Abstract

In this paper a communication survey within a company is evaluated using exploratory as well as confirmatory factor analysis. Data sets from two surveys, one performed in 2008 and one in 2009, are used for the analysis. Starting with an exploratory factor analysis, a reduced factor model is created for each year, and compared with a model built from the assumptions of the original questionnaire. The composition of questions and question areas in the original questionnaire is not supported by our analysis. The results for the two years are somewhat different, which could be explained by certain actions that have been taken within the company towards improving elements within internal communication. These conclusions are however not strongly supported from a statistical point of view. Finally some changes that could be made to the questionnaire are suggested, which comprise of omitting some dubious questions, altering the composition of some question areas and rephrasing some of the questions in order to be able to measure all statements according to the same response scale.

Thanks

I would like to express my gratitude to Gösta Hägglund for support and guidance during my writing this paper. I would also like to thank the company that has let me use the survey data, although it cannot be mentioned by name, since it wishes to remain anonymous.

Content

Appendicises

1. Introduction

Through my company I have been asked to perform an internal survey for a client, aimed at measuring different aspects on Communication. The client has about 930 employees located in more than 30 countries. The client has kindly let me use the data from the surveys, but wishes to remain anonymous in this paper.

The client's purpose of the survey is to use the descriptive statistics as a basis for discussions on how to improve the quality and efficiency in communication issues throughout the company. The reports consists of mean values and histograms for the company functions and other organisational units. Results for all units within the company consisting of 5 persons or more are compiled and the local managers are responsible for the feedback and implementation, with the support from the Human Resource department.

The design of the questionnaire, i.e. questions, question areas and response scales are all decided by the client and have hence not been possible to influence.

The client has not expressed any explicit need for the questions that will be posed in this paper. Despite this, it is my hope and belief that the content will be of interest in the further evaluation of the survey project. Based on this assumption I have decided to write in English, since this is the client's corporate language.

In section 2 the purpose and the methods used in this paper will be described. Section 3 goes through the details about the questionnaire, such as questions, question areas and response scales. Section 4 describes the statistical theory that will be used in the analysis. Section 5 starts with a brief view of the descriptive results from the survey, followed by an analysis of the 2008 data. First an exploratory factor analysis will be performed in order to find a model that describes the data. Based on this reduced model, a factor model will be designed and then tested against a model based on the original questionnaire areas. The analysis will then continue with the 2009 data set, following the same steps. Section 5 ends with a comparison between the estimated models for the two years. In section 6 follows a discussion on possible improvements to the existing questionnaire and suggestions to further areas of study.

2. Purpose and Method

The overall purpose of this paper is to evaluate a questionnaire focusing on communication issues. It has been performed on two separate occasions, meaning that we have two separate data sets to analyze and compare. More specifically the purpose is the following:

- Based on exploratory factor analysis and if needed, make adjustments to the setup of the original questionnaire and omit questions that are found to be of no relevance, thus suggesting a reduced factor model.
- Create a factor model based on the original questionnaire structure and compare it to the reduced factor model.
- Compare the reduced models estimated from the two data sets from 2008 and 2009 and check if they are consistent with one another.
- Scrutinize the division of "Present state" and "Importance" for some of the questions and investigate whether this division is justified.
- Based on the analyses and if needed, suggest an altered structure than the one used in the current questionnaire and suggest changes to forthcoming surveys.

The questionnaire was filled in on the Internet during 24th of March – 8th of April 2009. No personal information has been stored in the survey, i.e. it is completely anonymous which was made very clear when inviting the participants. The previous survey, using exactly the same questionnaire, was performed in March 2008.

The methods that will be used are Exploratory and Confirmatory Factor Analysis in SPSS and LISREL software.

3. The survey

3.1 Organisational structure

In the survey, the company has been divided into six functions: Sales, Administration, IT, Finance, Products and Other functions. The last group consists of two small functions, having been added together due to anonymity reasons. As a second level organisational choice, more than 60 sub-units were specified.

The number of responses within the functions varies a great deal, from 9 (Other) to 388 (Administration). In this paper we will however only deal with the data set for the total population.

3.2 The questionnaire

3.2.1 Questions and question areas

The questionnaire consists of six question areas. See below for the headers and a brief explanation. The exact questions and statements are found in Appendix 1. The distribution of the number of questions per area is quite uneven; see the number of questions within brackets.

1. Communicative leadership (6)
   Evaluation of the immediate manager with respect to how well he/she communicates, listens and informs.

2. Involved and committed employees (6)
   Evaluation of how well employees actively are able to find and share information.

3. Clear communication structure (31)
   This area begins with an overall question on how well the general communication within the company is perceived. This is followed by a question divided into 11 sub-questions on how well the different communication channels work within the company. These 11 questions are then repeated from an importance perspective. Then follows a question consisting of four sub-questions on how well employees are informed about overall issues such as vision, policies, HR and market matters. These four sub-questions are also repeated from an importance perspective.

4. Communication toolbox (4)
   This area asks questions on how frequently the Intranet and an internal newsletter is being read. Another two questions deal with efficient emailing and time for meetings.

5. Scanning the external world (4)
   This area consists of four questions on how well people are informed about various external issues and input from customers.

6. Media relations (1)
   The last question area consists of only one question on how often people hear about the company from Media.

3.2.2 Response scales

All questions are asked according to four point scales. There are a couple of different scales:

a) As a response to a statement:

Totally disagree	Partly disagree	Partly agree	Totally agree

b) As a response to a question:

Very poor	Poor	Good	Very good

c) As a response to “How often?” (1)

Never	Several times per month	Several times per week	Every day

d) As a response to “How often?” (2)

Never	Rarely	Often	Very often

e) As a response to how important something is:

Not important at all	Not so important	Important	Very important

The scales a) and b) measure how well something is. I.e. the choices to the right on the scales are the most desirable ones. For the scales c) and d) this is not necessarily the case. When looking at specific questions this is made clearer. In for example question 16, where one is asked how often the respondent read/hear of/see the company in Media, the scale is d) above. Since publicity can be either negative or positive we cannot say what choice on the scale is the most desirable one. Questions 8 and 9 however will in this paper be defined as following a negative-positive scale, since it is desirable to have employees use the Intranet frequently and to read the CEO letter. See Appendix 1 for detailed phrasings of these questions.

The scales are all given explanations for each alternative, something which is widely acknowledged as important in order to receive as accurate responses as possible. This is among others argued by Dahmström (1991).

Since there is no alternative such as “Don’t know”, this could, as Dahmström (1991) points out, have the effect of making people skip the questions instead of answering them. In for example questions 4 and 5, there are a larger portion than for other questions who have chosen not to respond, indicating that these questions may be difficult to answer in the absence of such an alternative. See Appendices 2 and 3 for descriptive data and number of lost responses. The inclusion of this type of alternative could then have the effect of more respondents choosing an alternative. Trouth however, describes situations where the addition of this kind of alternative produced more “Don’t know” responses than the number of people who would have chosen to skip the question if the “Don’t know” alternative did not

exist. The inclusion of a “Don’t know” alternative could thus be offering an easy way out, rather than having more people choosing an alternative that expresses an opinion.

Since we are dealing with four point scales, we do not have a mid alternative, which is something that has been debated a great deal. Dahmström (1991) stresses the importance of having such an alternative to ensure that the respondents do not decline to answer or that they otherwise will choose an alternative that does not reflect their opinions.

Others argue that a response scale with no mid alternative forces respondents to have an opinion rather than escaping to not have an expressed opinion by simply choosing a neutral standing. There is much research on this subject with inconclusive evidence as to whether a scale of 5 or 6 or even more is to be preferred. (Davis et al.). Weng finds that increased scale alternatives improve the quality with respect to reliability. If there is a need to make people take sides, it could perhaps be advisable to use a six degree scale, since we then would have more nuances to the scale. Chang (1994) compared 4 point scales with 6 point scales and concluded however that validity was not affected by changing scales.

In a summarizing paper Trouth shows that there are researchers supporting scales ranging from 4 to 7 in terms of high validity and reliability. One can only draw the conclusion that there is no simple answer as to how many alternatives the response scales should have.

Throughout the data set, all questions and statements are coded such that the most positive response in scales a) and b) are given the value 4. Similarly a higher frequency in scales c) and d) (to the far right on the scale) is given the value 4. Finally, the questions that are considered to be the most important according to scale e) are given the value 4.

It assumed throughout this paper that the differences between the alternatives are treated equally large. This is something which is not necessarily true; the difference between “Totally disagree” and “Partly disagree” in scale a) above, may very well not be equally large as the distance between “Partly agree” and “Totally agree”. In other words the data material is assumed to follow interval scales although it is measured along an ordinal scale. This assumption is however necessary in order use the data set and perform an analysis. (Trouth)

4. Theory and methods

4.1 Factor analysis

4.1.1 Exploratory factor analysis

In the search to describe unobservable factors such as attitudes, intelligence etc., factor analysis can be used. Through the study of correlations between observable variables we can construct such unobservable, or latent, factors. Below follows a brief summary of factor analysis based on the presentation by Sharma (1996). This section will not go into great detail by deriving the models, but will provide enough theory to be able to follow the analyses in section 5.

Factor analysis was introduced by C. Spearman in 1904 to explain student performance. Spearman proposed a one-factor model which later on was further developed by L.L.Thurstone into multiple factor analysis (Hägglund, 2001). Consider the model described in diagram 1 below. Let's say that Y_1 is students' quantitative skills and Y_2 is their verbal skills. We cannot observe these latent factors directly, but we can measure the indicators, or variables, X_i, which in this particular case are grades in Mathematics, Physics, Chemistry, English, History and French.

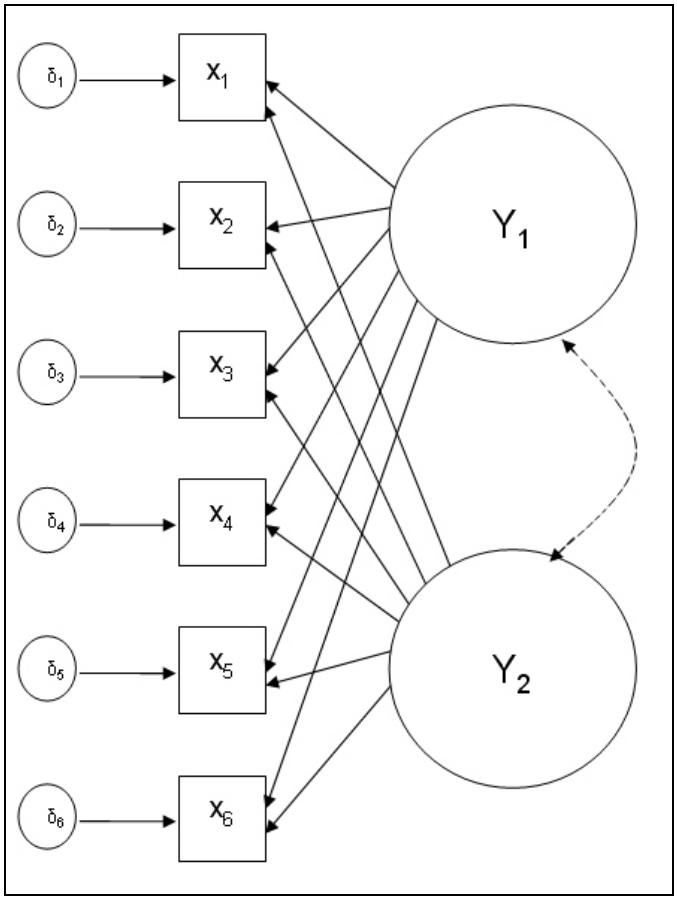

Diagram 1: Relationships between observable variables X_i and latent factors Y_i, Exploratory model

The relationships can be described as equations:

$$X = \beta Y + \delta \qquad (1)$$

where X is a column vector of the observable factors, Y is a column vector of the latent factors and δ is a column vector of the specific aptitudes for the student. β is a matrix of so called pattern loadings. So what we have is a set of linear relationships describing student's grades. One can see the parallel to regression equations where the grades X are the dependent variables, the latent factors Y are the independent variables, δ are the error terms and the pattern loadings β are the regression coefficients. Thus the larger the pattern loadings, the stronger impact of the factor on the variable. The latent factors are responsible for the correlation between the variables. The variables thus correlate, since they have the latent factors in common, assuming that all variables depend on all factors as depicted in diagram 1 above.

As shown in Sharma (1996) the total variance of a variable is divided into two parts:
1. Variance that is in common with the latent factor Y, which is referred to as communality.
2. Variance in common with the specific factor δ which is the total variance of the respective variable minus its communality. This is referred to as the specific variance.

The correlation between a variable and a latent factor is called the structure loading. The square of the structure loading is the shared variance between the variable and the factor, i.e. the communality. The communality is commonly used as a reliability measure of a factor; the larger the communality, the more reliable the impact of the factor on the variable. If the factors are not correlated, the factor model is called orthogonal, whereas if the factors are correlated the model is called oblique. Sharma (1996) shows that if the factors are uncorrelated, the pattern loadings and the structure loadings are the same. The dotted line between the factors in diagram 1 indicates that the factors may be correlated depending on our model assumptions.

In the example of students' grades, one can in Sharma (1996) see that grades in Mathematics, Chemistry and Physics have high loadings on the latent factor labelled Quantitative skills whereas grades in English, History and French have high loadings on the factor Verbal skills. These relationships were not known beforehand, but was something that resulted from a factor analysis. This approach, when we do not have a perception of how the factor solution should look like, is called Exploratory Factor Analysis (EFA).

In factor analysis we can thus through a correlation matrix of the observable variables, identify latent factors that are the basis for the correlations among the variables and estimate pattern and structure loadings, communalities, shared and specific variances. One important part when identifying the factors is that the theoretical aspects need to be taken into consideration. The labelling of the factors thus needs to be done with great care.

In diagram 1 above there are six variables and two latent factors. There are however no limits as to how complex a model can be in terms of the number of entries. Nor is it necessary that all variables depend on all factors. We do however wish to identify as few factors as possible that explain as much of the correlation as possible in order to have the models as easy as possible to interpret. It is also usually assumed that the number of factors should be far less than the number of variables. (Sharma, 1996)

4.1.2 Factor indeterminacy

As Sharma (1996) describes, the solution of a factor analysis model is not unique due to two indeterminacies:
a) Factor indeterminacy due to the factor rotation problem.
b) Factor indeterminacy due to the estimation of the communality problem.

Let us assume that we have another set of equations:

$$X = \beta^{*}Y + \delta \qquad (2)$$

It can be shown that for this model, with values for β^{*} that are different than for β in (1) above, the total communalities are the same; the unique variances are the same; the correlation matrices are the same. The communality of a variable with each factor is however different in the two models, but the sums are the same. In other words, there is no unique factor solution. The total communality can be deconstructed in an infinite number of ways, which in turn will generate an infinite number of factor solutions. This is the problem referred to in a) above.

The question is then which model to choose. The answer is to choose the solution that is the most plausible one, given the theoretical assumptions for the factors we are trying to measure. Rotation can be described as having the objective of achieving a simpler factor structure that is easier to interpret. With rotation we mean that the factor solution can be transformed, or rotated, into any other solution. The term rotation relates visually to that we have a multidimensional space, one axis for each factor. The axes can be rotated while keeping the angles intact, which is an orthogonal rotation. Alternatively we can also alter the angles in the rotation, which is a oblique rotation.

In the orthogonal rotation we assume that the factors are uncorrelated, whereas in the oblique rotation, we assume that the factors are correlated. The results from an oblique rotation are more complex to interpret, making the orthogonal rotation methods the more popular ones to apply in Social Sciences. (Sharma 1996). In this paper the Varimax rotation will be used, which is an orthogonal rotation. The Varimax rotation minimizes the number of variables that have high loadings on each factor, thus simplifying the interpretation of the factors. (NC State University). As will be discussed in section 5 and Appendix 10, the outcome of an oblique rotation will however be briefly discussed.

The next problem goes as follows: In order to determine the pattern and structure loadings and the shared variances, we need to estimate the communalities. But in order to estimate the communalities we need to estimate the loadings. This problem is the one referred to in b) above.

The solution to b) is solved through various iterative procedures which are now standard in software packages such as SPSS and SAS. The iteration continues until the estimates of the communalities converge. But as Sharma (1996) states, if the number of iterations are larger than 30, a warning has to be issued that the data set might not be suitable for factor analysis. There are various techniques such as Principal Axis Factoring, Generalized Least Squares, Maximum Likelihood (ML) etc. (Sharma 1996). The method used in this paper will be Maximum Likelihood, which according to Sharma has desirable properties such as asymptotic efficient estimates and provides a basis for hypothesis testing. In ML the factors are formed based on linear combinations, where the parameter estimates are the most likely to have resulted in the observed correlation matrix. (NC State University). It has to be noted that the Maximum Likelihood method assumes multivariate normality when statistical tests are performed (Sharma, 1996). The ML method is also the default method in LISREL that we will use in the confirmatory factor analysis. Since we are comparing these results from the ones coming from our exploratory analysis, it makes sense to use Maximum Likelihood.

4.2 Confirmatory Factor Analysis

In this section a model will be presented where there is a theoretical perception of how the factor solution should look like. I.e. we have a hypothesis we would like to confirm about which factors we have and how they are related to the variables. Hence the name

Confirmatory Factor Analysis (CFA). Consider diagram 2 below. The model that we propose is that there are two factors, Y_1 and Y_2; Variables X_1, X_2, X_3, are affected by factor Y_1; Variables X_4, X_5, X_6, are affected by factor Y_2. Here we can also estimate the correlation between the factors.

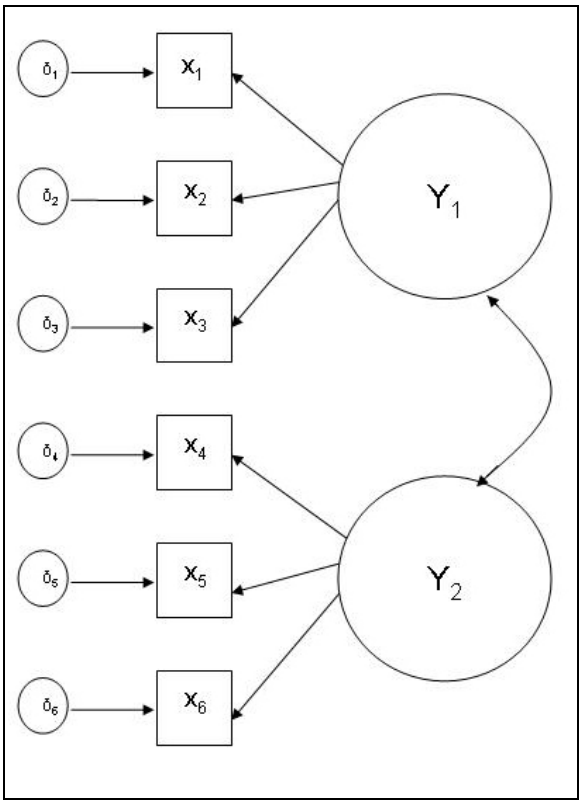

Diagram 2: Relationships between observable variables X_i and latent factors Y_i, Confirmatory model

The program that will be used for the Confirmatory Factor Analysis is LISREL, which stands for Linear Structural RELations (Jöreskog & Sörbom,1996). In LISREL we specify a model consisting of relations between observable variables and latent factors according to our hypothesis. The input data consists of a covariance or correlation matrix for the observable variables. Originally CFA was designed to use the covariance matrix rather than the correlation matrix. Correlation measure covariances for standardized data whereas covariances measure covariations among variables for mean-corrected data. Most confirmatory factor models are scale invariant, which means that the results will be the same. (Sharma 1996) LISREL has commands for specifying whether a covariance or a correlation matrix is used. In this paper the correlation matrix will be used.

The default estimation method is Maximum Likelihood. The results we get are the estimated coefficients and their standard errors and t-values, correlations between the factors, a number of Goodness of Fit indices and a Path Diagram describing the specified model with the coefficients, specific variances and correlations between the factors. It should be noted that if we do not specify so, LISREL will assume that the factors are correlated.

LISREL often suggests changes in the form of Modification Indices. It suggests changes to the model and computes how large a decrease in chi-square this would generate. In the chi-square test we test the null hypothesis that the population correlation matrix is the same as the implied correlation matrix resulting from our model specification. To test this we use the sample correlation matrix as an estimate of the population correlation matrix. We thus would not want to reject our null hypothesis if the desire is to confirm our factor model.

In practice however, the data and the model never converge, even if we would have access to the entire population. For large sample sizes, even small differences between the population and sample correlation matrices will be statistically significant. This means that the traditional chi-square-test is troublesome. In fact, the larger the dataset we have, the worse fit of the model we get. (Sharma 1996)

Therefore we need alternative goodness-of-fit tests. Most of these are different kinds of summaries of the residuals between the fitted and sample covariance matrices. In the descriptions below we will use the term covariance matrix since the test statistics originally were developed using covariances as input. As will be seen later on, the correlation matrices will however be used in the computations, following the same reasoning as above about scale invariance.

Examples of these tests are the Goodness-Of-Fit-Index (GFI), the Relative Goodness-Of-Fit-Index (RGFI), the Adjusted Goodness-Of-Fit-Index (AGFI) and the Root Mean Square Error of Approximation, RMSEA. The first three indices can take values between 0 and 1.

GFI measures the amount of variances and covariances in the sample covariance matrix that are predicted by the model. Values above 0,9 are considered to be a good fit. GFI may however be affected by sample size. (Sharma 1996).

$$GFI = 1 - \frac{tr\left[(\hat{\Sigma}^{-1}S - I)^2\right]}{tr\left[(\hat{\Sigma}^{-1}S)^2\right]} \qquad (3)$$

where $\hat{\Sigma}$ is the estimated covariance matrix and S the sample covariance matrix.

