gathers data by means of a survey (the choice and method of which will be discussed and illustrated in the following section), we used a survey to test this scale. We distributed a questionnaire among the groups selected. It included the items of the scale developed as well as items for measuring other variables (e.g. several antecedents of attraction and an alternative attraction scale), which were used to test the scale's validity. An example of this questionnaire can be found in Appendix I. Chapter 8 illustrates the operationalization of the antecedents included and presents the results of this study.
Selection of cases
Since a comparison will be made with an alternative attraction scale developed for small groups, this study will require selection of relatively small groups. Secondly, these groups must have characteristics of both organizational groups and characteristics of other kinds of groups more frequently studied in research on attraction. Given these requirements and various practical considerations (easy access), several college student work groups were selected for this study: five first-year student work groups ranging in size from 20 to 24, and two work groups of more advanced students. The first-year groups met twice a week, and the others only once a week. All of groups were formed only about a month before the questionnaire was distributed. As a result, the members of each group did not yet know each other very well. What is more, the groups were not formed on a voluntary basis. Because of their characteristics, the groups were suitable for testing the scales developed to measure attraction in organizations whose groups do not form on a voluntary basis and whose members (i.e. in large groups) may not know each other very well.

One organizational group was also included. This group, which contained 27 members, was interesting for this study. Unlike the other groups studied, it spoke for organizational groups that had already existed for quite some time (about six years) and whose members knew each other quite well.

The overall response was 88%; (158 of the 181 distributed questionnaires were returned). Because the distribution of the questionnaire in the student work groups could be done during class time, the response was high. The response per group varied between 68% and 100%. In total, 20 of the 27 members in the organizational group returned the questionnaire (about 74%).

Analysis
Analyses were conducted at the individual level, testing the reliability and validity of the scale developed. A regular reliability test was performed, using a standard measurement for homogeneity. A "second-level" reliability test (Gallhofer, Saris & Melman, 1986) was also conducted, comparing scores on the Social Attraction Scale with scores on the Group Attitude Scale.

With regard to the validity of the scale, correlations were computed between scores on the Social Attraction Scale and the so-called "attraction gap," (which will be illustrated in our discussion of the scale in Chapter 8). A regression analysis was conducted to explore the relationship between several antecedents and social attraction, since the theory assumes an independent contribution of these factors on attraction. If social attraction, as defined by Hogg (1992), is indeed measured by the scale developed, the antecedents formulated on the basis of his theory should explain a (considerable) part of the variance in attraction.

To test the homogeneity of scales, as well as the two tests of validity, we could take the results of all the different groups together. Two groups, who received a questionnaire containing items of an alternative scale of group attraction were included; here, the second level reliability test was conducted.
6.3 Study 3: ICT and social cohesion

The third study is the most extensive and includes the actual testing of the hypotheses regarding the relationship between ICT use and social cohesion. This study is partly explorative, (examining “what should be understood by a “relatively small” and “relatively large group””). It also serves a testing function (of “the hypotheses formulated regarding the relationship between ICT use and social cohesion in organizational groups”).

The first study serves to fine-tune the argumentation (assumptions about the relationship between ICT use and organizational structure) underlying the indirect relationship between ICT use and social cohesion. As far as the data allows us, we will devote attention to these assumptions in the third study as well. The second study offers a useful scale for measuring cohesion as social attraction in organizational groups. This will be tested again in this study before analyzing the data collected with regard to the hypotheses formulated. Two more aspects will be covered by this study before actual testing of the hypotheses. We will discuss assumptions regarding CMC’s social impact and explore our understanding of “small” and “large” groups, providing more explicit descriptions.

A quantitative approach appeared to be the most appropriate for the purposes of this study, given its testing character. This section discusses the design, selection of cases and analysis of data for this study. The results are presented partly in Chapter 8 (reliability and validity of the Social Attraction Scale) and in Chapter 9.