EGFI is the approximate expected GFI and consists of the degrees of freedom (df) , number of variables (p) and sample size (n)

$$EGFI \approx \frac{1}{1 + (2df \,/\, pn)} \qquad (4)$$

Sharma (1996) suggests to use a relative GFI (RGFI) instead. According to Sharma, the rule of thumb is that values larger than 0,9 are considered to be a good fit.

$$RGFI = \frac{GFI}{EGFI} \qquad (5)$$

Sharma (1996) describes AGFI as essentially GFI adjusted for degrees of freedom. Values for AGFI above 0,8 are considered to be an acceptable fit.

$$AGFI = 1 - \left[\frac{p(p+1)}{2df}\right]\left[1 - GFI\right] \qquad (6)$$

RMSEA takes the errors of approximation in the population into account. It is adjusted for degrees of freedom. This index tells how well a studied model fits the population covariance matrix. (Cudeck et al, 2001). Consider the following:

$$F = \ln\left|\hat{\Sigma}\right| - \ln|\Sigma| + tr\left(\Sigma\ \hat{\Sigma}^{-1}\right) - k \qquad (7)$$

where:

Σ is the population covariance matrix approximated by he sample covariance matrix
$\hat{\Sigma}$ is the fitted covariance matrix
k is the number of observed variables

$$RMSEA = \sqrt{\frac{F}{df}} \qquad (8)$$

For RMSEA, close fit is defined as RMSEA<0,05. A value between 0,05 and 0,08 is a reasonable error of approximation. (Jöreskog & Sörbom,1993)

In this paper GFI, RGFI, AGFI and RMSEA are chosen in evaluating model fit.

4.3 Approaches in this paper

The factor analyses that will be performed in this paper will have two different approaches. First we will use the data set as if we do not have a perception of how the variables should be grouped into different factors, i e. we will perform a Exploratory Factor Analysis. This analysis will follow the steps as outlined in SPSS Airseries part 1. Through our analysis a reduced factor solution will be suggested, consisting of those variables and factors that seem plausible.

One important distinction also needs to be made. As stated in the document "LISREL output files for measurement models":

> *"The measurement model specifies the relationships between the observed indicators and the latent variables while the structural equation model specifies the relationships amongst the latent variables".*

We are thus in this paper performing confirmatory factor analysis for various measurement models based on the outcome of the exploratory factor analysis. We are not constructing Structural Equation Models since we do not specify any relations between the latent factors.

Secondly, based on the outcome of the exploratory factor analysis, a reduced Measurement Model will be constructed and then compared with the original model, which is based on the questions and the question areas that already have been labelled in the questionnaire. This will thus be the original Measurement Model that we wish to confirm. We will then comment on similarities and differences between the two models.

These methods will be applied on the two data sets that we have access to. Finally there will be a discussion on similarities and differences between the analyses for the two years.

5. Results

5.1 Overview of the results

5.1.1 Descriptive data

The survey performed in 2009 was answered by 826 out of 930 employees (89%). Considering the fact that the employees are well wide-spread geographically, the main means of communicating with, and reminding respondents was through email, the response ratio is considered to be rather high. In 2008 it was answered by 698 out of 858 which is a slightly lower ratio (81%).

All question results were represented in histograms and mean values for the entire population as well as for various organisational units, resulting in more than 70 different reports.

A weighted total average was calculated, although the questions used are not responded to according to same scales, which of course is questionable. Bearing this in mind we have nevertheless classified the questions with scales which are all considered to be “from bad to good”, as “value” questions. These are all questions except 5a-5k, 7a-7d and 16. A histogram for all questions was also produced for questions classified as “value” questions.

Diagram 3 shows the total distribution of answers and the mean values for the 2008 and 2009 surveys. As can be seen, the overall average result has improved compared to the previous survey.

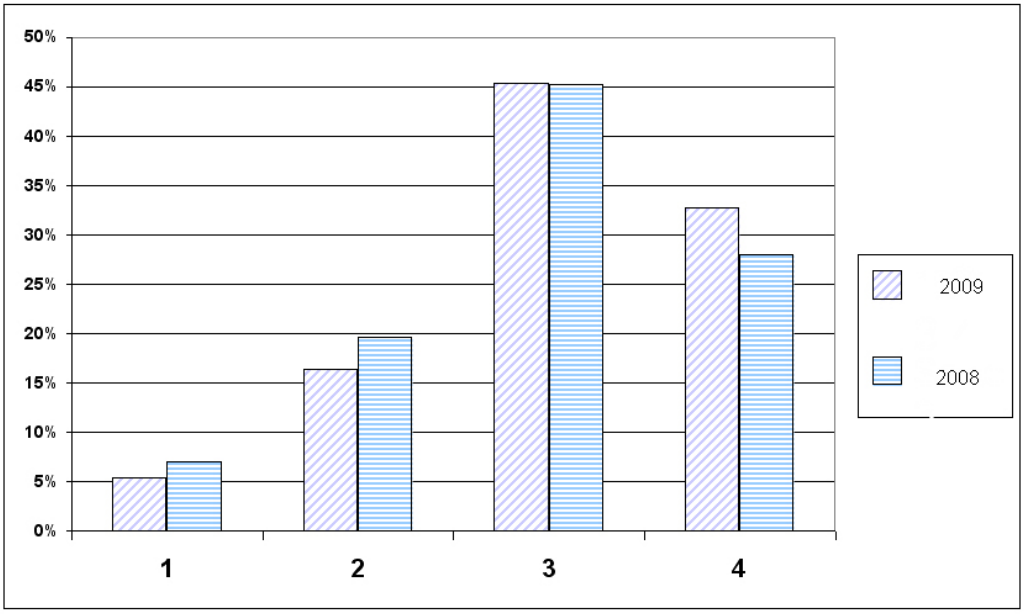

Diagram 3: Total distribution of value questions and total mean values for 2008 and 2009

5.1.2 Correlations between present state and importance

Questions 4 and 5 ask a number of questions concerning various communication channels. Question 4 asks for the respondent's view on the current state, i.e. how well-functioning are they? Question 5 asks for how important the respondents think these communication channels are. The results from questions 4 and 5 can be represented in a plot chart as shown in diagram 4 below.

Questions 6 and 7, which concern different information matters are asked and presented in a similar manner.

When looking at diagram 4, one gets the impression that there seems to be a linear relationship between the two dimensions. Does this mean that the respondents have difficulties in distinguishing the two concepts of present state and importance? I.e. are questions 5 and 7 redundant? This is one of the questions that we will try to answer in this paper.

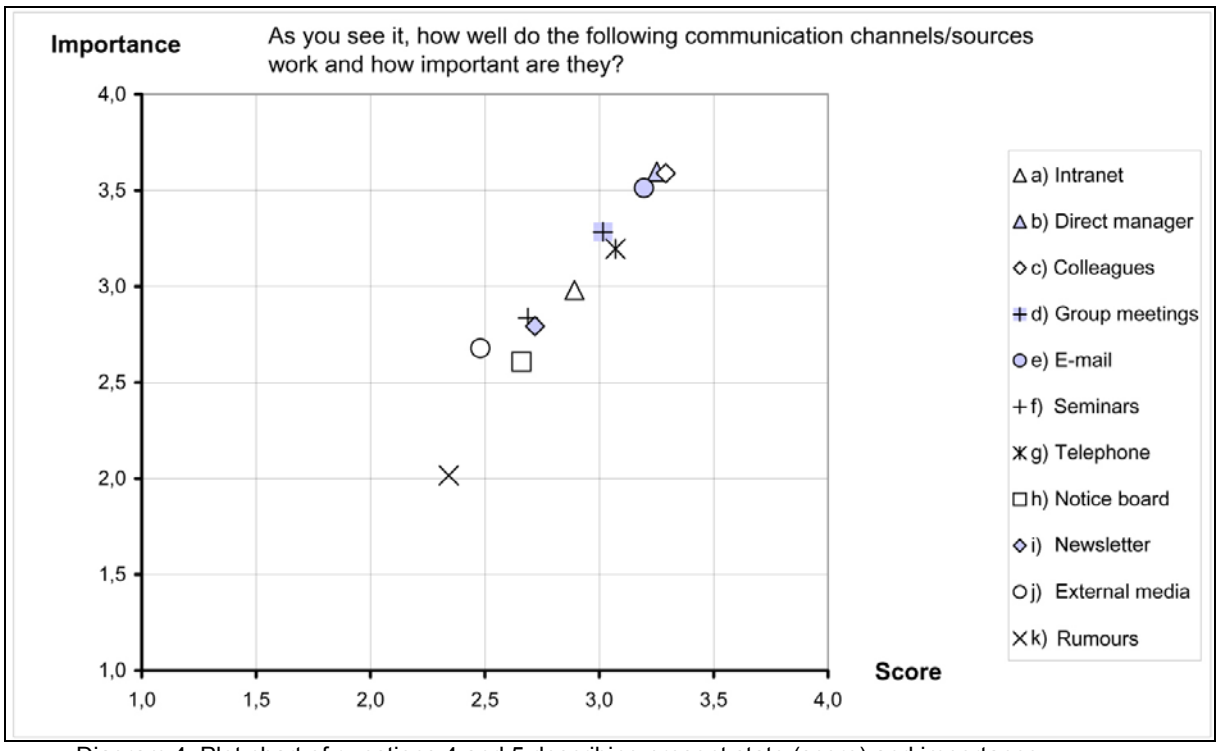

Diagram 4: Plot chart of questions 4 and 5 describing present state (score) and importance.

5.2 Definitions and descriptions of variables and areas in the questionnaire

As described in section 3.2.1 and Appendix 1, the questions and the areas they belong to according to the questionnaire are the following:

- Communicative leadership (CL): 1a, 1b, 1c, 1d, 1e, 1f
- Involved and committed employees (ICE): 2a, 2b, 2c, 2d, 2e, 2f
- Clear communication structure (CCS): 3, 4a-4k, 5a-5k, 6a-6d, 7a-7d
- Communication toolbox (CT): 8, 9, 10, 11
- Scanning the external world (SEW): 12, 13, 14, 15
- Media relations (MR): 16

First of all we need to remember that questions 5a-5k and 7a-7d measure importance. Clearly these questions should not be mixed with questions where we measure along a positive-negative scale.

Secondly, question 16 asks if employees hear about the company in Media. As stated before, it is hard to tell whether this is positive or negative. Also this is the only question in the question area “Media relations”, which makes it meaningless to use in a confirmatory factor analysis.

Finally, question 3 is a general question which is trying to capture the entire essence of the survey: *“I consider our company’s communication to be well functioning.”*

Questions 3, 5a-5k, 7a-7d and 16 will hence be excluded in the Measurement Models in sections 5.3.4 and 5.4.4 below. They will however be included in the exploratory factor analyses performed in sections 5.3.1 and 5.4.1 below. The reasons are the following:
1. We want to analyze the outcome of the exploratory factor analysis and the correlations between questions 4 and 5; 6 and 7 respectively, and see if questions 5 and 7 are superfluous.
2. Based on the exploratory factor analysis, we would like to investigate whether the exclusion of questions 3 and 16 is justified.

Furthermore, we will look into whether we should reduce the model further, based on what we find in the exploratory analysis.

5.3 Analysis of the 2008 data

5.3.1 Exploratory factor analysis of the original Model 2008

When running factor analysis in SPSS, the specifications are Maximum Likelihood estimation with Varimax rotation.

First of all we need to assess whether the data set is suitable for factor analysis. SPSS produces two such indicators. First there is the value for the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy. Sharma (1996) describes this measure as the extent to which the variables belong together. The value can take values between 0 and 1. Values between 0,8 and 0,9 are considered Meritorious whereas values larger than 0,9 are considered to be Marvellous. In our case the KMO value is 0,877 which is more than acceptable.

Another test that checks if data is appropriate for factor analysis is Bartlett's Test of Sphericity. It tests if the variables are significantly correlated with each other. This test is however, as Sharma (1996) describes, very sensitive to sample sizes. Therefore one should not rely too heavily on the outcome of this test. The Bartlett test in this case shows that the data is satisfactory, meaning that it is suitable for factor analysis, bearing in mind the limitations of the test.

The ML extraction of factors was set to include factors with Eigenvalues larger than 1, which is a method called Kaiser’s criterion (Field 2005) and is commonly used when applying Principal Components extraction. Essentially, the larger the Eigenvalue for a factor, the larger the portion of the total variance it explains (NC State University). We thus would like to keep the factors that contribute the most in explaining the total variance. While Principal Components is focusing on the variance, the objective of factor analysis is to explain correlations. However, since correlation and variance are related, we will use this method of limiting the number of factors.

Varimax was chosen as the rotation method. This rotation is orthogonal and thus presupposes that the factors are uncorrelated with one another. This is a rather strong assumption, but as Sharma (1996) describes, the results from an oblique rotation are sometimes difficult to interpret and is quite uncommon to use in Social Sciences. To compare the results, a factor analysis with an Oblique rotation was performed, see appendix 10. When going into the detailed analysis that will follow, the interested reader can compare the results from the Varimax and Oblique rotations. As stated previously, the Varimax rotation minimizes the number of variables that have high loadings on each factor, thus simplifying the interpretation of the factors. (NC State University)

When including all variables we got the results as shown in Appendix 6. Although our main focus is not to study the variance, we see that the total explained variance is 53,1% which is rather low. This is due to the fact that we chose to keep the factors with Eigenvalues larger than one. If more factors would have been included, a larger portion of the total variance would have been explained.

The communalities can take values between 0 and 1. In this case they range from 0,31 to 0,72. As previously said, the communality is the variance that is in common between the factor and the variable. If the communality is low, the unique variance is high. This means that we prefer high values for the communalities if we are to keep the variables in the model. There is no definite limit for when a communality is considered “too low”. We just need to remember to consider the value of the communalities when analyzing the factor loadings for the variables. Some advocate that communalities should be larger than 0,5 in order to be considered reliable enough. (Sharma, 1996)

The SPSS output of the rotated factor solution gives us the factor loadings, which describes the relationship between a variable and a factor. The factor loadings takes values between 0 and 1, the latter describing a perfect relationship between a factor and a variable. One important decision to make is which cut-off value for the factor loadings we will use. I.e. which value is considered to be high enough in order to consider the factor loading to be relevant to describe a relationship between a variable and a factor. Various approaches have been suggested, from a liberal 0,3 to a rather strict 0,55. (Swisher et al 2004). A frequently used cut-off value is 0,4 which will be used in this paper. Variables with high loadings on more than one factor are regarded as impure, and may be of a general kind or perhaps in need of rephrasing. Traditionally one tends to exclude impure variables from factor models (Sharma, 1996).

The area “Communicative Leadership” (CL) seems to be well described in the sense that we get high factor loadings for all questions in this area. These questions, 1a-1f, are well captured in Factor no 1.

2a deals with whether the respondents know where to find necessary information for their daily work. It has however a loading in factor 1 of 0.34 which is a little too low. It also has a loading about the same size on factor 4 which makes it dubious to include in future surveys.

Question 3 is the general question on overall communication. This question has an adequate loading on factor 4 but has loadings close to 0,4 on other factors, suggesting that our hypothesis about this question being a general one is supported. Thus question 3 will not be included in the reduced model.

Question 4b, which has a high loading on Factor 1, deals with how well the communication from the nearest manager works. Clearly this is related to this factor since the main theme for factor 1 seems to be “Leadership”. This question could be considered redundant since various aspects of manager’s communication skills already have been assessed in questions 1a-1f.

The question area “Involved and committed employees” (ICE) seems to have 4 questions that are well connected: 2c, 2d, 2e and 2f. These questions all deal with the sharing of, and asking for information among colleagues. The factor loadings for these questions range from 0.43 to 0.69. Factor 8 thus seems to form an area which can be described as “Information among colleagues”. Question 2c also has a rather high loading (0,51) in factor 4 together with questions 3, 4c, 4e, 5e and 10. The interpretation of this is not crystal clear, but the fact that the general question (3) is part of this factor, makes it look like a general factor with day-to-day activities (colleagues, email). Question 2c will be included in the factor model although it is not “pure” in the sense that it has a loading on only one factor.

The question area “Clear Communication Structure” (CCS), questions 3-7, does not seem to be a well assembled area from a Factor Analysis point of view. Questions 6a-6d dealing with information about general topics such as vision mission, policies, HR and market matters seems to be a well defined group of questions captured in factor 6. Question 2b also deals with information about mission, vision etc. and has a high loading on this factor, suggesting that it may be redundant in this questionnaire. Question 6d, asking for knowledge of external matters also has a high loading together with questions 12-16, which could be interpreted that this question may be misplaced and/or redundant. Factor 6 could then be labelled “Vision, Strategies and Policies”.

Questions 4a-4k are well scattered among several factors. Question 4j, just below the cut-off value, deals with external media and seems to be connected to questions outside the question area, namely questions 6d and 12-16 which all of them also deal with external matters. Factor no 2 is here regarded as equivalent to “Scanning the External World” or shorter: “External information”. Although we concluded that question 16 is not measured along a negative/positive scale, it is still related to the other questions dealing with external issues.

Questions 4h and 4i seem to form a group together with their own importance 5h and 5i, accompanied by importance questions 5f and 5j. Although 4h is below our cut-off value, its communality is rather high, so for the moment we will keep it in our model. Question 4i loads on more than one factor but will also for the same reason be kept for the time being.

Questions 4d and 4f form a factor that could be interpreted as “Meetings/seminars”.

Question 4a dealing with the Intranet seems to be closely related to its importance 5a and to question 8, also asking about Intranet issues. Then there is question 9 which asks on frequency with which people read a newsletter from the CEO distributed via email. Factor 9 thus could be labelled “Intranet/E-publications. Questions 10 and 11 do not seem to be related to questions 8 and 9 as suggested by the original questionnaire structure. Question 11 has no clear loading on any of the factors, making it redundant in the questionnaire.

For questions 4k and 5k, dealing with rumours, present state and importance, seem to be highly correlated with each other, but to no other questions. The same go for questions 4g and 5g, dealing with communication over the phone.

Questions 7a-7d are the same as questions 6a-6d but from an importance point of view. These four questions form a group of questions in factor 3 with high loadings. The hypothesis of questions 6 and 7 being correlated does not seem to be supported, since they then should have belonged to the same factor. This conclusion could also be drawn by examining the correlation matrix in Appendix 4, where the highest correlation is 0.26 (6a-7a).

5.3.2 Summarizing the 2008 factor analysis – Reduced model 1

When choosing the number of factors, various methods can be applied. Choosing factors with Eigenvalues larger than 1 is one method as described earlier. When applying this method the result was 12 factors.

Another method is the scree plot, which describes the aggregated Eigenvalues and the number of factors graphically. The curve for the 2008 data set is depicted in diagram 5 below. As described by NC State University, the curve can be described as an elbow, and the rule is to choose the number of factors found where the elbow starts. As can be seen this is not very clear and it is quite easy to fall in the subjectivity trap, thus picking the number of factors that suits the analysis. In our case it is hard to tell whether we should pick 5 or 6 factors. We will use this method in this paper as an indicator, not necessarily being the only basis for the decision as to how many factors that will be chosen.

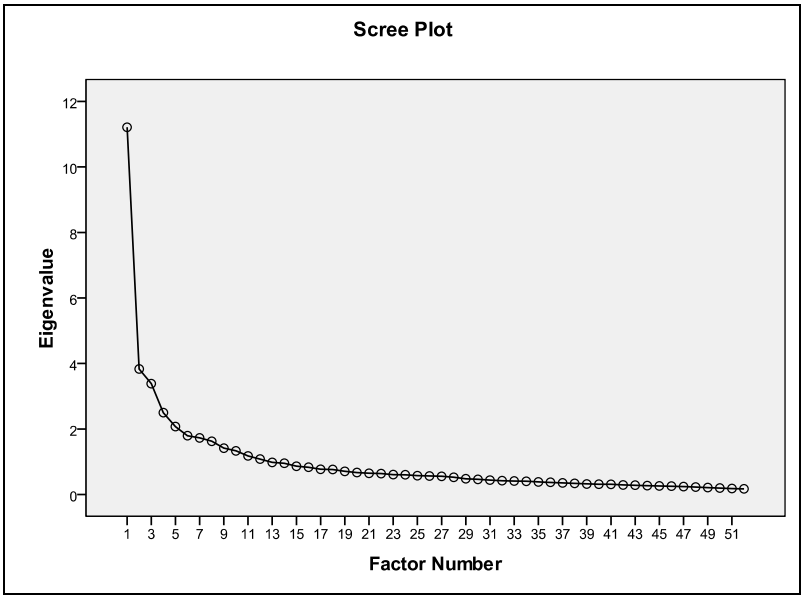

Diagram 5: Scree plot, Maximum Likelihood, Varimax rotation, 2008 data

Other methods such as Parallel Analysis, Minimum Average Partial etc. (NC State University) are also frequently used, but will not be considered in this paper.

Based on the factor analysis performed in 5.3.1 the following latent factors can be formed:

- Leadership (1a, 1b, 1c, 1d, 1e, 1f)
- Information among colleagues (2c, 2d, 2e, 2f)
- Vision, Strategies and Policies (6a, 6b, 6c)
- External information (12, 13, 14, 15)
- Meetings (4d, 4f)
- Publications (4h, 4i)
- Intranet (8,9)

We have thus chosen to distinguish seven factors in our model.

The following questions were omitted:

- Questions 5 and 7 were omitted since they are importance questions and hence not suitable for a measurement of the overall satisfaction with communication.
- Question 16 is omitted based on the fact that the scale is not defined as negative/positive.

- Topics with questions that have related phrasings have been omitted. (2b, 4a, 4b, 4c and 6d.
- Questions 3 was omitted since it is defined as a general question.
- Questions 2a, 4k and 11 were omitted since they did not add anything useful to the dataset.
- Questions 4e and 10 are closely related. If we are to omit one we are left with only one question on emailing, and it makes no sense to have a factor consisting of only one question.
- Similarly, question 4g is omitted since it by itself would constitute a factor.

5.3.3 Testing 2008 Reduced model 1

When running the reduced model we get the results in table 1 below, consisting of six factors with Eigenvalues larger than 1. The factor loadings larger than 0,4 are marked in bold.

We find that the assumed factors “Meetings” and ““Publications” cannot be distinguished from one another. They do however form a clearly defined factor which may be interpreted as “Communication channels” as in the original survey.

Rotated Factor Matrix								Communa-lities
		Factor						
	Question	1	2	3	4	5	6	
Leadership	1a	**,684**	,076	,149	,112	,115	-,201	,561
	1b	**,693**	,133	,191	,114	,234	-,138	,621
	1c	**,723**	,098	,141	,123	,152	-,072	,597
	1d	**,840**	,077	,095	,090	,038	,008	,730
	1e	**,837**	,079	,047	,113	,022	,065	,727
	1f	**,805**	,038	,017	,187	,049	,102	,697
Information among colleagues	2c	,238	,218	,145	**,517**	,289	-,274	,551
	2d	,219	,092	,037	**,615**	,221	-,178	,516
	2e	,125	-,033	,075	**,708**	,028	,141	,545
	2f	,131	,054	,085	**,742**	-,077	,224	,634
Meetings	4d	,206	,142	**,485**	,057	,136	,139	,339
	4f	,101	,135	**,634**	,059	,048	,323	,540
Publications	4h	,102	,297	**,641**	,087	,092	-,105	,536
	4i	,075	,250	**,684**	,091	,056	-,094	,555
Vision, Strategies and Policies	6a	,220	,297	,126	,136	**,607**	,303	,631
	6b	,237	,343	,137	,113	**,672**	,254	,721
	6c	,189	,352	,320	,058	**,453**	,195	,508
Intranet	8	-,040	,058	,014	,031	,068	,201	,051
	9	-,027	,016	,042	,010	,066	**,426**	,189
External information	12	,158	**,457**	,154	,016	,162	,129	,300
	13	,026	**,692**	,190	,067	,086	-,008	,527
	14	,065	**,804**	,252	-,030	,080	,065	,725
	15	,081	**,424**	,128	,108	,200	,056	,258

Explained variance: **52,4%**

Table 1: 2008 ML estimates, Varimax rotation, Reduced model 1

Question 8 has no loadings on any factor. The communality is only 0,051 meaning that there is almost no variance in common with the factors. Since we removed question 4a based on the hypotheses that it was a close duplicate of question 8, we will once more include it in the model while instead excluding question 8, and investigate the outcome.

Question 9 seems to form a factor itself, which is not very useful. Its communality is also very low which makes us delete it from the model. Question 6c has rather high loadings on three factors but it has a communality of 0,508 which is quite high, so we decide to keep it in the model, although it is not pure.

We thus test the "Reduced model 2" which gives us clearly defined latent factors and fairly high factor loadings. See detailed results in table 2. The value for the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0,873 which is more than acceptable. The Bartlett test also shows that the data set is suitable for factor analysis, although we need to remember the limitations of the test.

Even if we are not primarily interested in the variance in factor analysis, we see that the total explained variance is still rather low, 52,2%.

The communalities range from 0,26 to 0,74, which means that some variables do not have that large a proportion of its variance in common with the factors. If however the loadings have passed the threshold of 0,4, we have decided to keep the variables in the model.

Rotated Factor Matrix							Communa-lities
		Factor					
	Question	1	2	3	4	5	
Leadership	1a	**,697**	,157	,112	,073	,044	,531
	1b	**,698**	,204	,120	,119	,178	,589
	1c	**,725**	,148	,144	,083	,139	,594
	1d	**,837**	,081	,102	,070	,083	,729
	1e	**,820**	,039	,123	,063	,097	,702
	1f	**,783**	,018	,199	,025	,128	,670
Information among colleagues	2c	,257	,197	**,459**	,190	,157	,376
	2d	,234	,091	**,569**	,076	,111	,404
	2e	,102	,068	**,751**	-,042	,067	,586
	2f	,108	,073	**,737**	,042	,030	,563
Communication channels	4a	,047	**,477**	,095	,144	,077	,266
	4d	,199	**,446**	,060	,112	,201	,296
	4f	,080	**,552**	,083	,119	,186	,367
	4h	,115	**,654**	,075	,251	,074	,514
	4i	,088	**,763**	,073	,192	,011	,632
Vision, Strategies and Policies	6a	,188	,141	,160	,247	**,684**	,610
	6b	,204	,165	,126	,273	**,762**	,741
	6c	,166	,339	,076	,288	**,536**	,518
External information	12	,144	,174	,028	**,434**	,235	,295
	13	,025	,238	,075	**,675**	,118	,533
	14	,068	,288	-,030	**,773**	,167	,713
	15	,078	,156	,108	**,404**	,228	,257

Explained variance: 52,2%

Table 2: 2008 ML estimates, Varimax rotation, Reduced model 2

The reduced model 2 is thus the following:

- LEAD: Leadership (1a, 1b, 1c, 1d, 1e, 1f)
- IC: Information among colleagues (2c, 2d, 2e, 2f)
- CC: Communication channels (4a, 4d, 4f, 4h, 4i)
- VSP: Vision, Strategies and Policies (6a, 6b, 6c)
- EI: External information (12, 13, 14, 15)

Our reduced model is then more consistent with the scree plot that indicated that we should have 5 or 6 factors. With this selection we will in section 5.3.4 below, generate a Measurement Model in LISREL.

5.3.4 Testing 2008 Reduced model 2 in LISREL

The default estimation method in LISREL is Maximum Likelihood, which will be used in all LISREL analyses.

When running the reduced model 2 in LISREL we get an RMSEA of 0,078 which is bordering to the acceptable, since values between 0,05 and 0,08 are considered an acceptable fit. The Goodness-Of-Fit (GFI) index is 0,88, Adjusted GFI is 0,85, Relative Fit Index (RGFI) is 0,92. These are all relatively good results, given the cut-off values for the tests as described in section 4.2. The estimated model can be seen in diagram 6 below.

The path diagram shows:

- The names of the variables and latent factors.
- The estimated coefficients for the variables, located on the arrows from the factors to the variables.
- The estimated specific variances for each variable, located to the left of the variables.
- The estimated correlations between the factors, located on the arrows going between all factors.
- Chi-square and RMSEA test results.

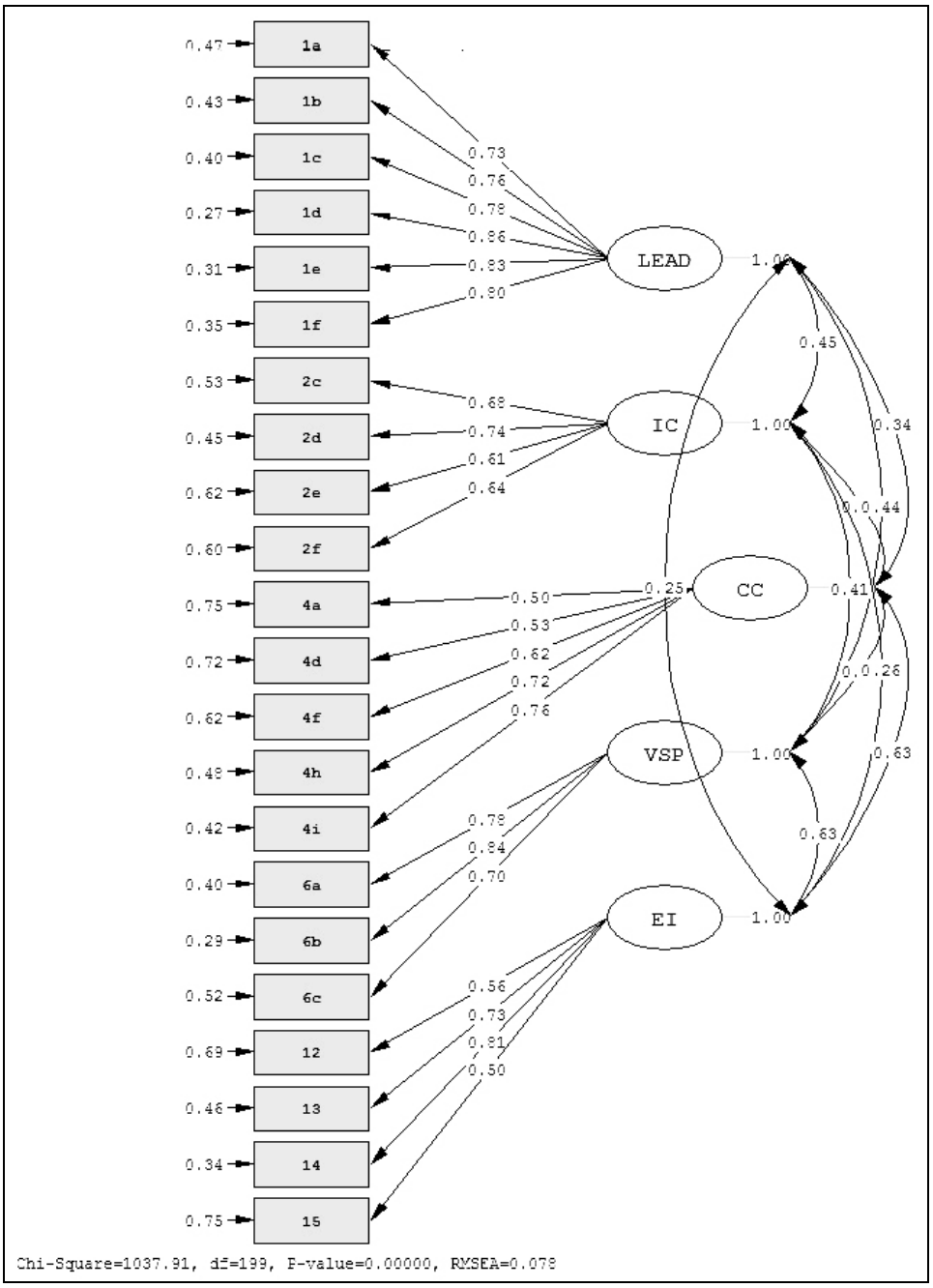

Diagram 6: Path diagram, 2008 Reduced model 2

From the LISREL analysis we find that all estimates are significant on a 1% level. Since the communalities are 1 minus its specific variance, or error term, we see that the communalities for some of the variables are quite low, suggesting that they may not be so suitable to be part of the factor model after all. This was also seen in table 2. We could thus question whether questions 2c, 2e, 2f, 4a, 4d, 4f, 12 and 15 should be included, since they are equal to, or less than 0,5. This rule should not be considered to be an absolute rule, but is suggested by Sharma (1996).

The correlations between the factors vary, the highest being between Vision, Strategies and Policies (VSP) and External information (EI) (0,63) and Communication channels (CC) and EI (0,63). The details for the correlation coefficients are found in the path diagram, but are most likely easier to read in the table found in Appendix 12.

VSP and EI can both be interpreted as overall issues, far away from daily work, which could explain the rather high correlation. The questions in CC could also be regarded as being rather distant to daily work matters and should hence also have a rather high correlation with EI.

The lowest correlation is between Internal Communication (IC) and EI (0,26). IC deals with matters close to daily operations, which could explain this rather low correlation with EI.

5.3.5 Confirmatory factor analysis - Full model 2008

The full model according to what was proposed by the original questionnaire was assembled in a Measurement Model and is shown in Appendix 7. This is in other words the confirmatory factor analysis for 2008. The model is defined as follows:

CL: Communicative leadership (1a-1f)
ICE: Involved and committed employees (2a-2f)
CCS: Clear communication structure (3, 4a-4k, 6a-6f)
CT: Communication toolbox (8-11)
SEW: Scanning the external world (12-15)

Question 16 has been omitted since it is measured along a scale which does not necessarily measure in terms of negative/positive. Questions 5 and 7 were omitted since they measure importance.

The result can be viewed in Appendix 7. When running the full model in LISREL, we get an RMSEA of 0,096 which is not acceptable, since it should be less than 0,08. The Goodness-Of-Fit (GFI) index is 0,74 and Adjusted GFI is 0,71 which are not satisfactory either. Relative Fit Index (RGFI) is 0,85 which is reasonably good though, since it is close to 0,9.

5.3.6 Comparing the full model with the reduced model - 2008

Clearly the reduced model has a better fit than the full model. In the reduced model we have adjusted the composition of the question areas according to the latent factors found in the exploratory factor analysis. We have also omitted questions not being qualified enough to be part of the model.

The coefficients for the variables in CL and SEW in the full model (See Appendix 7) and for Leadership (LEAD) and External information (EI) in the reduced model, are very close to one another. This is not so unexpected since the two factors LEAD and EI are relating to the same variables as CL and SEW in the original model. The coefficients for the variables in other areas differ more, due to the fact that we have a changed composition of factors compared to the original question areas and also because we have omitted questions that did not qualify to be part of the reduced model.

5.3.7 Reflections on the 2008 analysis

Our reduced model 2 has fairly good test statistics and can be justified from the perspective of how the communication issues could be structured and interpreted. It is however strongly reduced with respect to the number of omitted variables and the explained variance is quite low, 52,2%. The communalities for some of the variables are also on the lower end.

Question 5 dealing with importance seems to be redundant since many of the sub-questions are highly correlated with their counterparts in question 4. The other importance question (7) however, can be distinguished from its counterpart, question 6. The implications of this will be discussed in more detail in section 6.

The general conclusion when comparing the reduced model and the original model is thus that the latter is not supported by our analysis, in favour of the reduced model.

5.4 Analysis of the 2009 data

5.4.1 Exploratory factor analysis of the original Model 2009

As with the 2008 data set, the specifications in the factor analysis in SPSS were Maximum Likelihood estimation with Varimax rotation. The extraction of factors was set to include factor with Eigenvalues larger than 1. As in 2008 the resulting number of factors were 12.

When including all variables we got the results as shown in Appendix 8. The results indicate the following main findings:

The value for the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0,892 which is more than acceptable. Bartlett's Test of Sphericity is also satisfactory. The total explained variance is still rather low, 53,0%.

There are many similarities between the 2008 and 2009 results. The results will be commented briefly and the differences between the two years will be highlighted.

As for the 2008 data, the area “Communicative Leadership” (CL) is well described in the sense that we get high factor loadings for all questions in this area (1a-1f). This is factor no 1 in Appendix 8. In a similar way 4b also has high loading for this factor.

Question 2a still has no distinct belonging to any of the factors. The same goes for question 11.

Question 3 still has low loadings relating to more than one factor, suggesting that it still is a general question, not belonging to any particular factor. It will thus be omitted from the reduced model. In addition, this year there is no loading that exceeds 0,4 for question 3.

The question area “Involved and committed employees” (ICE) seems to have been split up since last year. Now there are two groups of questions consisting of two each. 2c and 2d form a factor together with question 4c. Question 2e and 2f form another factor. The labelling for these two could be expressed as “Sharing of information” and “Asking for information”. As before, question 2b is related to questions 6a-6d, forming a factor “Vision, Strategies and Policies”.

As for the 2008 data set, questions 7a-7d seem to be distinguished from 6a-6d, meaning that they are not correlated. This conclusion can be drawn by seeing that they are not part of the same factor, but also from looking at the correlation matrix for 2009. Both question 6 and 7

respectively form clearly defined factors. Question 6d has however rather high loadings in factor 3 which consists of the questions on external issues, 12-16.

Question 10 that concerns e-mailing, just below the cut-off value, is still related to the same factor as 4e, as was the case in 2008. It does however have a notable loading in factor 7. It seems that this question probably is not clearly enough phrased.

Questions 12-16 still form a clearly defined factor dealing with external matters. Factor no 3 thus could be named “External information”. Question 16 is however, as stated previously, measured using a different kind of scale, making it dubious to include.

The questions 4a – 4k are more closely related this year than 2008 with a couple of exceptions:

Question 4b is, as mentioned, related to leadership issues.

Question 4c, just below the cut-off value, seems to be correlated with its own importance and also related to other importance question, 5b and 5g (factor 11) which has no clear interpretation. It is also related to the other colleague-related questions 2c and 2d (factor 7). Question 4c thus seems to be redundant in the model.

Question 4e seems to be correlated with its own importance, but is also part of a larger group of questions in factor 5 (questions 4a, 4d-4j). The latter factor seems to constitute a factor “Communication channels”. Question 4a and 4g will be included although their loadings are slightly lower than 0,4, based on their reasonably high communalities and the fact that they seem to belong to the same factor as the other sub-questions in question 4.

The general impression from question 4 is that it seems to be more concentrated now than in 2008. The sub-questions in 4 are still highly correlated with their importance angles in question 5, in specific questions 4a, 4c, 4e, 4h, 4j, 4k. The asking of the entire question 5 thus seems unnecessary.

Question 8, asking about Intranet issues, and question 9 which asks on frequency with which people read a newsletter from the CEO distributed via email, are well grouped together in factor 9, which thus could be labelled “Intranet/E-publications

5.4.2 Summarizing the 2009 factor analysis – Reduced model 1

The scree plot for the 2009 data set can bee seen below in diagram 7. Bearing in mind the subjectivity issue, the scree plot is pointing towards a model consisting of 6 factors.

Based on the factor analysis performed in 5.4.1 the following seven latent factors can be formed:

- Leadership (1a, 1b, 1c, 1d, 1e, 1f)
- Sharing of information (2c, 2d)
- Asking for information (2e, 2f)
- Vision, Strategies and Policies (6a, 6b, 6c)
- External information (12, 13, 14, 15)
- Communication channels (4a, 4d, 4e, 4f, 4g, 4h, 4i)
- Intranet (8,9)

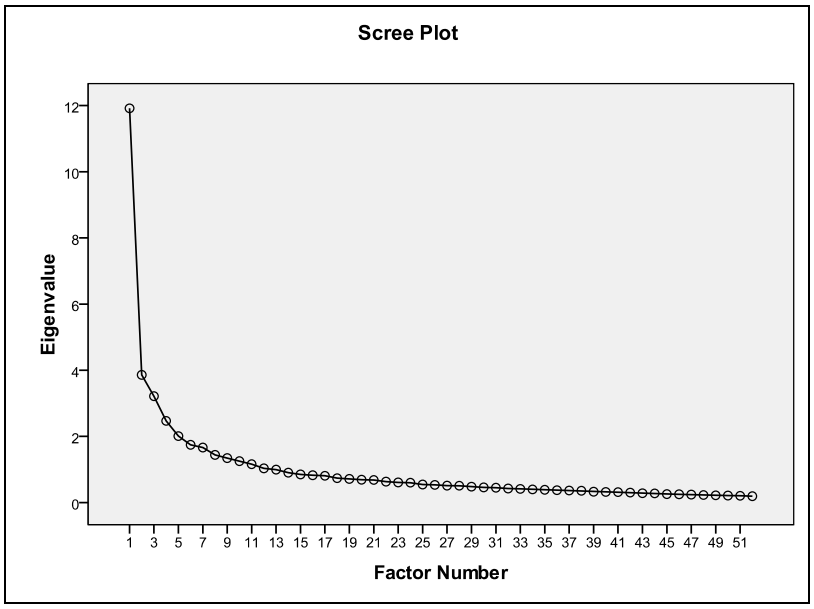

Diagram 7: Scree plot, Maximum Likelihood, Varimax rotation, 2009 data

The following questions were omitted:

- Questions 5 and 7 were omitted since they are importance questions and hence not suitable for a measurement of the overall satisfaction.
- Question 16 is omitted based on the fact that the scale is not defined as negative/positive.
- Topics with questions that have related phrasings have been omitted. (2b, 4b, 4c, 6d, 10).
- Questions 2a, 4j, 4k, 11 were omitted since they have loadings on more than factor and/or did not add anything useful to the dataset.
- Question 3 was omitted since it is defined as a general question, and also since its loadings are too low.

5.4.3 Testing 2009 Reduced model 1

When running the 2009 reduced model we find that the hypothesised factors “Sharing of information” and “Asking for information” cannot be distinguished from one another. See details in table 3 below. Questions 2c and 2d have quite high loadings for other factors, which makes them less reliable. We will thus exclude questions 2c and 2d from the model.. Questions 2e and 2f then form a fairly defined factor, which we will call “Information among colleagues”.

The remaining factors seem to cluster to the factors specified. The communalities are however on the lower end for some of the variables.

Rotated Factor Matrix								Communa-lities
		Factor						
	Question	1	2	3	4	5	6	
Leadership	1a	**,681**	,127	,135	,131	,172	-,026	,545
	1b	**,682**	,192	,158	,112	,141	-,059	,563
	1c	**,687**	,203	,103	,153	,105	-,053	,561
	1d	**,851**	,074	,058	,115	,085	,027	,755
	1e	**,770**	,120	,037	,063	,097	,116	,636
	1f	**,735**	,124	,008	,064	,159	,083	,592
Sharing of information	2c	,311	,385	-,040	,145	,388	-,122	,434
	2d	,385	,201	-,065	,114	**,465**	-,130	,439
Asking for information	2e	,169	-,001	,071	-,006	**,683**	,136	,518
	2f	,160	,067	,073	,075	**,679**	,104	,512
Communication channels	4a	,050	**,533**	,129	,148	,059	,257	,395
	4d	,253	**,548**	,106	,131	,020	,201	,434
	4e	,170	**,584**	,075	,092	,063	,058	,392
	4f	,202	**,521**	,127	,110	,028	,305	,434
	4g	,120	**,501**	,069	,152	,114	,130	,324
	4h	,056	**,639**	,214	,000	,045	-,114	,473
	4i	,077	**,637**	,188	,096	,010	-,060	,461
Vision, Strategies and Policies	6a	,163	,160	,259	**,698**	,102	,171	,647
	6b	,225	,203	,242	**,776**	,053	,116	,769
	6c	,179	,334	,273	**,507**	,035	-,007	,476
Intranet	8	-,009	,094	,048	,031	,016	**,493**	,256
	9	-,006	,072	,058	,102	,096	**,602**	,391
External information	12	,135	,209	**,524**	,225	,029	,205	,430
	13	,015	,303	**,745**	,086	,019	-,004	,655
	14	,095	,146	**,696**	,242	,017	,067	,579
	15	,172	,125	**,404**	,322	,131	,054	,332

Explained variance: 50,0%

Table 3: 2009 ML estimates, Varimax rotation, Reduced model 1

Based on this analysis, we get the “Reduced model 2” as presented in table 4 below, which gives us clearly defined latent factors and fairly high factor loadings. The value for the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0,888 which is more than acceptable. Bartlett's Test of Sphericity is also satisfactory, although this test is not completely reliable, as stated before. The total explained variance is still low, 52,4%.

The number of factors in the reduced model 2, are six which is the same as the analysis of the scree plot suggested. The communalities have improved some, but are still a bit too low, as for example for question 15.