**Design**

The arguments presented for Studies 1 and 2 can be said to apply to this study. Although a conceptual model of cohesion was constructed, (a model including the expected impact of ICT use), other, non-identified variables may also be of influence. It was advisable, therefore, to conduct this study in a real-life context, in which the influence of other – non-identified - variables can be included. In light of this, we opted for a (multiple) case study design. In several organizations (cases), organizational groups were selected. Since differences in the effect of ICT use on social cohesion are expected between small and large groups, the groups selected varied in size and ICT use. Provisional size categories were formed, based on the availability of group sizes in the organizations selected and on what could be instinctively considered “small” and “large.” A middle category was also included to stretch the difference between the categories of small and large groups. Cases and groups were selected with a view to obtaining a sample of groups in each organization, more or less equally divided over the size categories. This made it possible in each case to examine differences in effect of ICT use between small and large groups.

As briefly mentioned in the previous section, a survey was used to collect data. Survey research can be used in collecting data about a large number of subjects and/or in measuring a variety of variables concerning motives, attitudes, opinions, etc. (Swanborn, 1987). This study measures many variables, including attitudes and opinions. Since this study prefers the inclusion of a variety of organizational groups, the number of respondents will be fairly high.
Although survey research is often seen as the most appropriate for explorative and descriptive research, it can also be used to collect (large amounts of) data to test hypotheses about relationships or differences.

Before distributing questionnaires, all case studies were preceded by several interviews with key figures, usually from the personnel department. In these (unstructured) interviews, we explained our study and selected groups. Moreover, information (e.g. about group size and maturity) was gathered about the different groups included in the case study. In some cases, this information was also requested in the questionnaire, and both sources were used to determine these variables.

The questionnaire included the Social Attraction Scale and consisted of 50 to 60 questions - almost all in closed answer format. Different antecedents of cohesion, identification with the group, the use of several ICT applications and opinions concerning the social impact of CMC were measured. Chapter 8 will describe the operationalizations of antecedents of social attraction and discuss the testing results for the Social Attraction Scale. Other operationalizations will be illustrated, discussing the testing results for hypotheses concerning the relationship between ICT use and social cohesion in Chapter 9. Appendix II presents (an example of) the complete questionnaire.

**Selection of cases**

Groups in four different organizations were selected. The organizations themselves were selected on the basis of various criteria. As mentioned at the beginning of this chapter, organizations whose use of ICT is fairly intensive and spans longer periods are interesting to this study. Secondly, the organizations must be fairly large, containing groups of different sizes. The third criterion concerns “the variety of ICT use” within the organization. Since this study is interested in the effects of ICT use, we felt it worthwhile to include organizations that contain groups who differ in their use of ICT applications. We also strove to select organizations that were somewhat similar. The organizational culture, structure and branch often influence the kind of people who choose to work for an organization and how they perceive themselves as part of that organization. This also refers to the personal characteristics discussed earlier (sections 3.1 and 3.2). Although these were not measured in this study, they definitely play some role in the development of social attraction within groups. The last, but definitely not the least, of our criteria concerned the willingness on the part of the organization’s management to be part of this study. The questionnaire was fairly long and the respondents filled it out during working hours. Not every organization we approached for this study was particularly happy about the time it cost their employees. This limited our choice to the organizations that were somehow interested themselves in the potential social effects of ICT use, and who were willing to invest their employees’ time to learn more about it.

Ultimately, four organizations were selected for our research. One organization, which was included in Study 1, was also selected for this study. Organizations categorized in cell IV (Table 6.2) are interesting in terms of studying the effects of ICT on social cohesion. E is
fairly large and its use of ICT varies considerably throughout the organization. In light of that, this organization, a Dutch ministry, was also selected for Study 3 and served as starting point for the selection of other organizations in this study. In addition to E, we selected two other governmental organizations (F and H) that met the criteria. We also added a large profit-run organization to the sample. Organizations E and F have comparable organizational cultures and structures. The third governmental organization (H) is interesting because of its relatively intensive use of ICT (as compared to that of the other three organizations). Although run for profit, organization G is comparable to organization H, since both belong to the service industry. We included organization G mainly because, at the time of this study, e-mail had just been introduced in several segments of the organization (less than a year previously), whereas other segments had already been using e-mail for a long time. Consequently, this organization was characterized by a large variety in ICT use. All four organizations were committed to our research study and encouraged their employees to fill out the questionnaires.