Rotated Factor Matrix								Communa-lities
		Factor						
		1	2	3	4	5	6	
Leadership	1a	**,691**	,126	,142	,125	,134	,006	,547
	1b	**,692**	,195	,160	,106	,107	-,034	,566
	1c	**,691**	,206	,106	,151	,078	-,040	,562
	1d	**,855**	,088	,051	,123	,061	,005	,760
	1e	**,775**	,139	,024	,072	,073	,083	,638
	1f	**,741**	,141	,004	,073	,140	,054	,597
Information among colleagues	2e	,218	,037	,061	,020	**,551**	,099	,367
	2f	,170	,110	,045	,090	**,922**	,025	,901
Communication channels	4a	,062	**,521**	,146	,148	,019	,290	,403
	4d	,252	**,571**	,090	,147	,027	,126	,436
	4e	,173	**,589**	,071	,096	,057	,039	,396
	4f	,196	**,544**	,109	,130	,046	,235	,421
	4g	,127	**,523**	,056	,159	,111	,076	,336
	4h	,060	**,636**	,229	-,010	,015	-,105	,472
	4i	,078	**,632**	,196	,088	-,011	-,046	,454
Vision, Strategies and Policies	6a	,166	,166	,262	**,699**	,068	,161	,643
	6b	,226	,219	,227	**,781**	,046	,097	,771
	6c	,178	,332	,286	**,498**	,020	-,017	,473
Intranet	8	,003	,082	,061	,023	,001	**,611**	,384
	9	,001	,078	,051	,108	,111	**,640**	,443
External information	12	,141	,212	**,524**	,233	,055	,180	,430
	13	,024	,293	**,768**	,078	,007	,014	,683
	14	,098	,154	**,680**	,253	,046	,051	,565
	15	,191	,131	**,408**	,318	,101	,058	,335
Explained variance:		**52,4%**						

Table 4: 2009 ML estimates, Varimax rotation, Reduced model 2

The reduced model 2 is thus the following:

- LEAD: Leadership (1a, 1b, 1c, 1d, 1e, 1f)
- IC: Information among colleagues (2e, 2f)
- CC: Communication channels (4a, 4d, 4e, 4f, 4g, 4h, 4i)
- VSP: Vision, Strategies and Policies (6a, 6b, 6c)
- INTRA: Intranet (8,9)
- EI: External information (12, 13, 14, 15)

With this selection we will in section 5.4.4 below generate a Measurement Model in LISREL.

5.4.4 Testing 2009 Reduced model 2 in LISREL

When running the reduced model 2 in LISREL we get an RMSEA of 0,065 which is acceptable. The Goodness-Of-Fit (GFI) index is 0,90, Adjusted GFI is 0,88, and Relative Fit Index is 0,93, which are all very good results. The estimated model can be seen in diagram 8 below.

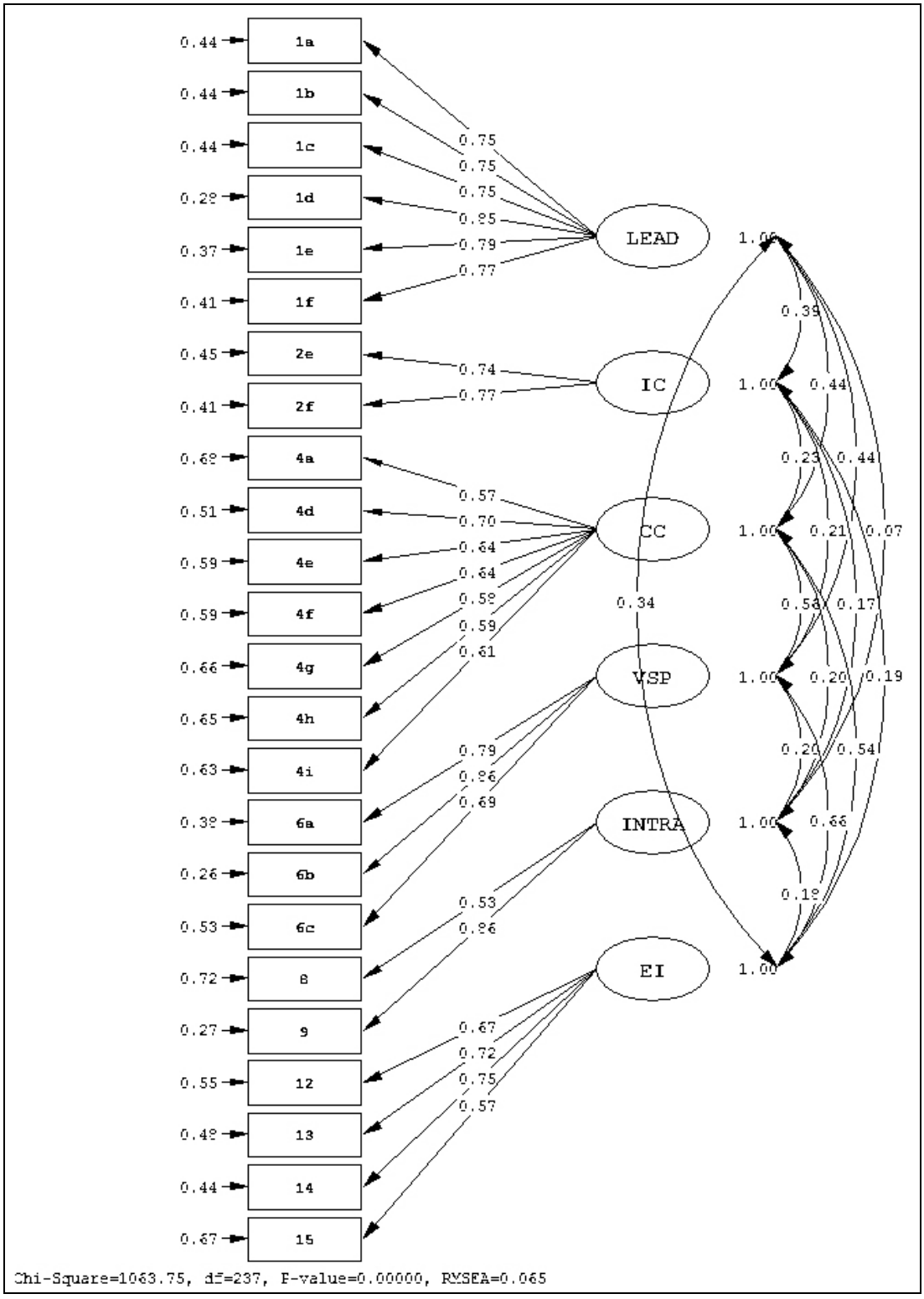

Diagram 8: Path diagram – 2009 Reduced model 2

From the LISREL analysis we find that all estimates are significant on a 1% level except the error variance for question 9 (t-value=1,53) and the correlation between INTRA and LEAD (t-value=1,66). Since The communalities for many of the variables are quite low, we must however conclude that the factor model is not particularly reliable.

The correlations between the factors vary. INTRA has low correlations with several factors. See details for the correlation coefficients for the factors in Appendix 12.

As in 2008 the highest correlation is between VSP and EI. The correlations are also high between CC and VSP (0,56) and between CC and EI (0,54). All three factors being classified as overall matters, as discussed in 5.3.4.

As in 2008, one of the lowest correlations is between Internal Communication (IC) and EI (0,19). On the whole, IC has low correlations with all the other factors and they are a bit lower than in 2008. The reason for this is not clear cut. One could perhaps think that the introduction of the extra factor “Intranet” could explain some of this, but the theoretical support for this is not very clear

5.4.5 Confirmatory factor analysis - Full model 2009

As for the 2008 dataset, we estimate the Measurement Model according to what was proposed by the original questionnaire. The factors and its variables are the same as for the full model in 2008.

The result can be viewed in Appendix 9. When running the full 2009 model in LISREL we get an RMSEA of 0,093 which is not acceptable, since it should be less than 0,08. The Goodness-Of-Fit (GFI) index is 0,76 and Adjusted GFI is 0,72 which are not satisfactory either. Relative Fit Index (RGFI) is 0,87 which is fairly good though since it is close to 0,9.

On the whole, the full model for 2009 has equal test statistics and almost as poor fit as the full model for 2008.

5.4.6 Comparing the full model with the reduced model - 2009

As in 2008 the reduced model for 2009 has a better fit than the full model. The analysis follows the same path in the sense that we in the reduced model have adjusted the composition of the question areas, and questions not being qualified enough to be part of the model, have been omitted. Again the coefficients for the variables belonging to the factors on Leadership (LEAD) and External Information (EI) are close to the coefficients for the variables belonging to the factors CL and SEW in the full model, due to the fact that these factors consist of the same questions respectively.

Similarly, as in 2008, the coefficients for the variables in other areas differ more, due to the changed composition of factors compared to the original question areas and the fact that we have omitted some questions.

5.4.7 Reflections on the 2009 analysis

The reasoning for the 2009 data set follows the same logic as for 2008. Our reduced model 2 has good test statistics and can be justified from the perspective of Communication issues. It is however strongly reduced with respect to the number of omitted variables. The explained variance is about the same as in 2008: 52,4%. The communalities for some of the variables

are also on the lower end. The original model is thus not supported by our analysis in favour of the reduced model. The reduced 2009 model consists of different variables than in 2008. Questions 4e, 4g, 8 and 9 are included as opposed to the reduced model for 2008, whereas questions 2c and 2d were omitted. The reduced model for 2009 provides a slightly better fit than the reduced 2008 model. In the next section we will try to interpret and compare the similarities and differences between the 2008 and 2009 results.

5.5 Comparison between results from 2008 and 2009 data

Table 5 below summarizes the compositions of the factors in the reduced models for 2008 and 2009.

	2008	2009
Factors	**Variables**	
Leadership	1a	1a
	1b	1b
	1c	1c
	1d	1d
	1e	1e
	1f	1f
Information among colleagues	2c	-
	2d	-
	2e	2e
	2f	2f
Communication Channels	4a	4a
	4d	4d
	-	4e
	4f	4f
	-	4g
	4h	4h
	4i	4i
Vision, Strategies and Policies	6a	6a
	6b	6b
	6c	6c
Intranet	-	8
	-	9
External information	12	12
	13	13
	14	14
	15	15

Table 5: Summary of variables and factors, reduced models 2008 and 2009

As can be seen in table 5, there is one more factor “Intranet” in 2009. Also the factors “Communication Channels” and “Information among colleagues” are composed differently.

In specific, in 2009 we have:
1) gained a factor concerning Intranet issues (8,9)
2) lost variables dealing with sharing of information (2c, 2d)
3) gained two variables on communication via telephone and Email (4e, 4g).

When speaking to the company's Vice President for HR, we learned that one possible explanation to some of these changes could be that the company has worked quite intensely in making its employees aware of how to use the Intranet and the importance thereof. This could explain the addition of questions 8 and 9 and thus item 1) above. If we assume that the Intranet is used and that its content is effective, there is less need to share information among colleagues since this is now dealt with through the Intranet, which could explain that the loadings of questions 2c and 2d have become lower. The communalities are however, as pointed out earlier, quite low for some of the variables, meaning that the estimated models are not completely reliable.

Question 4e was included in the 2009 reduced model 2, although it had loadings on two factors. Question 4g was included in the reduced model, although its loading was below 0,4. Based on these two facts, we cannot draw any definite conclusions regarding item 3).

6. Discussion on improvements and further areas of study

6.1 Response scales

The use of a four point scale may be considered to be subject to change. First of all it makes the questions a bit of a blunt instrument since it forces the respondents to "take sides" as discussed in section 3.2.2. Although some researchers find that a 4 point scale is preferable, there are other researchers who advocate extended response scales. (Trouth) A discussion on whether an altered response scale should be employed should definitely take place, although there is no absolute best choice.

Judging by the number of lost responses in questions 4 and 5, and the sometimes inconclusive results in the factor analysis for these questions, an extra response alternative should be considered: "Don't know". The outcome of this addition should be monitored carefully though, if this actually will generate more "Don't know" responses than the number of currently lost responses, as described by Trouth.

One issue that will arise if the response scales are to be changed is that the forthcoming results will not be comparable to previous results. If the company however is planning to continue to perform these surveys on communication, there will be opportunities for future comparisons if one keeps the questions intact.

The scales for questions 4, 8 or 9 could also be taken into consideration to be changed to the response scale: Totally disagree – Partly disagree – Partly Agree – Totally agree, in order to make them in accordance with the rest of the questionnaire. This would mean that all questions, after omitting the questions as per our analysis earlier, are responded to according to the same scale, which justifies the calculation of an overall average and performing factor analyses measuring overall agreement with the statements.

Question 4 could thus be rephrased to a statement instead of a question:

> *4. As I see it, the following communication channels/sources work well:*

Questions 8 and 9 could then be rephrased as follows:

> *8. Our Intranet is an important tool in retrieving information that I need for my work.*
>
> *9. The information I receive from the monthly CEO letter is valuable for me in my work.*

Question 16 could possibly be omitted from the questionnaire since the results from it is rather hard to interpret due to its ambiguous response scale. Question 3 could be kept as an overall question, used as a reference when computing a weighted overall satisfaction with communication issues based on all other questions.

6.2 Questions and question areas

In order to structure the future questionnaire in accordance with the findings from the analysis, it is suggested that the existing question areas should be changed.

The proposed questions and question areas are thus:

- Leadership (1a, 1b, 1c, 1d, 1e, 1f)
- Information among colleagues (2e, 2f)
- Communication channels (4a, 4d, 4e, 4f, 4g, 4h, 4i)
- Vision, Strategies and Policies (6a, 6b, 6c)
- Intranet (8,9)
- External information (12, 13, 14, 15)

Questions not contributing to the data set have been omitted following the reasoning in the previous analysis. In order to have a more thorough view for some of the areas it may be advisable to add some questions on “Information among colleagues”, “Intranet” and “Vision, Strategies and Policies”.

The questions on importance have also been omitted. Many of the questions 5a-5k are clearly correlated with their counterparts in question 4 and are thus not contributing that much. Questions 7a-7d on the other hand, do not seem to be correlated with questions 6a-6d. It is however questionable as to why these particular questions should be asked from an importance point of view, and no others.

6.3 Further areas of study

The data material for the two years provide far more opportunities for analyses than presented in this paper. Here follows three suggestions to what could be explored further.

1. Second order analysis in LISREL to determine the effects of the factors on overall satisfaction in communication issues. See diagram 9 below for the general principle for second order factor analysis. The Y-terms are the latent factors and Z_1 is the overall latent factor depending on Y_1 and Y_2. Z_1 would in our case be the overall satisfaction with communication, and Y_1 and Y_2 are the factors as described in section 6.2 above. With this Structural Equation Model we could fit a model and, given that it is significant, estimate the effects of the factors on overall satisfaction.

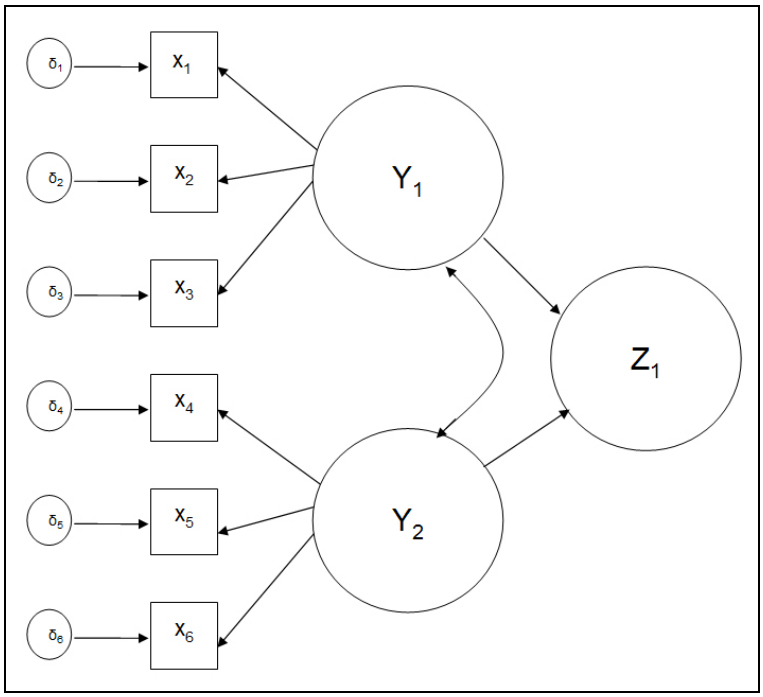

Diagram 9: Path diagram, General model, second order analysis.

2. The factor analysis could be performed for the different functions in the company, i.e. Multigroup Analysis as described in Sharma (1996). Comparisons could be made, and based on the proposed second order analysis, targeted actions could be suggested, based on our analysis.

3. If a new survey is to be designed, it could be evaluated according to the methods performed in this paper. Should the survey be performed repeatedly after its redesign, it could then be evaluated accordingly over time.

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Appendix 1: The questionnaire

Communicative leadership

1. Below you find a number of statements about managers' communication. To what extent do you agree or disagree to the following statements about your own manager?

	Totally disagree	Partly disagree	Partly agree	Totally agree
a) He/she gives the information I need for my daily work.	O	O	O	O
b) He/she gives me enough other general information.	O	O	O	O
c) He/she communicates in a structured way.	O	O	O	O
d) His/her communication is open, reliable and straightforward.	O	O	O	O
e) He/she is open for dialogue and constructive criticism.	O	O	O	O
f) He/she listens to my ideas and proposals.	O	O	O	O

Involved and committed employees

2. Below you find a number of statements. To what extent do you agree or disagree.	Totally disagree	Partly disagree	Partly Agree	Totally Agree
a) I know where to find necessary information for my daily work.	O	O	O	O
b) I know where to find necessary information about the company, such as vision, mission, strategies and objectives.	O	O	O	O
c) I consider my colleagues good at sharing important information with me.	O	O	O	O
d) I consider myself good at sharing important information with my colleagues.	O	O	O	O
e. I am regularly asked for information by my colleagues.	O	O	O	O
f) I regularly ask my colleagues for information.	O	O	O	O

Clear communication structure

	Totally disagree	Partly disagree	Partly agree	Totally agree
3. I consider our company's communication to be well functioning.	O	O	O	O

4. As you see it, <u>how well</u> do the following communication channels/sources work?	Very poor	Poor	Good	Very good
a) Intranet	O	O	O	O
b) Direct manager	O	O	O	O
c) Colleagues	O	O	O	O
d) Group meetings	O	O	O	O
e) E-mail	O	O	O	O
f) Seminars	O	O	O	O
g) Telephone	O	O	O	O
h) Notice board	O	O	O	O
i) Newsletter	O	O	O	O
k) External media	O	O	O	O
l) Rumours	O	O	O	O

	Not important at all	Not so important	Important	Very important
5. How important are the following communication channels for you?				
a) Intranet	O	O	O	O
b) Direct manager	O	O	O	O
c) Colleagues	O	O	O	O
d) Group meetings	O	O	O	O
e) E-mail	O	O	O	O
f) Seminars	O	O	O	O
g) Telephone	O	O	O	O
h) Notice board	O	O	O	O
i) Newsletter	O	O	O	O
k) External media	O	O	O	O
l) Rumours	O	O	O	O

	Totally disagree	Partly disagree	Partly agree	Totally agree
6. I consider myself well informed about…	O	O	O	O
a) …Vision, mission, objectives and strategies.	O	O	O	O
b) …Company policies and organization.	O	O	O	O
c) …HR related information.	O	O	O	O
d) …Market, competition and trends.	O	O	O	O

	Not important at all	Not so important	Important	Very important
7. How important is it for you to receive information about …	O	O	O	O
a) …Vision, mission, objectives and strategies.	O	O	O	O
b) …Company policies and organization.	O	O	O	O
c) …HR related information.	O	O	O	O
d) …Market, competition and trends.	O	O	O	O

Communication toolbox

	Never	Several times per month	Several times per week	Every day
8. I use the Intranet:	O	O	O	O

	Never	Rarely	Often	As soon as it is published
9. I read the monthly CEO letter:	O	O	O	O

	Totally disagree	Partly disagree	Partly agree	Totally agree
10. I consider my colleagues to be good at keeping up the rules for efficient e-mailing.	O	O	O	O
11. I consider meetings within our company as useful and well spent time.	O	O	O	O

Scanning the external world

	Totally disagree	Partly disagree	Partly agree	Totally agree
12. I know whom to turn to for information about trends and tendencies in the external world.	O	O	O	O
13. I receive external news about our company on a regular basis.	O	O	O	O
14. I regularly get information about external factors that influence the future of the company.	O	O	O	O
15. I consider myself having good knowledge of the expectations from the company's end customer.	O	O	O	O

Media relations

	Never	Rarely	Often	Very often
16. I read about/hear about our company in external media.	O	O	O	O

2008 Descriptives		1	2	3	4		Stddev	Mean	
	Communicative leadership	**Totally disagree**	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**			**Score questions**
1	Below you find a number of statements about managers' communication. To what extent do you agree or disagree to the following statements about your own manager?								**Other types of questions**
	a) He/she gives the information I need for my daily work.	23	62	287	323	3	0,77	3,31	
	b) He/she gives me enough other general information.	26	94	321	251	6	0,79	3,15	
	c) He/she communicates in a structured way.	38	111	249	292	8	0,88	3,15	
	d) His/her communication is open, reliable and straightforward.	27	82	226	355	8	0,83	3,32	
	e) He/she is open for dialogue and constructive criticism.	28	73	236	354	7	0,82	3,33	
	f) He/she listens to my ideas and proposals.	23	69	228	369	9	0,80	3,37	
	Involved and committed employees	**Totally disagree**	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**			
2	Below you find a number of statements. To what extent do								
	a) I know where to find necessary information for my daily work.	6	57	308	322	5	0,67	3,37	
	b) I know where to find necessary information about the company, such as vision, mission, strategies and objectives.	41	117	300	235	5	0,86	3,05	
	c) I consider my colleagues good at sharing important information with me.	23	87	289	293	6	0,79	3,23	
	d) I consider myself good at sharing important information with my colleagues.	8	20	300	365	5	0,61	3,47	
	e. I am regularly asked for information by my colleagues.	10	67	307	310	4	0,71	3,32	
	f) I regularly ask my colleagues for information.	10	62	315	307	4	0,70	3,32	
	Clear communication structure	**Totally disagree**	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**			
3	I consider Global Refund's communication to be well functioning	45	188	372	85	8	0,76	2,72	

4	As you see it, how well do the following communication channels/sources work?	**Very Poor**	**Poor**	**Good**	**Very Good**	**No Response**	**Stddev**	**Mean**
	a) Refundnet	65	182	347	81	23	0,81	2,66
	b) Direct manager	20	84	374	205	15	0,73	3,12
	c) Colleagues	11	67	388	224	8	0,67	3,20
	d) Group meetings	34	157	344	135	28	0,79	2,87
	e) E-mail	11	80	397	203	7	0,67	3,15
	f) Seminars	74	195	306	68	55	0,83	2,57
	g) Telephone	23	137	372	147	19	0,74	2,95
	h) Notice board	108	240	243	57	50	0,86	2,38
	i) Global News	76	201	328	64	29	0,82	2,57
	j) External media	123	254	235	34	52	0,83	2,28
	k) Rumours	146	232	223	56	41	0,91	2,29
5	How important are the following communication channels for you?	**Not important at all**	**Not so important**	**Important**	**Very important**	**No Response**		
	a) Refundnet	63	158	272	191	14	0,93	2,86
	b) Direct manager	5	25	188	473	7	0,59	3,63
	c) Colleagues	3	24	257	405	9	0,59	3,54
	d) Group meetings	14	87	296	283	18	0,75	3,25
	e) E-mail	2	30	293	364	9	0,60	3,48
	f) Seminars	40	171	295	160	32	0,85	2,86
	g) Telephone	25	97	301	260	15	0,80	3,17
	h) Notice board	93	223	259	89	34	0,89	2,52
	i) Global News	67	199	298	109	25	0,86	2,67
	j) External media	80	230	268	90	30	0,87	2,55
	k) Rumours	249	257	125	34	33	0,87	1,92
6	I consider myself well informed about…	**Totally disagree**	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**		
	a) …Vision, mission, objectives and strategies.	37	129	333	191	8	0,82	2,98
	b) …Company policies and organization.	42	143	363	142	8	0,80	2,88
	c) …HR related information.	74	225	305	77	17	0,83	2,57
	d) …Market, competition and trends.	67	200	311	108	12	0,86	2,67

7	How important is it for you to receive information about …	**Not important at all**	**Not so important**	**Important**	**Very important**	**No Response**	**Stddev**	**Mean**
	a) …Vision, mission, objectives and strategies.	3	66	260	364	5	0,68	3,42
	b) …Company policies and organization.	0	33	269	388	8	0,59	3,51
	c) …HR related information.	3	59	314	302	20	0,65	3,35
	d) …Market, competition and trends.	4	64	249	373	8	0,68	3,44
	Communication toolbox	**Never**	**Several times per month**	**Several times per week**	**Every day**	**No Response**		
8	I use Refundnet:	156	230	191	112	9	1,01	2,38
		Never	**Rarely**	**Often**	**As soon as it is published**	**No Response**		
9	I read the monthly CEO letter:	98	197	228	160	15	0,99	2,66
		Totally disagree	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**		
10	I consider my colleagues to be good at keeping up the rules fo	20	100	372	191	15	0,73	3,07
11	I consider meetings within Global Refund as useful and well sp	9	90	348	236	15	0,70	3,19
	Scanning the external world	**Totally disagree**	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**		
12	I know whom to turn to for information about trends and tende	42	177	328	138	13	0,82	2,82
13	I receive external news about Global Refund on a regular basis.	150	243	241	52	12	0,89	2,28
14	I regularly get information about external factors that influence the future of the company.	148	229	259	49	13	0,89	2,31
15	I consider myself having good knowledge of the expectations from Global Refund's end customer.	40	107	347	194	10	0,82	3,01
	Media relations	**Never**	**Rarely**	**Often**	**Very often**	**No Response**		
16	I read about/hear about Global Refund in external media.	153	420	106	15	4	0,68	1,98

2009 Descriptives		1	2	3	4		Stddev	Mean	
	Communicative leadership	**Totally disagree**	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**			**Score questions**
1	Below you find a number of statements about managers' communication. To what extent do you agree or disagree to the following statements about your own manager?								**Other types of questions**
	a) He/she gives the information I need for my daily work.	26	76	283	436	5	0,78	3,38	
	b) He/she gives me enough other general information.	25	77	347	372	5	0,76	3,30	
	c) He/she communicates in a structured way.	35	87	324	373	7	0,81	3,26	
	d) His/her communication is open, reliable and straightforward.	24	69	245	478	10	0,77	3,44	
	e) He/she is open for dialogue and constructive criticism.	27	69	266	454	10	0,78	3,41	
	f) He/she listens to my ideas and proposals.	17	58	245	496	10	0,72	3,50	
	Involved and committed employees	**Totally disagree**	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**			
2	Below you find a number of statements. To what extent do								
	a) I know where to find necessary information for my daily work.	12	43	298	466	7	0,67	3,49	
	b) I know where to find necessary information about the company, such as vision, mission, strategies and objectives.	25	85	342	362	12	0,77	3,28	
	c) I consider my colleagues good at sharing important information with me.	17	68	351	380	10	0,72	3,34	
	d) I consider myself good at sharing important information with my colleagues.	16	11	275	509	15	0,62	3,57	
	e. I am regularly asked for information by my colleagues.	21	48	319	425	13	0,72	3,41	
	f) I regularly ask my colleagues for information.	16	48	343	409	10	0,69	3,40	
	Clear communication structure	**Totally disagree**	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**			
3	I consider Global Refund's communication to be well functioning	40	153	426	196	11	0,79	2,95	

4	As you see it, how well do the following communication channels/sources work?	**Very Poor**	**Poor**	**Good**	**Very Good**		**Stddev**	**Mean**
	a) Intranet	36	132	500	119	39	0,70	2,89
	b) Direct manager	16	77	404	313	16	0,71	3,25
	c) Colleagues	7	63	432	314	10	0,64	3,29
	d) Group meetings	24	136	449	197	20	0,73	3,02
	e) E-mail	17	68	454	258	29	0,68	3,20
	f) Seminars	79	192	368	115	72	0,85	2,69
	g) Telephone	24	91	493	196	22	0,69	3,07
	h) Notice board	63	236	383	97	47	0,80	2,66
	i) Global News	57	197	429	93	50	0,77	2,72
	j) External media	89	275	341	57	64	0,80	2,48
	k) Rumours	140	283	279	61	63	0,87	2,34
5	How important are the following communication channels for you?	**Not important at all**	**Not so important**	**Important**	**Very important**	**No Response**		
	a) Intranet	42	158	363	227	36	0,84	2,98
	b) Direct manager	7	32	241	532	14	0,61	3,60
	c) Colleagues	2	28	272	513	11	0,57	3,59
	d) Group meetings	8	87	378	333	20	0,69	3,29
	e) E-mail	6	33	303	453	31	0,62	3,51
	f) Seminars	54	191	353	173	55	0,85	2,84
	g) Telephone	20	109	369	307	21	0,76	3,20
	h) Notice board	83	259	324	118	42	0,87	2,61
	i) Global News	46	208	394	138	40	0,80	2,79
	j) External media	47	271	353	113	42	0,79	2,68
	k) Rumours	268	291	175	53	39	0,91	2,02
6	I consider myself well informed about…	**Totally disagree**	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**		
	a) …Vision, mission, objectives and strategies.	23	129	429	230	15	0,74	3,07
	b) …Company policies and organization.	24	125	453	211	13	0,73	3,05
	c) …HR related information.	68	208	424	103	23	0,80	2,70
	d) …Market, competition and trends.	42	200	409	153	22	0,79	2,84

7	How important is it for you to receive information about …	**Not important at all**	**Not so important**	**Important**	**Very important**	**No Response**		
	a) …Vision, mission, objectives and strategies.	5	55	365	388	13	0,64	3,40
	b) …Company policies and organization.	4	28	351	432	11	0,59	3,49
	c) …HR related information.	13	87	382	321	23	0,71	3,26
	d) …Market, competition and trends.	8	66	333	402	17	0,68	3,40
	Communication toolbox	**Never**	**Several times per month**	**Several times per week**	**Every day**	**No Response**		
8	I use GRnet:	122	275	249	154	26	0,97	2,54
		Never	**Rarely**	**Often**	**As soon as it is published**	**No Response**		
9	I read the monthly CEO letter:	101	192	279	222	32	0,99	2,78
		Totally disagree	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**		
10	I consider my colleagues to be good at keeping up the rules fo	21	121	409	251	24	0,75	3,11
11	I consider meetings within Global Refund as useful and well sp	16	84	408	298	20	0,71	3,23
	Scanning the external world	**Totally disagree**	**Partly Disagree**	**Partly Agree**	**Totally Agree**	**No Response**		
12	I know whom to turn to for information about trends and tende	38	161	407	193	27	0,79	2,94
13	I receive external news about Global Refund on a regular basis.	139	255	306	97	29	0,92	2,45
14	I regularly get information about external factors that influence the future of the company.	107	243	344	106	26	0,88	2,56
15	I consider myself having good knowledge of the expectations from Global Refund's end customer.	29	93	397	290	17	0,77	3,17
	Media relations	**Never**	**Rarely**	**Often**	**Very often**	**No Response**		
16	I read about/hear about Global Refund in external media.	133	473	170	30	20	0,71	2,12

Appendix 4: Correlation matrix 2008

	1a	1b	1c	1d	1e	1f	2a	2b	2c	2d	2e	2f	3	4a	4b	4c	4d	4e
1a	1	,680	,606	,603	,541	,544	,398	,239	,324	,287	,161	,168	,410	,149	,486	,255	,246	,215
1b	,680	1	,627	,608	,582	,571	,368	,265	,347	,265	,162	,170	,460	,185	,561	,249	,302	,232
1c	,606	,627	1	,693	,608	,553	,355	,236	,286	,268	,241	,161	,453	,156	,505	,279	,256	,237
1d	,603	,608	,693	1	,730	,696	,311	,224	,265	,275	,166	,183	,381	,103	,474	,215	,287	,196
1e	,541	,582	,608	,730	1	,762	,287	,205	,274	,279	,155	,194	,352	,049	,445	,191	,231	,155
1f	,544	,571	,553	,696	,762	1	,328	,189	,276	,298	,203	,251	,355	,084	,444	,201	,272	,169
2a	,398	,368	,355	,311	,287	,328	1	,368	,405	,405	,246	,185	,342	,260	,255	,270	,222	,244
2b	,239	,265	,236	,224	,205	,189	,368	1	,300	,273	,212	,188	,359	,265	,205	,162	,215	,197
2c	,324	,347	,286	,265	,274	,276	,405	,300	1	,574	,314	,367	,472	,194	,243	,547	,240	,264
2d	,287	,265	,268	,275	,279	,298	,405	,273	,574	1	,424	,420	,290	,200	,176	,309	,106	,125
2e	,161	,162	,241	,166	,155	,203	,246	,212	,314	,424	1	,601	,153	,088	,088	,217	,073	,082
2f	,168	,170	,161	,183	,194	,251	,185	,188	,367	,420	,601	1	,181	,113	,111	,295	,153	,163
3	,410	,460	,453	,381	,352	,355	,342	,359	,472	,290	,153	,181	1	,375	,447	,431	,416	,387
4a	,149	,185	,156	,103	,049	,084	,260	,265	,194	,200	,088	,113	,375	1	,197	,198	,246	,299
4b	,486	,561	,505	,474	,445	,444	,255	,205	,243	,176	,088	,111	,447	,197	1	,393	,373	,304
4c	,255	,249	,279	,215	,191	,201	,270	,162	,547	,309	,217	,295	,431	,198	,393	1	,343	,347
4d	,246	,302	,256	,287	,231	,272	,222	,215	,240	,106	,073	,153	,416	,246	,373	,343	1	,335
4e	,215	,232	,237	,196	,155	,169	,244	,197	,264	,125	,082	,163	,387	,299	,304	,347	,335	1
4f	,152	,187	,170	,206	,175	,160	,133	,293	,127	,065	,116	,161	,356	,304	,243	,146	,503	,256
4g	,127	,200	,172	,144	,097	,136	,197	,198	,228	,182	,211	,245	,340	,244	,294	,357	,313	,411
4h	,172	,294	,226	,184	,184	,125	,192	,209	,265	,146	,096	,111	,433	,286	,250	,296	,321	,275
4i	,218	,237	,206	,168	,133	,099	,243	,234	,253	,169	,100	,123	,401	,442	,244	,246	,335	,312
4j	,141	,168	,109	,100	,100	,054	,145	,188	,184	,101	,054	,055	,316	,350	,183	,193	,208	,239
4k	-,037	-,035	,000	-,063	-,073	-,105	,044	-,031	,038	,071	,031	,047	-,007	,081	-,050	,054	-,076	-,003
5a	,115	,164	,125	,088	,072	,074	,138	,228	,190	,198	,107	,106	,240	,508	,175	,101	,154	,158
5b	,142	,150	,135	,155	,188	,143	,096	,076	,077	,123	,060	,113	,041	,013	,321	,078	,098	,039
5c	,158	,170	,159	,149	,132	,125	,108	,119	,330	,256	,198	,315	,190	,083	,215	,454	,168	,206
5d	,098	,109	,073	,100	,130	,123	,096	,120	,195	,211	,127	,212	,162	,096	,145	,180	,393	,153
5e	,133	,132	,089	,119	,133	,104	,118	,137	,171	,075	,038	,127	,183	,175	,196	,223	,192	,462
5f	,102	,116	,077	,064	,121	,079	,092	,120	,151	,151	,137	,188	,239	,207	,126	,159	,242	,121
5g	,052	,098	,094	,048	,074	,045	,146	,213	,194	,192	,232	,221	,199	,134	,182	,253	,065	,172
5h	,095	,165	,118	,084	,123	,054	,073	,086	,209	,178	,103	,123	,235	,186	,130	,159	,111	,131
5i	,168	,174	,131	,110	,130	,075	,159	,113	,250	,242	,133	,153	,258	,323	,168	,222	,192	,142
5j	,118	,096	,091	,071	,092	,050	,045	,197	,156	,174	,119	,126	,170	,183	,108	,111	,084	,062
5k	,089	,080	,120	,001	,022	,006	,082	-,004	,135	,142	,114	,065	,091	,125	,010	,113	-,011	,072
6a	,211	,336	,285	,266	,266	,255	,228	,599	,287	,263	,172	,183	,365	,151	,328	,184	,283	,128
6b	,242	,355	,316	,278	,289	,290	,285	,482	,326	,263	,158	,156	,473	,170	,370	,272	,301	,200
6c	,246	,317	,306	,230	,218	,205	,227	,411	,270	,134	,135	,132	,445	,261	,308	,248	,329	,181
6d	,246	,273	,255	,241	,220	,220	,273	,444	,255	,179	,099	,133	,378	,229	,267	,260	,333	,229
7a	,094	,090	,069	,025	,128	,065	,081	,124	,102	,131	,127	,134	,065	,080	,080	,075	,103	,078
7b	,085	,072	,075	,077	,119	,128	,030	,102	,073	,124	,133	,144	,020	,037	,092	,069	,131	,059
7c	,019	,044	,044	,019	,048	,012	-,044	,066	,025	,115	,090	,057	-,009	,048	,011	,054	,070	,026
7d	,025	,034	,010	,008	,014	,029	-,029	,134	,058	,117	,066	,087	,019	-,015	,016	,049	,111	,023
8	-,035	,003	-,015	-,023	-,014	-,022	,008	,147	-,032	,037	,047	,024	,035	,297	,023	-,101	-,001	,023
9	-,020	-,007	-,018	,004	,046	,072	-,006	,129	-,090	-,008	,089	,095	-,076	,071	,047	-,064	,062	,002
10	,213	,271	,271	,193	,180	,178	,269	,173	,353	,255	,141	,194	,397	,325	,234	,438	,279	,440
11	,236	,233	,235	,180	,218	,190	,170	,172	,222	,145	,086	,104	,357	,165	,216	,215	,383	,215
12	,176	,203	,186	,182	,193	,156	,229	,277	,161	,121	,083	,094	,304	,203	,246	,214	,174	,193
13	,114	,188	,156	,106	,110	,056	,162	,299	,267	,145	,085	,113	,362	,262	,172	,196	,186	,229
14	,178	,221	,169	,151	,135	,086	,148	,311	,214	,070	-,002	,094	,377	,227	,203	,206	,274	,244
15	,149	,196	,149	,159	,118	,131	,238	,287	,220	,185	,096	,128	,308	,191	,223	,208	,204	,207
16	,112	,155	,134	,068	,050	,024	,118	,208	,148	,052	,026	,067	,253	,217	,169	,164	,178	,165

	4f	4g	4h	4i	4j	4k	5a	5b	5c	5d	5e	5f	5g	5h	5i	5j	5k	6a
1a	,152	,127	,172	,218	,141	-,037	,115	,142	,158	,098	,133	,102	,052	,095	,168	,118	,089	,211
1b	,187	,200	,294	,237	,168	-,035	,164	,150	,170	,109	,132	,116	,098	,165	,174	,096	,080	,336
1c	,170	,172	,226	,206	,109	,000	,125	,135	,159	,073	,089	,077	,094	,118	,131	,091	,120	,285
1d	,206	,144	,184	,168	,100	-,063	,088	,155	,149	,100	,119	,064	,048	,084	,110	,071	,001	,266
1e	,175	,097	,184	,133	,100	-,073	,072	,188	,132	,130	,133	,121	,074	,123	,130	,092	,022	,266
1f	,160	,136	,125	,099	,054	-,105	,074	,143	,125	,123	,104	,079	,045	,054	,075	,050	,006	,255
2a	,133	,197	,192	,243	,145	,044	,138	,096	,108	,096	,118	,092	,146	,073	,159	,045	,082	,228
2b	,293	,198	,209	,234	,188	-,031	,228	,076	,119	,120	,137	,120	,213	,086	,113	,197	-,004	,599
2c	,127	,228	,265	,253	,184	,038	,190	,077	,330	,195	,171	,151	,194	,209	,250	,156	,135	,287
2d	,065	,182	,146	,169	,101	,071	,198	,123	,256	,211	,075	,151	,192	,178	,242	,174	,142	,263
2e	,116	,211	,096	,100	,054	,031	,107	,060	,198	,127	,038	,137	,232	,103	,133	,119	,114	,172
2f	,161	,245	,111	,123	,055	,047	,106	,113	,315	,212	,127	,188	,221	,123	,153	,126	,065	,183
3	,356	,340	,433	,401	,316	-,007	,240	,041	,190	,162	,183	,239	,199	,235	,258	,170	,091	,365
4a	,304	,244	,286	,442	,350	,081	,508	,013	,083	,096	,175	,207	,134	,186	,323	,183	,125	,151
4b	,243	,294	,250	,244	,183	-,050	,175	,321	,215	,145	,196	,126	,182	,130	,168	,108	,010	,328
4c	,146	,357	,296	,246	,193	,054	,101	,078	,454	,180	,223	,159	,253	,159	,222	,111	,113	,184
4d	,503	,313	,321	,335	,208	-,076	,154	,098	,168	,393	,192	,242	,065	,111	,192	,084	-,011	,283
4e	,256	,411	,275	,312	,239	-,003	,158	,039	,206	,153	,462	,121	,172	,131	,142	,062	,072	,128
4f	1	,350	,414	,425	,366	,050	,167	,122	,081	,234	,189	,348	,195	,115	,163	,155	,031	,295
4g	,350	1	,372	,313	,261	,112	,143	,094	,206	,123	,256	,147	,546	,163	,141	,119	,099	,236
4h	,414	,372	1	,603	,462	,120	,167	-,019	,133	,134	,110	,211	,165	,471	,285	,157	,207	,212
4i	,425	,313	,603	1	,593	,129	,285	-,011	,055	,213	,182	,253	,158	,310	,472	,260	,145	,203
4j	,366	,261	,462	,593	1	,257	,146	-,060	,060	,084	,195	,095	,159	,181	,283	,343	,220	,135
4k	,050	,112	,120	,129	,257	1	-,037	-,014	,076	-,017	,012	-,064	,061	,049	-,044	,074	,550	-,015
5a	,167	,143	,167	,285	,146	-,037	1	,200	,115	,205	,121	,290	,163	,299	,442	,278	,055	,237
5b	,122	,094	-,019	-,011	-,060	-,014	,200	1	,336	,281	,153	,211	,165	,079	,149	,161	-,045	,151
5c	,081	,206	,133	,055	,060	,076	,115	,336	1	,333	,289	,167	,249	,147	,168	,131	,111	,118
5d	,234	,123	,134	,213	,084	-,017	,205	,281	,333	1	,227	,487	,147	,302	,329	,269	,027	,190
5e	,189	,256	,110	,182	,195	,012	,121	,153	,289	,227	1	,213	,333	,077	,088	,124	,114	,049
5f	,348	,147	,211	,253	,095	-,064	,290	,211	,167	,487	,213	1	,288	,398	,394	,363	,032	,238
5g	,195	,546	,165	,158	,159	,061	,163	,165	,249	,147	,333	,288	1	,247	,161	,230	,052	,287
5h	,115	,163	,471	,310	,181	,049	,299	,079	,147	,302	,077	,398	,247	1	,588	,454	,129	,188
5i	,163	,141	,285	,472	,283	-,044	,442	,149	,168	,329	,088	,394	,161	,588	1	,521	,094	,128
5j	,155	,119	,157	,260	,343	,074	,278	,161	,131	,269	,124	,363	,230	,454	,521	1	,164	,234
5k	,031	,099	,207	,145	,220	,550	,055	-,045	,111	,027	,114	,032	,052	,129	,094	,164	1	,004
6a	,295	,236	,212	,203	,135	-,015	,237	,151	,118	,190	,049	,238	,287	,188	,128	,234	,004	1
6b	,267	,287	,290	,219	,195	-,037	,175	,149	,144	,186	,099	,192	,218	,199	,133	,189	,039	,672
6c	,363	,269	,374	,327	,308	,003	,168	,069	,117	,176	,130	,190	,215	,190	,179	,209	,067	,508
6d	,319	,304	,318	,271	,265	-,016	,175	,061	,098	,173	,159	,234	,247	,211	,154	,219	,069	,517
7a	,096	,129	,017	,089	,027	-,038	,259	,238	,164	,290	,156	,306	,206	,147	,233	,229	-,021	,255
7b	,100	,101	-,017	,040	-,025	-,073	,200	,241	,202	,286	,138	,244	,164	,125	,178	,214	-,011	,224
7c	,084	,078	-,002	,038	,020	-,011	,213	,199	,149	,250	,133	,258	,170	,152	,172	,223	,054	,133
7d	,107	,071	,014	,020	-,012	-,036	,144	,219	,176	,257	,084	,226	,153	,139	,169	,260	,021	,192
8	,044	,002	-,002	,073	-,002	-,032	,538	,140	-,023	,040	,066	,144	,090	,052	,103	,117	,011	,130
9	,190	,072	-,045	,035	-,036	-,071	,270	,198	,064	,131	,004	,130	,116	-,005	,023	,058	-,091	,166
10	,145	,260	,265	,301	,223	,002	,196	-,013	,233	,109	,304	,189	,147	,194	,256	,092	,144	,128
11	,258	,199	,255	,249	,136	-,086	,210	,076	,191	,353	,164	,336	,151	,247	,266	,145	,004	,266
12	,261	,263	,251	,253	,322	,084	,184	,155	,116	,168	,116	,217	,180	,166	,196	,204	,071	,292
13	,225	,197	,355	,359	,388	,115	,201	-,018	,065	,143	,149	,197	,121	,264	,227	,242	,153	,332
14	,283	,233	,414	,366	,355	,051	,187	,036	,104	,160	,152	,183	,134	,212	,170	,183	,073	,348
15	,186	,225	,226	,241	,194	-,007	,209	,082	,126	,117	,174	,152	,237	,099	,130	,093	,040	,340
16	,230	,163	,285	,315	,369	,123	,166	,027	,104	,144	,106	,158	,121	,199	,164	,202	,158	,210