Selection of groups within cases
Within each organization, several groups were selected. Selection was based partly on criteria regarding size (filling three provisional size categories, based on ‘common sense’ of what to consider small and large) and ICT use, and partly on advice from an in-house consultant. In some cases, for instance, the management was interested in specific groups. The consultants were also helpful in finding a set of groups, which were, insofar as possible, representative of the organization. In organizations E and F, we had the opportunity to gather information using a short survey about ICT use in the different groups comprising those organizations. That information was used in selecting groups in these organizations.

In total, 129 groups were selected in the four organizations. The groups selected and the response rates are presented in Table 6.3. Unfortunately, it was not possible to fill out the different size categories equally. The task of selecting large groups proved particularly problematic. A group can only be selected if the members of that group actually recognize the group as theirs. In the case of small groups, this was not a problem. We were able to select a considerable number of groups, varying in size from 5 to 30 members. However, the organizations selected were - despite their commitment to and interest in the study - still somewhat reserved in agreeing with the selection of a considerable number of groups.

Large groups (ranging from 50 to 100 members) often consist of several smaller groups, such as project teams or work groups. People are often inclined to consider the smallest entity to which they belong as their group. In selecting larger groups, we needed to find groups with boundaries that were distinct enough to ensure clarity in the questionnaire as to what group we meant. This aspect limited the number of large groups that we were able to select. Secondly, since every member of a selected group was to receive a questionnaire, the reservation that the selected organizations showed was particularly directed at the selection of large groups.
To test the hypotheses, we used individual scores to compute group characteristics (presented in the conceptual model; see Figure 5.1). To do this effectively, the response within the group had to be sufficient. For these analyses, we included only groups with a response rate of 40% or higher. We did this under the assumption that at that rate, the results would be useable for the entire group. This selection method might influence the results somewhat. However, the inclusion of group variables based on a minimum response from a group seemed to be more harmful to the reliability of the results. In using this criterion, however, we were limited to fewer groups for the different size categories in each organization (see last column of Table 6.3). This makes separate testing of the hypotheses for each case fairly problematic.

With the small groups, the analyses for each case may still be possible. However, in exploring the data, it could prove possible to fine-tune the size categories. In our discussion of the theory, we noted that the effects expected in small groups may be different from those in “very small” groups. Thus, this category might be split into sub-categories, which would also make it difficult to study small groups separately for each case.

The original idea of testing the hypotheses separately for smaller and larger groups in each case is not feasible with the data collected. However, with some adjustments to the original design, the amount of data and number of groups is still considerable and useful for this study. The following section discusses these adjustments and the data analyses.

<table>
<thead>
<tr>
<th>Case</th>
<th>Population</th>
<th>Selected groups</th>
<th>Questionnaires sent/received</th>
<th>Response rate</th>
<th>Groups with response &gt;40%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization E</td>
<td>4000</td>
<td>&lt;30 30</td>
<td>970/333</td>
<td>34.3%</td>
<td>&lt;30 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30-50 2</td>
<td></td>
<td></td>
<td>30-50 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50-100 6</td>
<td></td>
<td></td>
<td>50-100 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>total 38</td>
<td></td>
<td></td>
<td>total (45.2%) 16</td>
</tr>
<tr>
<td>Organization F</td>
<td>2000</td>
<td>&lt;30 32</td>
<td>622/254</td>
<td>40.8%</td>
<td>&lt;30 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30-50 5</td>
<td></td>
<td></td>
<td>30-50 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50-100 5</td>
<td></td>
<td></td>
<td>50-100 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>total 37</td>
<td></td>
<td></td>
<td>total (47.7%) 15</td>
</tr>
<tr>
<td>Organization G</td>
<td>5000</td>
<td>&lt;30 21</td>
<td>549/192</td>
<td>35.0%</td>
<td>&lt;30 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30-50 4</td>
<td></td>
<td></td>
<td>30-50 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50-100 2</td>
<td></td>
<td></td>
<td>50-100 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>total 27</td>
<td></td>
<td></td>
<td>total (62.7%) 14</td>
</tr>
<tr>
<td>Organization H</td>
<td>30.000</td>
<td>&lt;30 23</td>
<td>584/204</td>
<td>34.9%</td>
<td>&lt;30 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30-50 3</td>
<td></td>
<td></td>
<td>30-50 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50-100 1</td>
<td></td>
<td></td>
<td>50-100 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>total 27</td>
<td></td>
<td></td>
<td>total (59.6%) 14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>129</td>
<td></td>
<td></td>
<td>59</td>
</tr>
</tbody>
</table>