	6b	6c	6d	7a	7b	7c	7d	8	9	10	11	12	13	14	15	16
1a	,242	,246	,246	,094	,085	,019	,025	-,035	-,020	,213	,236	,176	,114	,178	,149	,112
1b	,355	,317	,273	,090	,072	,044	,034	,003	-,007	,271	,233	,203	,188	,221	,196	,155
1c	,316	,306	,255	,069	,075	,044	,010	-,015	-,018	,271	,235	,186	,156	,169	,149	,134
1d	,278	,230	,241	,025	,077	,019	,008	-,023	,004	,193	,180	,182	,106	,151	,159	,068
1e	,289	,218	,220	,128	,119	,048	,014	-,014	,046	,180	,218	,193	,110	,135	,118	,050
1f	,290	,205	,220	,065	,128	,012	,029	-,022	,072	,178	,190	,156	,056	,086	,131	,024
2a	,285	,227	,273	,081	,030	-,044	-,029	,008	-,006	,269	,170	,229	,162	,148	,238	,118
2b	,482	,411	,444	,124	,102	,066	,134	,147	,129	,173	,172	,277	,299	,311	,287	,208
2c	,326	,270	,255	,102	,073	,025	,058	-,032	-,090	,353	,222	,161	,267	,214	,220	,148
2d	,263	,134	,179	,131	,124	,115	,117	,037	-,008	,255	,145	,121	,145	,070	,185	,052
2e	,158	,135	,099	,127	,133	,090	,066	,047	,089	,141	,086	,083	,085	-,002	,096	,026
2f	,156	,132	,133	,134	,144	,057	,087	,024	,095	,194	,104	,094	,113	,094	,128	,067
3	,473	,445	,378	,065	,020	-,009	,019	,035	-,076	,397	,357	,304	,362	,377	,308	,253
4a	,170	,261	,229	,080	,037	,048	-,015	,297	,071	,325	,165	,203	,262	,227	,191	,217
4b	,370	,308	,267	,080	,092	,011	,016	,023	,047	,234	,216	,246	,172	,203	,223	,169
4c	,272	,248	,260	,075	,069	,054	,049	-,101	-,064	,438	,215	,214	,196	,206	,208	,164
4d	,301	,329	,333	,103	,131	,070	,111	-,001	,062	,279	,383	,174	,186	,274	,204	,178
4e	,200	,181	,229	,078	,059	,026	,023	,023	,002	,440	,215	,193	,229	,244	,207	,165
4f	,267	,363	,319	,096	,100	,084	,107	,044	,190	,145	,258	,261	,225	,283	,186	,230
4g	,287	,269	,304	,129	,101	,078	,071	,002	,072	,260	,199	,263	,197	,233	,225	,163
4h	,290	,374	,318	,017	-,017	-,002	,014	-,002	-,045	,265	,255	,251	,355	,414	,226	,285
4i	,219	,327	,271	,089	,040	,038	,020	,073	,035	,301	,249	,253	,359	,366	,241	,315
4j	,195	,308	,265	,027	-,025	,020	-,012	-,002	-,036	,223	,136	,322	,388	,355	,194	,369
4k	-,037	,003	-,016	-,038	-,073	-,011	-,036	-,032	-,071	,002	-,086	,084	,115	,051	-,007	,123
5a	,175	,168	,175	,259	,200	,213	,144	,538	,270	,196	,210	,184	,201	,187	,209	,166
5b	,149	,069	,061	,238	,241	,199	,219	,140	,198	-,013	,076	,155	-,018	,036	,082	,027
5c	,144	,117	,098	,164	,202	,149	,176	-,023	,064	,233	,191	,116	,065	,104	,126	,104
5d	,186	,176	,173	,290	,286	,250	,257	,040	,131	,109	,353	,168	,143	,160	,117	,144
5e	,099	,130	,159	,156	,138	,133	,084	,066	,004	,304	,164	,116	,149	,152	,174	,106
5f	,192	,190	,234	,306	,244	,258	,226	,144	,130	,189	,336	,217	,197	,183	,152	,158
5g	,218	,215	,247	,206	,164	,170	,153	,090	,116	,147	,151	,180	,121	,134	,237	,121
5h	,199	,190	,211	,147	,125	,152	,139	,052	-,005	,194	,247	,166	,264	,212	,099	,199
5i	,133	,179	,154	,233	,178	,172	,169	,103	,023	,256	,266	,196	,227	,170	,130	,164
5j	,189	,209	,219	,229	,214	,223	,260	,117	,058	,092	,145	,204	,242	,183	,093	,202
5k	,039	,067	,069	-,021	-,011	,054	,021	,011	-,091	,144	,004	,071	,153	,073	,040	,158
6a	,672	,508	,517	,255	,224	,133	,192	,130	,166	,128	,266	,292	,332	,348	,340	,210
6b	1	,577	,513	,167	,150	,033	,095	,071	,113	,214	,274	,341	,322	,391	,307	,247
6c	,577	1	,548	,118	,104	,151	,105	,034	,106	,155	,223	,309	,342	,460	,224	,293
6d	,513	,548	1	,114	,090	,089	,296	,076	,135	,194	,269	,426	,328	,470	,438	,323
7a	,167	,118	,114	1	,618	,492	,513	,167	,244	,107	,216	,090	,118	,054	,121	,060
7b	,150	,104	,090	,618	1	,571	,471	,126	,241	,061	,146	,075	,058	,030	,048	,017
7c	,033	,151	,089	,492	,571	1	,503	,129	,157	,046	,078	,006	,047	,015	,036	,030
7d	,095	,105	,296	,513	,471	,503	1	,081	,231	,030	,120	,132	,078	,084	,145	,104
8	,071	,034	,076	,167	,126	,129	,081	1	,407	,056	,055	,066	,054	,078	,095	,102
9	,113	,106	,135	,244	,241	,157	,231	,407	1	,017	,093	,123	-,042	,084	,057	,056
10	,214	,155	,194	,107	,061	,046	,030	,056	,017	1	,341	,190	,235	,195	,235	,159
11	,274	,223	,269	,216	,146	,078	,120	,055	,093	,341	1	,252	,229	,273	,210	,165
12	,341	,309	,426	,090	,075	,006	,132	,066	,123	,190	,252	1	,379	,429	,360	,327
13	,322	,342	,328	,118	,058	,047	,078	,054	-,042	,235	,229	,379	1	,624	,334	,394
14	,391	,460	,470	,054	,030	,015	,084	,078	,084	,195	,273	,429	,624	1	,372	,401
15	,307	,224	,438	,121	,048	,036	,145	,095	,057	,235	,210	,360	,334	,372	1	,281
16	,247	,293	,323	,060	,017	,030	,104	,102	,056	,159	,165	,327	,394	,401	,281	1

Appendix 5: Correlation matrix 2009

	1a	1b	1c	1d	1e	1f	2a	2b	2c	2d	2e	2f	3	4a	4b	4c	4d	4e
1a	1	,719	,578	,621	,527	,496	,374	,261	,365	,362	,209	,252	,412	,117	,504	,240	,302	,213
1b	,719	1	,556	,612	,534	,540	,380	,281	,342	,365	,197	,231	,394	,167	,513	,208	,300	,229
1c	,578	,556	1	,652	,584	,542	,369	,302	,380	,375	,189	,222	,441	,167	,508	,271	,311	,277
1d	,621	,612	,652	1	,701	,662	,418	,309	,337	,393	,231	,216	,387	,139	,497	,206	,296	,227
1e	,527	,534	,584	,701	1	,707	,326	,301	,296	,377	,250	,207	,349	,156	,438	,168	,259	,193
1f	,496	,540	,542	,662	,707	1	,404	,319	,354	,425	,267	,271	,342	,174	,407	,207	,276	,226
2a	,374	,380	,369	,418	,326	,404	1	,493	,425	,454	,285	,236	,388	,276	,264	,274	,229	,227
2b	,261	,281	,302	,309	,301	,319	,493	1	,390	,361	,212	,207	,372	,321	,215	,194	,216	,211
2c	,365	,342	,380	,337	,296	,354	,425	,390	1	,559	,280	,298	,502	,261	,274	,507	,304	,323
2d	,362	,365	,375	,393	,377	,425	,454	,361	,559	1	,359	,362	,326	,181	,155	,293	,141	,178
2e	,209	,197	,189	,231	,250	,267	,285	,212	,280	,359	1	,568	,152	,093	,135	,154	,108	,087
2f	,252	,231	,222	,216	,207	,271	,236	,207	,298	,362	,568	1	,231	,090	,111	,141	,125	,145
3	,412	,394	,441	,387	,349	,342	,388	,372	,502	,326	,152	,231	1	,351	,408	,354	,369	,430
4a	,117	,167	,167	,139	,156	,174	,276	,321	,261	,181	,093	,090	,351	1	,224	,281	,363	,394
4b	,504	,513	,508	,497	,438	,407	,264	,215	,274	,155	,135	,111	,408	,224	1	,402	,481	,297
4c	,240	,208	,271	,206	,168	,207	,274	,194	,507	,293	,154	,141	,354	,281	,402	1	,389	,356
4d	,302	,300	,311	,296	,259	,276	,229	,216	,304	,141	,108	,125	,369	,363	,481	,389	1	,492
4e	,213	,229	,277	,227	,193	,226	,227	,211	,323	,178	,087	,145	,430	,394	,297	,356	,492	1
4f	,239	,225	,254	,264	,268	,243	,171	,267	,231	,123	,119	,134	,317	,353	,343	,237	,526	,337
4g	,169	,229	,214	,207	,221	,220	,226	,238	,269	,170	,130	,191	,331	,320	,329	,328	,417	,429
4h	,186	,236	,228	,134	,147	,113	,178	,160	,257	,167	,058	,077	,377	,325	,284	,274	,352	,366
4i	,184	,207	,229	,132	,187	,152	,195	,269	,292	,189	,046	,086	,417	,361	,245	,258	,343	,388
4j	,141	,160	,154	,093	,093	,068	,123	,215	,251	,146	,012	,074	,330	,388	,222	,256	,341	,373
4k	,020	,038	-,028	-,025	,000	-,028	,022	,073	,069	,049	,125	,098	,073	,147	-,022	,043	,058	,080
5a	,131	,088	,098	,049	,114	,076	,130	,223	,098	,087	,098	,066	,132	,337	,064	,048	,063	,069
5b	,205	,229	,176	,233	,250	,220	,185	,183	,149	,115	,160	,126	,100	,096	,363	,152	,193	,074
5c	,153	,138	,142	,215	,208	,189	,206	,177	,238	,189	,174	,243	,179	,139	,204	,415	,257	,210
5d	,168	,154	,188	,189	,223	,155	,156	,189	,094	,145	,202	,190	,179	,111	,165	,075	,358	,200
5e	,163	,184	,170	,166	,191	,200	,147	,127	,131	,114	,106	,143	,217	,147	,194	,128	,236	,444
5f	,107	,036	,113	,095	,142	,056	,075	,129	,128	,118	,096	,136	,183	,125	,070	,076	,191	,101
5g	,106	,120	,131	,137	,147	,125	,138	,156	,175	,127	,128	,131	,190	,118	,146	,187	,177	,160
5h	,104	,102	,144	,076	,121	,074	,124	,068	,114	,143	,096	,061	,257	,189	,094	,098	,126	,159
5i	,143	,116	,189	,102	,140	,071	,145	,168	,169	,194	,083	,111	,268	,223	,103	,148	,141	,180
5j	,117	,109	,140	,112	,125	,100	,093	,170	,162	,119	,090	,119	,207	,220	,125	,111	,144	,169
5k	,102	,072	,061	-,004	,031	,008	,023	,027	,095	,044	,085	,114	,160	,062	,062	,114	,107	,092
6a	,264	,245	,289	,265	,237	,209	,273	,479	,229	,194	,147	,148	,329	,255	,317	,159	,288	,188
6b	,319	,332	,335	,315	,270	,237	,355	,425	,261	,171	,111	,140	,378	,297	,337	,206	,345	,259
6c	,247	,274	,307	,231	,215	,220	,277	,325	,276	,165	,083	,129	,403	,296	,310	,247	,351	,292
6d	,162	,207	,162	,124	,110	,174	,231	,316	,183	,124	,066	,122	,296	,281	,260	,164	,285	,220
7a	,153	,105	,126	,128	,156	,152	,143	,165	,115	,149	,160	,167	,099	,115	,095	-,015	,124	,073
7b	,117	,101	,092	,145	,144	,173	,128	,180	,088	,146	,173	,144	,112	,105	,095	-,002	,130	,099
7c	,095	,061	,048	,096	,092	,117	,099	,099	,072	,079	,118	,078	,074	,091	,082	,025	,081	,077
7d	,142	,114	,190	,200	,186	,216	,167	,199	,142	,175	,109	,123	,096	,160	,137	,012	,111	,087
8	,015	,013	,020	,004	,080	,073	,048	,160	,021	,011	,064	,017	-,026	,268	,043	,017	,030	,051
9	,074	,029	,044	,018	,075	,055	,082	,153	,001	-,005	,110	,115	-,063	,170	,069	-,011	,114	,066
10	,179	,186	,267	,206	,202	,243	,262	,180	,368	,259	,059	,121	,327	,318	,226	,391	,356	,476
11	,254	,249	,315	,295	,276	,296	,252	,266	,248	,163	,101	,157	,337	,201	,305	,227	,390	,317
12	,186	,209	,216	,202	,212	,225	,214	,288	,168	,104	,087	,110	,244	,282	,293	,143	,262	,207
13	,182	,214	,193	,111	,109	,088	,170	,214	,133	,068	,087	,073	,278	,276	,254	,155	,265	,233
14	,206	,230	,180	,190	,133	,136	,175	,262	,099	,007	,071	,093	,243	,222	,265	,127	,241	,191
15	,249	,266	,281	,258	,192	,197	,315	,278	,173	,148	,180	,156	,272	,217	,241	,191	,228	,186
16	,087	,055	,113	,060	,083	,067	,088	,160	,041	,015	,128	,109	,163	,212	,122	,040	,136	,179

	4f	4g	4h	4i	4j	4k	5a	5b	5c	5d	5e	5f	5g	5h	5i	5j	5k	6a
1a	,239	,169	,186	,184	,141	,020	,131	,205	,153	,168	,163	,107	,106	,104	,143	,117	,102	,264
1b	,225	,229	,236	,207	,160	,038	,088	,229	,138	,154	,184	,036	,120	,102	,116	,109	,072	,245
1c	,254	,214	,228	,229	,154	-,028	,098	,176	,142	,188	,170	,113	,131	,144	,189	,140	,061	,289
1d	,264	,207	,134	,132	,093	-,025	,049	,233	,215	,189	,166	,095	,137	,076	,102	,112	-,004	,265
1e	,268	,221	,147	,187	,093	,000	,114	,250	,208	,223	,191	,142	,147	,121	,140	,125	,031	,237
1f	,243	,220	,113	,152	,068	-,028	,076	,220	,189	,155	,200	,056	,125	,074	,071	,100	,008	,209
2a	,171	,226	,178	,195	,123	,022	,130	,185	,206	,156	,147	,075	,138	,124	,145	,093	,023	,273
2b	,267	,238	,160	,269	,215	,073	,223	,183	,177	,189	,127	,129	,156	,068	,168	,170	,027	,479
2c	,231	,269	,257	,292	,251	,069	,098	,149	,238	,094	,131	,128	,175	,114	,169	,162	,095	,229
2d	,123	,170	,167	,189	,146	,049	,087	,115	,189	,145	,114	,118	,127	,143	,194	,119	,044	,194
2e	,119	,130	,058	,046	,012	,125	,098	,160	,174	,202	,106	,096	,128	,096	,083	,090	,085	,147
2f	,134	,191	,077	,086	,074	,098	,066	,126	,243	,190	,143	,136	,131	,061	,111	,119	,114	,148
3	,317	,331	,377	,417	,330	,073	,132	,100	,179	,179	,217	,183	,190	,257	,268	,207	,160	,329
4a	,353	,320	,325	,361	,388	,147	,337	,096	,139	,111	,147	,125	,118	,189	,223	,220	,062	,255
4b	,343	,329	,284	,245	,222	-,022	,064	,363	,204	,165	,194	,070	,146	,094	,103	,125	,062	,317
4c	,237	,328	,274	,258	,256	,043	,048	,152	,415	,075	,128	,076	,187	,098	,148	,111	,114	,159
4d	,526	,417	,352	,343	,341	,058	,063	,193	,257	,358	,236	,191	,177	,126	,141	,144	,107	,288
4e	,337	,429	,366	,388	,373	,080	,069	,074	,210	,200	,444	,101	,160	,159	,180	,169	,092	,188
4f	1	,376	,353	,357	,406	,097	,189	,201	,118	,218	,146	,328	,165	,122	,209	,207	,107	,305
4g	,376	1	,324	,315	,330	,145	,144	,178	,265	,213	,277	,213	,509	,140	,185	,200	,124	,270
4h	,353	,324	1	,548	,449	,217	,197	,061	,127	,230	,175	,190	,091	,532	,357	,252	,217	,196
4i	,357	,315	,548	1	,587	,227	,174	,059	,129	,163	,155	,168	,069	,316	,472	,260	,174	,240
4j	,406	,330	,449	,587	1	,376	,126	,057	,101	,117	,172	,207	,151	,254	,342	,438	,276	,208
4k	,097	,145	,217	,227	,376	1	,043	,016	,096	,055	,092	,140	,110	,182	,126	,199	,521	,042
5a	,189	,144	,197	,174	,126	,043	1	,189	,124	,184	,175	,283	,157	,297	,318	,207	,115	,193
5b	,201	,178	,061	,059	,057	,016	,189	1	,372	,315	,207	,185	,184	,091	,085	,090	,020	,248
5c	,118	,265	,127	,129	,101	,096	,124	,372	1	,359	,312	,155	,289	,087	,135	,125	,135	,171
5d	,218	,213	,230	,163	,117	,055	,184	,315	,359	1	,289	,432	,220	,314	,275	,239	,167	,213
5e	,146	,277	,175	,155	,172	,092	,175	,207	,312	,289	1	,195	,338	,153	,166	,200	,133	,113
5f	,328	,213	,190	,168	,207	,140	,283	,185	,155	,432	,195	1	,307	,424	,462	,341	,212	,176
5g	,165	,509	,091	,069	,151	,110	,157	,184	,289	,220	,338	,307	1	,174	,186	,246	,179	,218
5h	,122	,140	,532	,316	,254	,182	,297	,091	,087	,314	,153	,424	,174	1	,569	,405	,273	,108
5i	,209	,185	,357	,472	,342	,126	,318	,085	,135	,275	,166	,462	,186	,569	1	,533	,236	,204
5j	,207	,200	,252	,260	,438	,199	,207	,090	,125	,239	,200	,341	,246	,405	,533	1	,312	,157
5k	,107	,124	,217	,174	,276	,521	,115	,020	,135	,167	,133	,212	,179	,273	,236	,312	1	,103
6a	,305	,270	,196	,240	,208	,042	,193	,248	,171	,213	,113	,176	,218	,108	,204	,157	,103	1
6b	,310	,274	,245	,283	,230	,054	,172	,215	,174	,200	,156	,141	,199	,123	,151	,142	,081	,694
6c	,350	,241	,316	,350	,314	,091	,156	,135	,144	,146	,179	,168	,157	,215	,242	,197	,147	,515
6d	,225	,250	,228	,243	,332	,099	,157	,122	,124	,128	,181	,166	,234	,158	,226	,221	,110	,503
7a	,183	,169	,056	,118	,109	,054	,291	,242	,141	,365	,146	,306	,212	,206	,320	,285	,089	,294
7b	,242	,162	,023	,104	,104	,057	,235	,293	,151	,332	,155	,238	,182	,145	,193	,201	,043	,243
7c	,172	,077	,027	,075	,049	,053	,241	,287	,139	,262	,138	,237	,186	,186	,217	,157	,076	,169
7d	,168	,126	,000	,042	,116	,037	,187	,267	,149	,237	,174	,248	,254	,133	,220	,287	,055	,266
8	,148	,068	-,013	,042	,021	,049	,541	,080	,059	-,032	,074	,094	,059	-,022	,058	-,008	-,007	,113
9	,218	,089	,007	,054	,022	-,013	,292	,177	,061	,098	,057	,122	,079	-,018	,049	,008	-,080	,165
10	,197	,273	,294	,313	,272	,066	,073	,093	,275	,144	,330	,116	,173	,176	,212	,123	,076	,229
11	,304	,317	,291	,270	,205	,011	,150	,236	,237	,383	,302	,251	,229	,246	,249	,163	,140	,262
12	,317	,239	,186	,220	,272	,084	,143	,168	,128	,167	,129	,199	,179	,148	,187	,271	,100	,399
13	,258	,197	,373	,331	,404	,204	,163	,082	,073	,127	,151	,223	,148	,350	,308	,301	,176	,320
14	,222	,143	,226	,226	,307	,148	,088	,077	,063	,147	,070	,115	,120	,174	,174	,277	,125	,386
15	,184	,211	,214	,173	,142	,094	,136	,182	,185	,145	,139	,181	,236	,200	,189	,196	,076	,390
16	,142	,104	,183	,192	,344	,180	,141	,052	,046	,131	,126	,175	,112	,208	,226	,280	,166	,237

	6b	6b	6c	6d	7a	7b	7c	7d	8	9	10	11	12	13	14	15	16
1a	,319	,319	,247	,162	,153	,117	,095	,142	,015	,074	,179	,254	,186	,182	,206	,249	,087
1b	,332	,332	,274	,207	,105	,101	,061	,114	,013	,029	,186	,249	,209	,214	,230	,266	,055
1c	,335	,335	,307	,162	,126	,092	,048	,190	,020	,044	,267	,315	,216	,193	,180	,281	,113
1d	,315	,315	,231	,124	,128	,145	,096	,200	,004	,018	,206	,295	,202	,111	,190	,258	,060
1e	,270	,270	,215	,110	,156	,144	,092	,186	,080	,075	,202	,276	,212	,109	,133	,192	,083
1f	,237	,237	,220	,174	,152	,173	,117	,216	,073	,055	,243	,296	,225	,088	,136	,197	,067
2a	,355	,355	,277	,231	,143	,128	,099	,167	,048	,082	,262	,252	,214	,170	,175	,315	,088
2b	,425	,425	,325	,316	,165	,180	,099	,199	,160	,153	,180	,266	,288	,214	,262	,278	,160
2c	,261	,261	,276	,183	,115	,088	,072	,142	,021	,001	,368	,248	,168	,133	,099	,173	,041
2d	,171	,171	,165	,124	,149	,146	,079	,175	,011	-,005	,259	,163	,104	,068	,007	,148	,015
2e	,111	,111	,083	,066	,160	,173	,118	,109	,064	,110	,059	,101	,087	,087	,071	,180	,128
2f	,140	,140	,129	,122	,167	,144	,078	,123	,017	,115	,121	,157	,110	,073	,093	,156	,109
3	,378	,378	,403	,296	,099	,112	,074	,096	-,026	-,063	,327	,337	,244	,278	,243	,272	,163
4a	,297	,297	,296	,281	,115	,105	,091	,160	,268	,170	,318	,201	,282	,276	,222	,217	,212
4b	,337	,337	,310	,260	,095	,095	,082	,137	,043	,069	,226	,305	,293	,254	,265	,241	,122
4c	,206	,206	,247	,164	-,015	-,002	,025	,012	,017	-,011	,391	,227	,143	,155	,127	,191	,040
4d	,345	,345	,351	,285	,124	,130	,081	,111	,030	,114	,356	,390	,262	,265	,241	,228	,136
4e	,259	,259	,292	,220	,073	,099	,077	,087	,051	,066	,476	,317	,207	,233	,191	,186	,179
4f	,310	,310	,350	,225	,183	,242	,172	,168	,148	,218	,197	,304	,317	,258	,222	,184	,142
4g	,274	,274	,241	,250	,169	,162	,077	,126	,068	,089	,273	,317	,239	,197	,143	,211	,104
4h	,245	,245	,316	,228	,056	,023	,027	,000	-,013	,007	,294	,291	,186	,373	,226	,214	,183
4i	,283	,283	,350	,243	,118	,104	,075	,042	,042	,054	,313	,270	,220	,331	,226	,173	,192
4j	,230	,230	,314	,332	,109	,104	,049	,116	,021	,022	,272	,205	,272	,404	,307	,142	,344
4k	,054	,054	,091	,099	,054	,057	,053	,037	,049	-,013	,066	,011	,084	,204	,148	,094	,180
5a	,172	,172	,156	,157	,291	,235	,241	,187	,541	,292	,073	,150	,143	,163	,088	,136	,141
5b	,215	,215	,135	,122	,242	,293	,287	,267	,080	,177	,093	,236	,168	,082	,077	,182	,052
5c	,174	,174	,144	,124	,141	,151	,139	,149	,059	,061	,275	,237	,128	,073	,063	,185	,046
5d	,200	,200	,146	,128	,365	,332	,262	,237	-,032	,098	,144	,383	,167	,127	,147	,145	,131
5e	,156	,156	,179	,181	,146	,155	,138	,174	,074	,057	,330	,302	,129	,151	,070	,139	,126
5f	,141	,141	,168	,166	,306	,238	,237	,248	,094	,122	,116	,251	,199	,223	,115	,181	,175
5g	,199	,199	,157	,234	,212	,182	,186	,254	,059	,079	,173	,229	,179	,148	,120	,236	,112
5h	,123	,123	,215	,158	,206	,145	,186	,133	-,022	-,018	,176	,246	,148	,350	,174	,200	,208
5i	,151	,151	,242	,226	,320	,193	,217	,220	,058	,049	,212	,249	,187	,308	,174	,189	,226
5j	,142	,142	,197	,221	,285	,201	,157	,287	-,008	,008	,123	,163	,271	,301	,277	,196	,280
5k	,081	,081	,147	,110	,089	,043	,076	,055	-,007	-,080	,076	,140	,100	,176	,125	,076	,166
6a	,694	,694	,515	,503	,294	,243	,169	,266	,113	,165	,229	,262	,399	,320	,386	,390	,237
6b	1	1	,586	,478	,212	,206	,132	,219	,089	,150	,283	,314	,371	,330	,391	,431	,218
6c	,586	,586	1	,462	,104	,142	,162	,143	,034	,046	,295	,286	,362	,368	,353	,330	,234
6d	,478	,478	,462	1	,161	,111	,151	,361	,065	,107	,288	,276	,455	,372	,473	,405	,315
7a	,212	,212	,104	,161	1	,688	,512	,509	,138	,192	,067	,167	,191	,095	,115	,222	,128
7b	,206	,206	,142	,111	,688	1	,585	,446	,132	,213	,025	,124	,181	,054	,106	,178	,079
7c	,132	,132	,162	,151	,512	,585	1	,455	,141	,207	,055	,172	,132	,044	,067	,124	,117
7d	,219	,219	,143	,361	,509	,446	,455	1	,100	,251	,104	,237	,300	,144	,186	,286	,136
8	,089	,089	,034	,065	,138	,132	,141	,100	1	,451	,037	,053	,094	,074	,082	,090	,136
9	,150	,150	,046	,107	,192	,213	,207	,251	,451	1	-,012	,094	,157	,044	,109	,126	,161
10	,283	,283	,295	,288	,067	,025	,055	,104	,037	-,012	1	,344	,256	,243	,213	,274	,140
11	,314	,314	,286	,276	,167	,124	,172	,237	,053	,094	,344	1	,314	,259	,211	,290	,140
12	,371	,371	,362	,455	,191	,181	,132	,300	,094	,157	,256	,314	1	,487	,501	,354	,326
13	,330	,330	,368	,372	,095	,054	,044	,144	,074	,044	,243	,259	,487	1	,580	,379	,462
14	,391	,391	,353	,473	,115	,106	,067	,186	,082	,109	,213	,211	,501	,580	1	,424	,387
15	,431	,431	,330	,405	,222	,178	,124	,286	,090	,126	,274	,290	,354	,379	,424	1	,285
16	,218	,218	,234	,315	,128	,079	,117	,136	,136	,161	,140	,140	,326	,462	,387	,285	1

Appendix 6: Factor analysis, SPSS Output 2008

All variables included

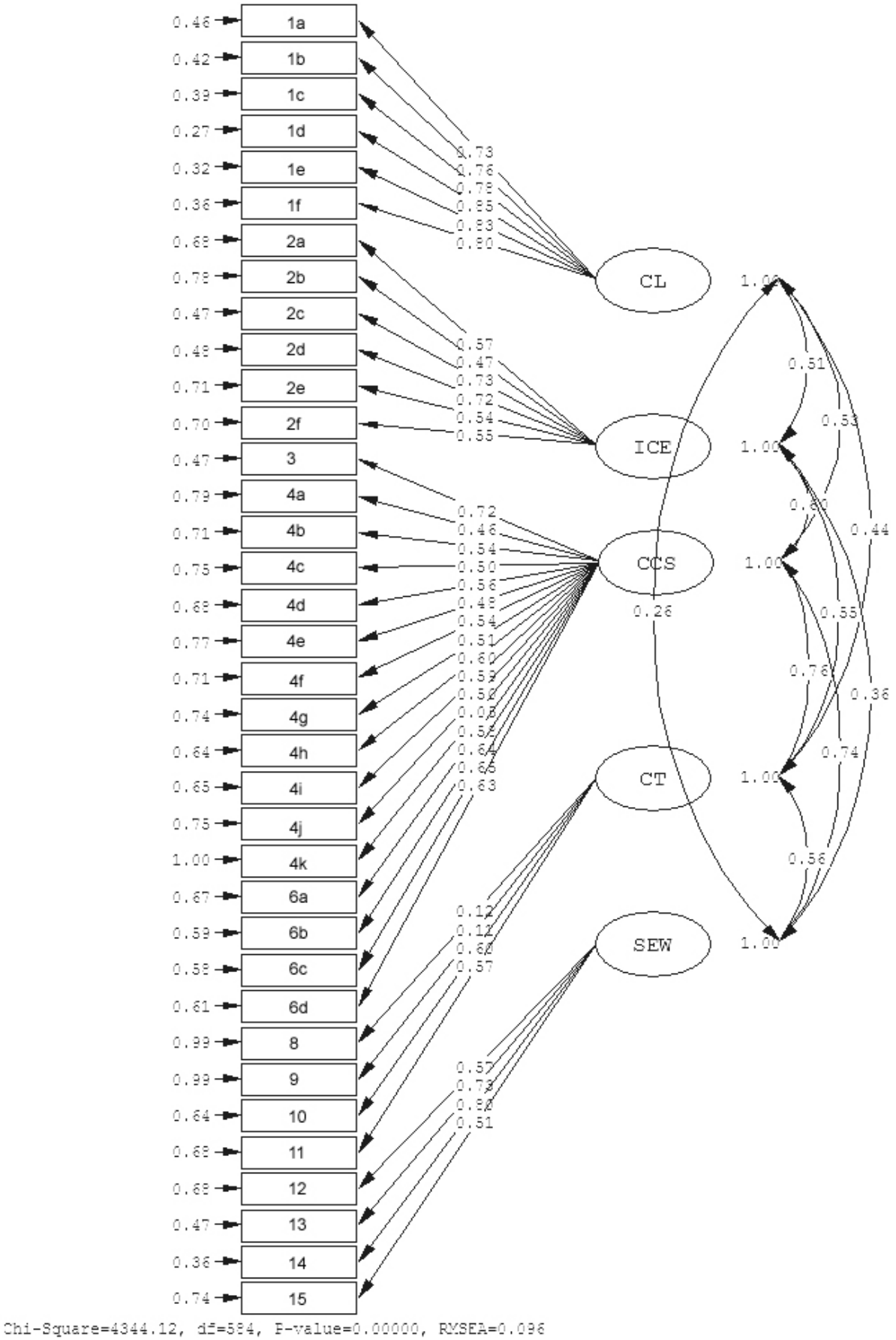
Rotated Factor Matrix													Communa-lities
	Factor												
Question	1	2	3	4	5	6	7	8	9	10	11	12	
1a	**,737**	,052	,007	,244	,056	,073	,037	,035	,005	,023	-,033	-,001	,618
1b	**,732**	,109	-,005	,193	,093	,190	,037	,038	,019	,023	,012	,009	,634
1c	**,755**	,046	,034	,148	,077	,147	,035	,073	,001	,082	,039	-,025	,639
1d	**,818**	,089	,032	,033	,012	,035	,091	,107	-,018	-,016	-,009	,066	,705
1e	**,813**	,135	,079	-,033	,030	-,005	,055	,139	-,019	-,022	-,014	,083	,718
1f	**,778**	,085	,074	,003	-,028	,042	,075	,210	,009	-,045	,010	,087	,681
2a	,340	,170	-,059	,316	,026	,208	,018	,210	,047	,024	-,050	,002	,341
2b	,137	,316	,070	,115	-,028	**,508**	,125	,185	,179	-,037	,028	-,060	,484
2c	,235	,172	-,020	**,513**	,137	,230	-,065	**,428**	-,061	,051	-,062	,117	,631
2d	,210	,045	,019	,261	,166	,172	-,077	**,557**	,030	,103	-,091	,104	,518
2e	,140	-,061	,079	,036	,080	,086	,072	**,681**	,035	,060	,151	-,036	,542
2f	,128	,046	,087	,079	,035	,003	,112	**,692**	,028	,014	,137	,101	,556
3	,359	,283	-,081	**,438**	,175	,320	,200	,072	,025	,007	,079	-,010	,593
4a	,064	,151	-,060	,357	,236	,110	,262	,042	**,416**	,098	,028	-,121	,494
4b	**,604**	,083	-,046	,238	,128	,223	,097	-,111	,071	-,020	,231	,193	,615
4c	,201	,078	-,038	**,571**	,089	,168	,042	,217	-,125	,067	,179	,235	,566
4d	,207	,121	,056	,278	,068	,213	**,568**	,018	-,002	-,102	-,024	,209	,565
4e	,148	,248	,050	**,493**	-,006	-,044	,224	,007	,097	,006	,209	-,005	,435
4f	,098	,245	,072	,002	,058	,140	**,677**	,085	,078	,052	,169	,041	,603
4g	,035	,160	,036	,237	,067	,143	,256	,151	,003	,080	**,596**	,026	,560
4h	,132	,323	-,087	,211	,356	,100	,373	,063	-,067	,149	,137	-,079	,505
4i	,116	,269	-,026	,226	**,453**	,040	**,473**	,036	,074	,148	,028	-,190	,633
4j	,070	,394	-,061	,150	,296	-,015	,337	,015	-,017	,280	,138	-,190	,522
4k	-,058	,054	-,025	-,042	,011	-,009	,008	,059	-,024	**,813**	,067	,041	,680
5a	,077	,113	,127	,188	,325	,101	,031	,050	**,691**	-,010	-,035	,072	,674
5b	,196	-,022	,189	-,044	,069	,023	-,023	-,015	,187	,013	,144	**,476**	,365
5c	,143	,033	,159	,299	,032	,003	-,043	,241	-,029	,117	,176	**,453**	,448
5d	,023	,107	,292	,070	,270	,044	,281	,151	,027	-,054	-,107	**,502**	,545
5e	,083	,185	,201	,364	-,071	-,149	,129	-,046	,063	,047	,283	,150	,369
5f	,032	,136	,243	,022	,386	,053	,242	,105	,125	-,114	,059	,283	,412
5g	-,020	,124	,152	,095	,137	,135	-,010	,148	,066	,034	**,679**	,110	,586
5h	,047	,169	,091	,037	**,688**	,044	-,007	,071	,013	,042	,091	,098	,541
5i	,100	,062	,114	,166	**,746**	-,004	,110	,094	,136	-,026	-,038	,047	,654
5j	,036	,188	,203	-,069	**,521**	,078	,022	,044	,072	,136	,099	,056	,399
5k	,063	,099	-,022	,114	,089	-,039	,027	,067	-,009	**,651**	,005	-,013	,466
6a	,204	,318	,196	-,056	,072	**,717**	,058	,101	,092	-,031	,083	,076	,739
6b	,232	,360	,058	,066	,083	**,664**	,074	,084	,055	-,030	,093	,058	,667
6c	,199	,353	,069	,112	,094	**,494**	,246	,012	,001	,017	,119	-,008	,509
6d	,172	**,498**	,071	,083	,028	**,403**	,167	,066	,068	-,044	,154	,033	,516
7a	,034	,031	**,714**	,035	,109	,067	,005	,044	,117	-,032	,047	,040	,550
7b	,075	-,031	**,768**	,029	,047	,053	,047	,050	,096	-,005	,016	,099	,626
7c	,017	-,048	**,681**	,021	,110	,020	,017	,009	,056	,019	,034	,047	,487
7d	-,010	,102	**,638**	-,019	,067	,049	-,002	,051	,041	-,034	,065	,095	,443
8	-,030	,055	,129	-,007	,032	,029	-,047	-,002	**,729**	-,017	,029	,051	,559
9	-,046	,074	,258	-,194	-,085	,088	,110	,038	**,433**	-,061	,096	,100	,350
10	,199	,181	,041	**,528**	,102	-,013	,096	,107	,057	,015	,058	-,073	,396
11	,175	,209	,152	,201	,213	,119	,231	,053	,016	-,150	-,028	,182	,310
12	,152	**,516**	,024	,069	,087	,159	,050	,015	,094	,053	,135	,089	,368
13	,036	**,663**	,048	,115	,193	,129	,052	,054	,008	,110	-,068	-,061	,537
14	,083	**,731**	-,022	,124	,084	,159	,138	-,021	,034	,020	,003	,035	,611
15	,089	**,475**	,024	,160	,026	,200	,021	,069	,070	-,088	,129	,063	,339
16	,054	**,492**	,013	,072	,155	,071	,113	-,057	,050	,106	,039	,015	,311

Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 15 iterations.

Explained variance: **53,1%**

Appendix 7: LISREL output 2008 – Path diagram, full model, questions 5, 7 and 16 excluded

Comment: All estimations are significant on a 1% level except variable 4k.



Appendix 8: Factor analysis, SPSS Output 2009

All variables included

Rotated Factor Matrix													Communalities
	Factor												
Question	1	2	3	4	5	6	7	8	9	10	11	12	
1a	**,728**	,064	,074	,094	,056	,063	,140	,050	,019	,103	,053	-,018	,592
1b	**,742**	,018	,091	,128	,082	,051	,130	,066	-,016	,069	,026	,041	,614
1c	**,701**	,027	,126	,113	,112	,113	,127	-,001	,004	,025	,056	,059	,569
1d	**,831**	,084	,049	,100	,061	,016	,032	-,028	-,014	,055	,065	,027	,724
1e	**,751**	,066	-,001	,096	,104	,087	-,036	,021	,072	,085	,042	,075	,618
1f	**,704**	,071	,027	,106	,083	-,019	,069	-,043	-,011	,110	,052	,142	,562
2a	,294	,093	,055	,341	,012	,080	,280	-,079	,060	,213	,045	,058	,360
2b	,177	,103	,088	**,541**	,109	,016	,173	,082	,189	,150	-,004	,024	,451
2c	,311	,051	-,001	,179	,134	,042	**,602**	,085	,031	,206	,039	,081	,572
2d	,354	,112	-,080	,182	-,045	,143	**,422**	,040	,012	,305	-,061	,037	,478
2e	,162	,103	,085	,009	,014	,047	,099	,058	,055	**,671**	,105	-,048	,527
2f	,158	,080	,077	,119	,036	,009	,092	,102	,021	**,626**	,056	,086	,475
3	,375	-,029	,127	,250	,239	,175	,351	,134	-,004	,041	-,016	,151	,474
4a	,053	,003	,208	,220	,388	,099	,256	,153	,351	-,014	-,033	,108	,479
4b	**,584**	,019	,218	,046	,340	-,049	,152	,002	,058	-,033	,254	-,050	,604
4c	,196	-,103	,075	,022	,311	,030	**,651**	,007	,007	,040	,394	-,018	,733
4d	,262	,062	,168	,108	**,656**	,026	,101	-,027	,004	,062	,150	,113	,594
4e	,157	,028	,155	,058	**,497**	,043	,270	,016	,023	,012	-,012	**,507**	,632
4f	,216	,156	,105	,153	**,608**	,096	-,008	,130	,152	,056	,045	-,027	,531
4g	,107	,090	,036	,231	,365	,064	,178	,241	,084	,036	,249	,228	,424
4h	,110	-,136	,144	,063	**,412**	**,486**	,172	,196	,016	,012	-,032	,115	,544
4i	,121	-,036	,147	,188	**,466**	,343	,207	,315	,034	-,079	-,178	,089	,596
4j	,036	,050	,279	,092	**,417**	,158	,199	**,575**	,014	-,088	-,104	,046	,680
4k	-,035	-,005	,150	,015	,067	,102	-,006	**,589**	-,023	,144	,019	,015	,408
5a	,043	,204	,025	,123	-,020	,318	,055	,077	**,652**	-,028	,055	,081	,605
5b	,258	,274	,054	,097	,073	,017	-,045	,024	,103	,078	**,407**	-,010	,344
5c	,148	,099	-,004	,079	,076	,059	,221	,059	-,001	,181	**,494**	,187	,411
5d	,128	,356	,041	,061	,269	,319	-,179	-,018	-,052	,243	,255	,122	,496
5e	,129	,142	,081	,021	,093	,101	-,001	,088	,108	,050	,200	**,658**	,558
5f	,086	,300	,084	,085	,129	**,461**	-,088	,117	,155	,133	,182	,059	,441
5g	,046	,237	,028	,180	-,040	,101	,070	,235	,107	-,001	**,410**	,233	,397
5h	,059	,098	,148	-,017	,037	**,783**	,066	,130	,006	,058	,047	,063	,680
5i	,070	,211	,128	,105	,062	**,682**	,106	,185	,113	-,035	-,015	,012	,607
5j	,066	,232	,235	,019	,029	,395	,049	**,406**	,043	-,016	,070	,059	,449
5k	,018	,012	,085	,012	,022	,268	-,025	**,482**	-,057	,067	,196	,019	,360
6a	,174	,163	,276	**,742**	,116	,034	,013	-,004	,108	,054	,118	-,055	,731
6b	,260	,114	,274	**,695**	,168	,031	,030	-,007	,047	,027	,114	,052	,687
6c	,198	,059	,326	**,492**	,214	,140	,121	,051	-,013	-,038	,069	,091	,488
6d	,050	,153	**,435**	**,477**	,066	,024	,097	,131	,037	-,009	,033	,124	,492
7a	,066	**,769**	,060	,131	,029	,182	,025	,024	,102	,110	,018	,000	,675
7b	,068	**,787**	,014	,098	,115	,052	,001	,020	,051	,095	-,002	,007	,661
7c	,034	**,663**	,063	,027	,049	,075	,032	-,009	,082	,012	,117	,064	,479
7d	,086	**,634**	,201	,132	-,079	,053	,011	,063	,104	,000	,112	,086	,511
8	,005	,052	,059	,043	,036	,004	,020	-,032	**,769**	,009	,007	,037	,603
9	-,003	,201	,124	,096	,171	-,070	-,084	-,125	**,461**	,146	,089	-,021	,364
10	,150	-,016	,233	,178	,221	,148	,369	-,050	-,051	-,015	,045	,374	,463
11	,241	,135	,141	,191	,284	,222	,006	-,026	,018	,043	,234	,239	,378
12	,148	,171	**,526**	,258	,184	,027	,019	,047	,108	,021	,049	,031	,446
13	,092	,002	**,680**	,103	,156	,249	,044	,147	,055	,026	-,017	,057	,599
14	,151	,069	**,677**	,252	,114	,054	,034	,102	-,006	,043	-,011	-,016	,578
15	,174	,140	**,418**	,307	-,026	,128	,083	,000	,029	,113	,144	,090	,385
16	-,029	,065	**,580**	,068	,068	,108	-,039	,177	,099	,088	,013	,076	,418