Table 6.3: Selected cases and groups for Study 3
Re-design and analysis

Since it is not possible to test the hypotheses for each case separately, some adjustments were made to the original design. As mentioned earlier, this study contains an explorative and testing segment. With regard to the latter, only groups with a minimal response rate of 40% were included. We were able to use all of the data collected in most of our explorative research. In that segment of the study, the differences between smaller and larger groups are not yet that important. This made it possible to follow the original design. For each separate case, we explored the results regarding ICT use, structural characteristics and CMC’s social impact. We were also able to take an initial step towards exploring the provisional size categories. In actually testing the hypotheses about the effect of ICT use on social cohesion in smaller and larger groups, we performed a cross-case analysis for each size category instead of analyzing each case separately. Essentially, we used two “entrances” for the data analyses: data categorized by case (organization) and data categorized by size (see Figure 6.1).

Aside from the aspects discussed so far, attention should be paid to the reliability and validity of the Social Attraction Scale, which is tested again in this study. The “entrance” of data categorized by size for this analysis appeared to be the most appropriate method. (After all, this part of our research can be considered a continuation of study two, where the scale, which is used to test hypotheses in different size categories, was not yet tested in groups of different sizes).
Step 1: Testing reliability and validity of the Social Attraction Scale

We began with a thorough study of the reliability and validity of the Social Attraction Scale. The line of reasoning for testing the scale, is comparable to the one followed in Study 2. One exception is the comparison with an alternative attraction scale, since this study includes smaller and larger groups. An extra validity test could be conducted by comparing scores on the Social Attraction Scale with scores for identification with the group. Given that the Social Attraction Scale is assumed to be reliable and valid in smaller, as well as larger, groups, the reliability and validity tests were performed in each provisional size category. Chapter 8 presents the results of this first step of the analysis.

Step 2: Exploring expected structural characteristics, CMC’s social impact and differences between size categories

Before actually testing the hypotheses, we explored the data for each case separately, focusing on the different aspects distinguished in Table 6.1. ICT use versus structural characteristics is explored and the social impact of CMC experienced in each organization is described. Thus, differences in social cohesion in the provisional size categories are examined for each organization. Further fine-tuning of the size categories will be done by actual testing of the hypotheses.

Step 3: Testing the hypotheses regarding the effect of ICT use on social cohesion in organizational groups

The third step involves actual testing of the hypotheses by studying the relationships expected between ICT use and social cohesion in the data collected. A cross-case analysis is used, which focuses on groups in different size categories. As discussed earlier, we were only able to include groups with a response rate of higher than 40% for these cross-case analyses. With such a selection, however, we were unable to draw any conclusions regarding the separate organizations from these analyses. Instead of categorizing the data for each case, we categorized it by size in this segment. In this way, we were able to draw conclusions regarding different size categories. First, (Pearson’s) correlations between the different variables were computed and a regression analysis conducted. Results of both analyses were compared to the assumptions formulated and relationships hypothesized. Secondly, these results will provide some directions for testing the conceptual model presented in Figure 5.1. The causal relationships in this model were tested, using multivariate analysis.