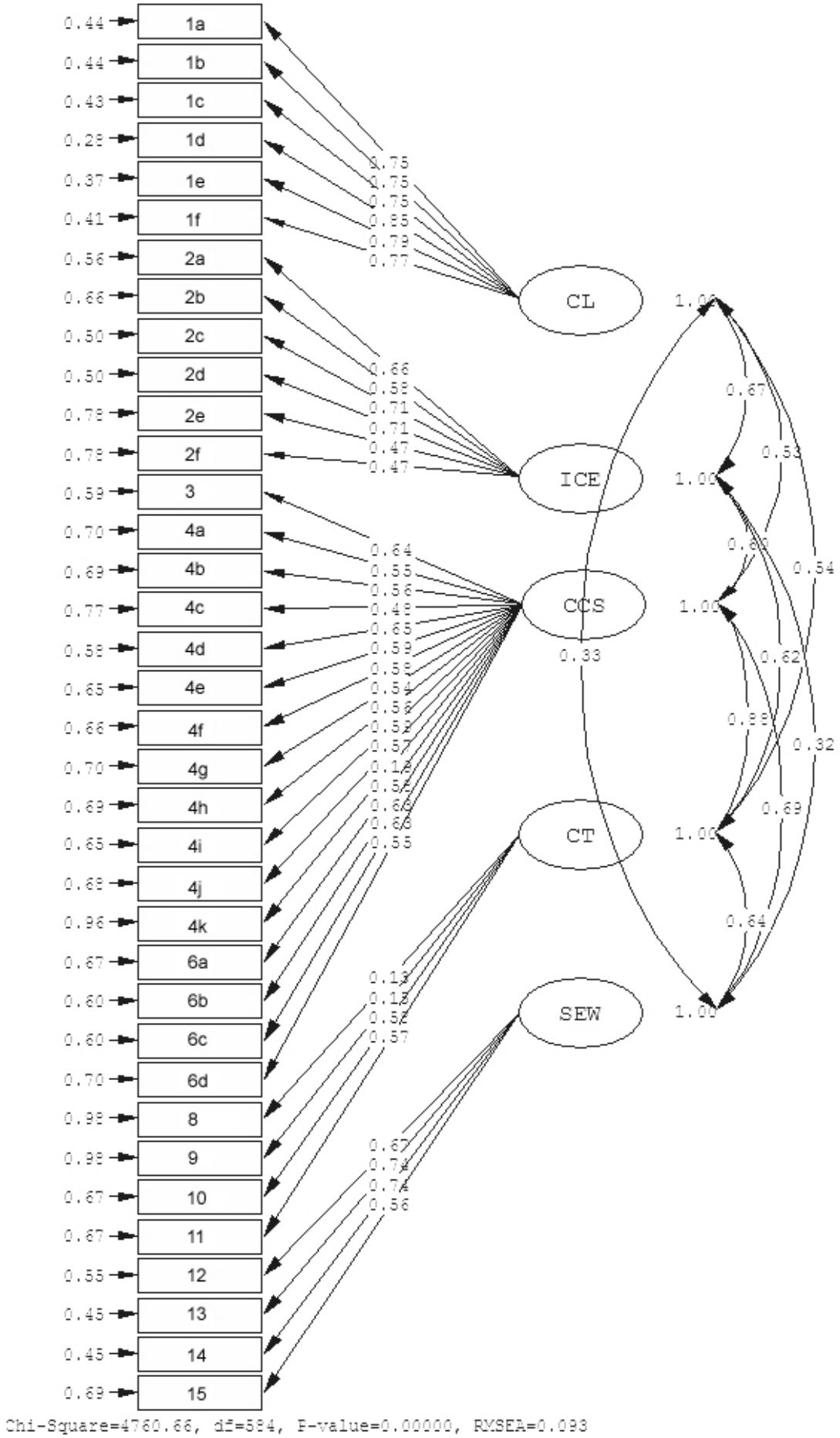
Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 17 iterations.

Explained variance: **53,0%**

Appendix 9: LISREL output 2009 – Path diagram, full model, questions 5, 7 and 16 excluded

Comment: All estimations are significant on a 1% level.



Chi-Square=4760.66, df=584, P-value=0.00000, RMSEA=0.093

Appendix 10: Factor Analysis, Oblimin rotation, Maximum Likelihood. Variables 3,5,7 omitted.

Pattern Matrix 2008

	Factor								
	1	2	3	4	5	6	7	8	9
1a	**,733**	-,135	,024	,012	-,051	-,006	-,010	-,024	,050
1b	**,696**	-,148	,043	,015	-,024	-,044	-,019	-,057	-,095
1c	**,627**	-,228	,131	-,020	,059	-,031	-,054	-,013	-,022
1d	,384	**-,552**	,038	,013	,023	-,020	-,038	-,040	,016
1e	,082	**-,879**	-,044	,059	-,081	-,026	-,008	-,067	,042
1f	,152	**-,723**	,071	-,021	-,050	,019	,024	,012	-,004
2a	,244	-,043	,040	,037	-,339	-,046	,046	,045	-,142
2b	,042	,016	,033	,110	-,206	-,055	,176	-,110	-,572
2c	-,024	-,106	,097	,022	**-,646**	-,045	-,128	,252	-,151
2d	-,021	-,130	,284	,049	**-,553**	,064	,010	,010	-,119
2e	,167	,088	**,844**	-,005	-,023	,076	,038	-,070	-,036
2f	-,074	-,120	**,695**	-,047	-,062	-,042	,043	,112	,062
3	,272	-,018	-,042	,158	-,167	-,129	-,054	,296	-,211
4a	,162	,130	-,037	,363	-,135	,003	,318	,179	-,030
4b	**,511**	-,118	-,007	-,031	,103	-,036	-,020	,254	-,120
4c	,041	-,024	,099	-,062	-,272	-,023	-,177	**,611**	-,040
4d	,074	-,083	-,002	,201	,092	,044	-,007	,387	-,213
4e	,096	-,013	,009	,106	-,029	-,151	,114	**,457**	,126
4f	-,091	-,148	,083	**,468**	,225	,023	,087	,169	-,218
4g	-,023	,051	,244	,121	,148	-,063	-,020	,437	-,111
4h	,071	-,017	,010	**,552**	,017	-,112	-,095	,153	-,070
4i	,097	-,012	-,046	**,781**	-,053	,020	,059	,028	-,051
4j	-,036	-,076	-,042	**,632**	-,025	-,183	-,041	,007	,024
4k	-,045	,044	,090	,212	-,036	-,077	-,075	-,080	,071
6a	,026	-,048	,023	-,032	-,060	-,095	,043	-,109	**-,792**
6b	,042	-,045	,004	-,054	-,056	-,168	-,025	,058	**-,672**
6c	,132	,039	,036	,124	,097	-,180	-,078	,077	**-,519**
6f	-,008	-,066	,016	-,009	,029	-,328	,057	,122	**-,414**
8	,031	,054	-,006	-,027	-,068	-,044	**,671**	-,036	,045
9	-,135	-,093	,094	-,038	,150	-,014	**,531**	-,023	-,093
10	,115	-,034	,007	,079	-,215	-,122	,099	,399	,151
11	,037	-,109	-,004	,068	-,029	-,125	,058	,211	-,090
12	-,008	-,095	,001	-,019	,024	**-,489**	,060	,066	-,078
13	-,010	,020	,025	,083	-,089	**-,718**	-,024	-,126	-,016
14	,026	,009	-,031	,012	,056	**-,785**	-,010	,017	-,037
15	,025	,016	,020	-,105	-,048	**-,429**	,040	,115	-,150
16	,032	,009	-,028	,120	,055	**-,491**	,026	,002	-,001

Structure Matrix 2008

	Factor								
	1	2	3	4	5	6	7	8	9
1a	,809	-,550	,119	,138	-,269	-,181	,006	,245	-,191
1b	,811	-,586	,158	,170	-,248	-,267	,031	,259	-,338
1c	,758	-,622	,222	,128	-,172	-,208	-,014	,260	-,276
1d	,689	-,771	,183	,099	-,140	-,180	-,008	,207	-,248
1e	,593	-,903	,173	,091	-,167	-,181	,012	,160	-,236
1f	,590	-,832	,254	,049	-,168	-,147	,053	,224	-,271
2a	,439	-,284	,202	,182	-,444	-,270	,088	,261	-,300
2b	,250	-,198	,203	,241	-,256	-,399	,297	,177	-,647
2c	,360	-,270	,358	,222	-,729	-,314	-,080	,425	-,305
2d	,263	-,258	,474	,152	-,631	-,154	,021	,187	-,222
2e	,165	-,183	,830	,135	-,249	-,044	,043	,105	-,169
2f	,097	-,249	,734	,130	-,236	-,122	,052	,226	-,144
3	,535	-,330	,163	,399	-,324	-,474	,049	,553	-,456
4a	,261	-,039	,092	,465	-,209	-,308	,355	,371	-,224
4b	,668	-,496	,102	,166	-,093	-,273	,062	,467	-,369
4c	,339	-,227	,277	,191	-,399	-,252	-,110	,665	-,238
4d	,305	-,262	,141	,345	-,012	-,284	,093	,528	-,381
4e	,285	-,164	,121	,323	-,144	-,330	,159	,551	-,159
4f	,132	-,212	,212	,537	,143	-,336	,182	,367	-,380
4g	,135	-,116	,321	,332	,010	-,296	,069	,530	-,305
4h	,263	-,148	,173	,673	-,105	-,456	-,022	,398	-,267
4i	,269	-,114	,141	,805	-,145	-,411	,106	,320	-,223
4j	,156	-,096	,116	,705	-,101	-,468	,004	,250	-,168
4k	-,047	,067	,106	,219	-,062	-,108	-,084	-	,046
6a	,270	-,299	,188	,134	-,119	-,441	,219	,186	-,836
6b	,314	-,309	,178	,173	-,142	-,493	,149	,326	-,780
6c	,312	-,238	,170	,337	-,030	-,504	,079	,350	-,655
6f	,252	-,264	,159	,258	-,069	-,565	,203	,364	-,632
8	,023	,023	-	,012	-,044	-,086	,657	,032	-,105
9	-,082	-,064	,080	-	,175	-,064	,554	,023	-,204
10	,331	-,186	,148	,282	-,320	-,294	,123	,502	-,117
11	,244	-,228	,112	,223	-,106	-,301	,121	,343	-,279
12	,194	-,205	,094	,246	-,070	-,553	,144	,258	-,357
13	,147	-,084	,120	,391	-,198	-,734	,050	,137	-,319
14	,200	-,135	,056	,382	-,074	-,803	,094	,271	-,398
15	,192	-,142	,108	,171	-,140	-,503	,130	,282	-,382
16	,145	-,084	,038	,345	-,035	-,545	,091	,193	-,251

Comment:

Most researchers study the pattern matrix (Field 2005). The results for the Oblimin (oblique) rotation points towards the results we had in the Varimax rotation, although there are some differences, especially in the Leadership area which is now divided into two separate factors. One has to keep in mind that variables 5 and 7 have been omitted, not making these results directly comparable with the results from Appendices 6 and 8.

Pattern Matrix 2009

	Factor							
	1	2	3	4	5	6	7	8
1a	**,810**	-,068	,040	,001	,060	,094	-,033	-,106
1b	**,640**	-,210	,076	-,020	-,016	,046	-,049	-,063
1c	,376	-,393	,012	-,046	-,069	,028	-,051	,058
1d	,310	**-,632**	-,057	,002	-,065	,030	-,036	-,053
1e	,049	**-,836**	,049	,022	-,004	,028	,013	-,087
1f	,027	**-,736**	-,089	-,014	-,064	,113	,008	,073
2a	,081	-,093	-,041	,039	-,009	,356	-,317	,072
2b	-,073	-,107	,130	,077	,089	,228	**-,553**	-,056
2c	,164	,032	,109	,152	-,119	**,493**	-,140	,338
2d	,092	-,140	,111	,165	-,113	**,550**	-,142	,043
2e	,001	-,109	-,046	-,128	,171	**,528**	,107	-,001
2f	,050	-,048	-,003	-,097	,144	**,467**	,001	,021
3	,222	-,075	,200	,014	-,164	,136	-,198	,279
4a	-,079	-,013	,276	-,037	,203	,047	-,154	,313
4b	**,486**	-,156	-,049	-,111	,108	-,105	,024	,290
4c	,171	,102	,002	,038	-,064	,228	,017	**,583**
4d	,145	-,106	,036	-,066	,233	-,147	,003	**,548**
4e	,004	-,077	,112	-,059	,032	-,008	,033	**,606**
4f	,054	-,178	,277	,030	,327	-,142	-,069	,254
4g	-,047	-,071	,150	-,006	,118	,003	-,116	**,405**
4h	,070	-,008	**,481**	-,043	-,035	-,041	,020	,271
4i	,042	-,064	**,677**	,061	,004	-,077	-,120	,137
4j	,034	,030	**,714**	-,105	,006	-,052	-,032	,087
4k	-,009	,040	**,480**	-,138	-,012	,095	,051	-,153
6a	,039	-,012	-,047	-,105	,118	-,044	**-,789**	-,067
6b	,131	-,022	-,029	-,093	,067	-,088	**-,753**	-,002
6c	,073	-,033	,083	-,162	-,069	-,082	**-,519**	,115
6f	-,032	,043	,029	-,314	,002	,004	**-,462**	,068
8	-,036	,000	,026	,011	**,469**	,070	-,040	-,010
9	,090	,088	-,075	-,011	**,716**	,066	-,048	-,006
10	-,054	-,056	,014	-,151	-,166	,126	-,086	**,492**
11	-,012	-,231	,004	-,109	,081	-,036	-,104	,309
12	-,018	-,100	-,002	**-,487**	,099	-,020	-,178	,073
13	,080	,036	,186	**-,684**	-,052	-,005	,018	,062
14	,082	-,018	,030	**-,664**	-,059	-,019	-,155	-,002
15	,083	-,002	-,115	**-,400**	-,018	,110	-,250	,072
16	-,069	-,005	,144	**-,560**	,070	,046	,023	-,026

Structure Matrix 2009

	Factor							
	1	2	3	4	5	6	7	8
1a	,852	-,570	,117	-,134	,072	,312	-,295	,230
1b	,781	-,614	,167	-,163	,028	,271	-,318	,270
1c	,660	-,660	,146	-,174	,012	,246	-,332	,335
1d	,683	-,805	,040	-,101	,020	,266	-,305	,237
1e	,527	-,843	,119	-,097	,104	,251	-,264	,203
1f	,511	-,785	,041	-,098	,046	,314	-,279	,289
2a	,333	-,357	,101	-,134	,082	,479	-,457	,274
2b	,195	-,315	,249	-,215	,214	,374	-,617	,234
2c	,412	-,328	,267	-,033	-,050	,601	-,360	,504
2d	,359	-,380	,176	,018	-,048	,644	-,301	,248
2e	,177	-,250	,054	-,153	,222	,547	-,127	,098
2f	,213	-,243	,108	-,171	,202	,510	-,212	,154
3	,471	-,400	,375	-,204	-,063	,307	-,434	,524
4a	,122	-,197	,457	-,288	,302	,157	-,378	,485
4b	,652	-,527	,160	-,243	,164	,104	-,308	,490
4c	,350	-,225	,223	-,083	-,015	,319	-,241	,621
4d	,364	-,370	,296	-,257	,310	,021	-,322	,657
4e	,258	-,282	,361	-,222	,120	,112	-,272	,674
4f	,254	-,352	,423	-,229	,402	,021	-,319	,462
4g	,181	-,246	,344	-,212	,207	,121	-,336	,524
4h	,204	-,178	,592	-,250	,042	,062	-,216	,466
4i	,206	-,231	,741	-,250	,098	,064	-,320	,443
4j	,130	-,120	,783	-,370	,103	,047	-,260	,379
4k	-,007	,007	,460	-,242	,037	,103	-,062	,030
6a	,252	-,299	,158	-,419	,272	,155	-,823	,251
6b	,351	-,353	,189	-,413	,218	,135	-,820	,329
6c	,292	-,293	,297	-,416	,077	,098	-,646	,386
6f	,144	-,167	,256	-,513	,153	,127	-,596	,289
8	-,011	-,075	,076	-,104	,480	,102	-,131	,058
9	,057	-,090	,012	-,148	,711	,116	-,177	,072
10	,221	-,242	,265	-,266	-,052	,221	-,335	,562
11	,264	-,374	,211	-,259	,184	,106	-,345	,443
12	,175	-,250	,246	-,602	,247	,093	-,442	,269
13	,180	-,138	,431	-,746	,098	,069	-,323	,272
14	,221	-,205	,289	-,736	,103	,084	-,442	,224
15	,247	-,229	,121	-,491	,111	,214	-,458	,245
16	,016	-,067	,320	-,602	,190	,075	-,230	,125

Appendix 11: Simplis code for LISREL

```
FULL08
Observed variables
1a 1b 1c 1d 1e 1f 2a 2b 2c 2d 2e 2f 3 4a 4b 4c 4d 4e 4f 4g 4h 4i 4j
4k 6a 6b 6c 6d 8 9 10 11 12 13 14 15 16
Correlation matrix
 [Data matrix]
Sample size 698
Latent variables: CL ICE CCS CT SEW
Relationships:
1a 1b 1c 1d 1e 1f = CL
2a 2b 2c 2d 2e 2f = ICE
3 4a 4b 4c 4d 4e 4f 4g 4h 4i 4j 4k 6a 6b 6c 6d = CCS
8 9 10 11 = CT
12 13 14 15 = SEW
Number of decimals=2
Wide print
Print Residuals
Path diagram
End of problem



RED08
Observed variables
1a 1b 1c 1d 1e 1f 2a 2b 2c 2d 2e 2f 3 4a 4b 4c 4d 4e 4f 4g 4h 4i 4j
4k 6a 6b 6c 6d 8 9 10 11 12 13 14 15 16
Correlation matrix
 [Data matrix]
Sample size 698
Latent variables: LEAD IC CC VSP EI
Relationships:
1a 1b 1c 1d 1e 1f = LEAD
2c 2d 2e 2f = IC
4a 4d 4f 4h 4i = CC
6a 6b 6c = VSP
12 13 14 15 = EI
Number of decimals=2
Wide print
Print Residuals
Path diagram
End of problem



FULL09
Observed variables
1a 1b 1c 1d 1e 1f 2a 2b 2c 2d 2e 2f 3 4a 4b 4c 4d 4e 4f 4g 4h 4i 4j
4k 6a 6b 6c 6d 8 9 10 11 12 13 14 15 16
Correlation matrix
 [Data matrix]
Sample size 826
Latent variables: CL ICE CCS CT SEW
Relationships:
1a 1b 1c 1d 1e 1f = CL
2a 2b 2c 2d 2e 2f = ICE
3 4a 4b 4c 4d 4e 4f 4g 4h 4i 4j 4k 6a 6b 6c 6d = CCS
8 9 10 11 = CT
12 13 14 15 = SEW
Number of decimals=2
Wide print
Print Residuals
Path diagram
End of problem
```

```
RED09
Observed variables
1a 1b 1c 1d 1e 1f 2a 2b 2c 2d 2e 2f 3 4a 4b 4c 4d 4e 4f 4g 4h 4i 4j
4k 6a 6b 6c 6d 8 9 10 11 12 13 14 15 16
Correlation matrix
[Data matrix]
Sample size 826
Latent variables: LEAD IC CC VSP INTRA EI
Relationships:
1a 1b 1c 1d 1e 1f = LEAD
2e 2f = IC
4a 4d 4e 4f 4g 4h 4i = CC
6a 6b 6c = VSP
8 9 = INTRA
12 13 14 15 = EI
Number of decimals=2
Wide print
Print Residuals
Path diagram
End of problem
```

Appendix 12: Correlation matrices between factors from LISREL

2008

Correlation Matrix of Independent Variables

	LEAD	IC	CC	VSP	EI
LEAD	1.00				
IC	0.45	1.00			
	(0.04)				
	11.82				
CC	0.34	0.34	1.00		
	(0.04)	(0.04)			
	8.57	7.56			
VSP	0.44	0.41	0.50	1.00	
	(0.04)	(0.04)	(0.04)		
	11.98	10.00	13.32		
EI	0.25	0.26	0.63	0.63	1.00
	(0.04)	(0.05)	(0.03)	(0.03)	
	6.06	5.69	18.56	19.19	

2009

	LEAD	IC	CC	VSP	INTRA	EI
LEAD	1.00					
IC	0.39	1.00				
	(0.04)					
	10.12					
CC	0.44	0.23	1.00			
	(0.03)	(0.04)				
	13.12	5.28				
VSP	0.44	0.21	0.56	1.00		
	(0.03)	(0.04)	(0.03)			
	13.04	4.96	18.05			
INTRA	0.07	0.17	0.20	0.20	1.00	
	(0.04)	(0.05)	(0.05)	(0.05)		
	1.66	3.41	4.32	4.29		
EI	0.34	0.19	0.54	0.66	0.18	1.00
	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)	
	9.07	4.21	16.15	23.38	3.88	

The numbers are (in order)
-Correlation coeeficient
-Standard error within brackets.
-t-value