As regarding the third step of the analysis, we should make a remark concerning one antecedent: “leadership.” The role of the group leader was not operationalized and measured in this study. This role can have many different influences and requires a study of its own to be fully understood. In the previous chapters, it was argued that a leader might stimulate group members to join together and actually form a group. Other leaders may simply
stimulate interaction within the group. A third possibility concerns the degree of effectiveness of the leadership, which can contribute to social cohesion. Finally, a leader's charisma can reinforce identification with the group and indirectly stimulate social cohesion. Because of all these different potential roles that leaders can play, this variable was too complicated to be included as a single factor in this study. Regarding the impact of ICT use on this antecedent, changes in coordination, and thus interaction patterns, are emphasized. Since interaction is included in this study as a factor that influences cohesion, the influence of leadership related to ICT use is implicitly taken into account.

As concerning other antecedents of cohesion, some were measured at (or aggregated to) group level and analyzed on that level; for others this was done on the individual level. This was already discussed and explained in Chapter 5, which presented the conceptual model (figure 5.1).

6.4 Summary and generalization of findings

This chapter discusses empirical research activities. We have identified several aspects that merit special attention before the hypotheses formulated can actually be tested. Three separate studies will be performed, which cover these aspects. The first study concerns the assumptions formulated regarding the relationship between ICT use and shifts in the formal organizational structure. Since hypotheses 1a and 1b concerning the indirect relationship between ICT use and social cohesion are based on these assumptions, it is useful to explore these assumptions further in a qualitative study. In the multiple case study, the assumptions are explored in 5 different organizations (cases), using interviews.

The second study aims to test a scale developed for measuring cohesion as social attraction, namely the "Social Attraction Scale." As no well-tested instruments were available for measuring social cohesion in smaller and larger organizational groups, a new scale was developed based on the conceptual model of cohesion as social attraction presented in Chapter 3. The scale's reliability and validity were tested in several college work groups and one organizational group.

The third study, also featuring a multiple case study design, actually tests the hypotheses regarding the relationship between ICT use and social cohesion. In four organizations (cases), different groups of different size categories were selected. Before testing the hypotheses, we thoroughly re-tested the Social Attraction Scale used in this study for reliability and validity. During the group selection process, several selection problems emerged (especially in regard to large groups). As a result, we re-designed our study. Instead of testing the hypotheses in each case separately, we conducted a cross-case analysis for each size category.
Generalization of findings

Our research (all three studies) seeks to test assumptions and hypotheses embedded in a conceptual model. In other words, the aim is to make a comparison between relationships found in empirical data and the relationships described by the conceptual model. This is what Yin (1989) calls "analytic generalization." This is a form of generalization, "in which a previously developed theory is used as a template with which to compare empirical results of the case study" (1989:38). This form of generalization is used in each study.

The first study examines assumptions regarding the relationship between ICT use and shifts in organizational structure. In other words, relationships found in the case studies selected are compared to relationships described in theory. In this way, the theoretical assumptions are strengthened or adapted based on the empirical results. The second study included several groups comprised of individual respondents, groups in which the Social Attraction Scale developed was tested. Individual empirical results are compared to theoretical assumptions embedded in the conceptual model of social cohesion. The relationships in this model are compared to relationships found in the data collected.

The third study is somewhat more complicated. Again, analytic generalization takes place. The relationships found in the data can be compared to the conceptual model presented in Chapter 5. However, in this study, variables at the organizational level are computed by means of individual scores. In other words, conclusions are drawn about the organization based on the empirical results of the sample of that organization. Thus, within each case, statistical generalization takes place, since conclusions are drawn about a population (organization) based on the empirical results of one sample (Yin, 1989). In order to do this, the sample in question must be representative of the organization as a whole. This requirement was taken into account in selecting groups in all four organizations. In the testing segment of the third study, a cross-case analysis was conducted at the individual level in several size categories. The results are compared to the hypotheses and conceptual model presented in Figure 5.1.

This research study does not aim to generalize its findings to all organizational groups. The theoretical assumptions and hypotheses regarding the possible effect of ICT use on social cohesion in organizational groups are explored and tested in a real-life context. This gives us information about the tenability of the hypotheses, and points the way for further research in this field.