Benefiting from Commissioned Research: The Role of Researcher – Client Cooperation

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Abstract

This paper discusses why commissioned research often is neglected and misunderstood, as well as how its use can be enhanced. We argue that the lack of use of such research can be attributed to differences in researchers' and practitioners' knowledge and expectations regarding research problems, solutions, interpretations, and applications. Two hypotheses are proposed, which link the use of research to cooperation between researchers and users during the production of the research, and to qualified assistance in interpreting and applying the research results. The hypotheses were tested on a sample of 65 buyers of 86 research projects in the seafood industry. The reported findings reveal that collaboration foster research utilisation, but also that close cooperation between the providers and the users of research may substitute qualified assistance in enhancing research utilisation.

Key Words: Research, utilisation, and cooperation

Introduction

Firms embedded in everchanging and hostile environments need continuously to acquire and utilise timely and relevant information to discover and take advantage of opportunities, and to avoid threats that may arise. Firms may learn about their surrounding environment in a variety of ways. For example, through interactions with customers and other constituencies, firms may come across relevant information. Organisations and their management can also observe and reflect over the outcomes of their own decisions and activities, and thus they can learn by "trial and error", even though such learning can be imperfect (Levinthal & March 1993). They may also learn from the observation of competitors, as dealt with in the extensive literature on imitation and mimetic processes (see e.g., Galaskiewicz & Wasserman 1989; Haveman 1993).

The importance of firms' ability to learn has been emphasised in the research literature. For example, the literature on market orientation primarily reflects that by focusing on customers and other important constituencies, firms may acquire information which makes it possible to survive and prosper (see e.g., Kohli & Jaworski 1990; Slater & Narver 1995).

In addition to getting insights through interactions, observations, imitations and trial and errors, organisations may also gain insights in a more systematic fashion by conducting research. Research is often carried out in order to answer and shed light on specific problems. The research is commonly organised and conducted as projects, i.e. specific tasks to be solved within a given time and resource frame. Firms often outsource their research tasks due to limited time and resources or the lack of research competence.

Commissioned research is costly, but may produce timely, relevant and highly reliable information. Thus, buyers of commissioned research should be highly motivated to utilise the acquired information. It is however a common observation that commissioned research frequently is neglected, misused or not understood at all (see e.g., Caplan et al. 1975; Deshpandé & Zaltman 1983; Grønhaug & Haukedal 1997; Knorr 1977).

The purpose of the present study is to enhance our insights regarding the use of commissioned research. In so doing, we draw on insights from cognitive psychology to argue that researchers and users often differ in their knowledge of and expectations to research, which may lead to the production of less useful research and/or impair its utilisation. Furthermore, we argue that collaboration between researchers and users during the production of research will enhance both researchers' and users' understanding of the research context and of central concepts involved, as well as calibrating expectations about the outcome of the research. This serves to reduce the "gap" in understanding and expectations between researchers and users, and is thus expected to lead to the production of more useful research, and to enhanced utilisation of the research. We also suggest that if the research providers' assist in interpreting and applying the research findings, this will enhance its use.

The topic of research use has been investigated before. For example, several studies of research utilisation and knowledge transfer in public policy making processes have shown that information generated through research has had little influence on decisions and seems to be underutilised (Deshpandé & Zaltman 1983). Within marketing, a range of studies has investigated marketing managers' use of research (e.g., Deshpandé & Zaltman 1982; Deshpandé & Zaltman 1984; Lee et al. 1987). An interesting finding in some of the earlier studies was that marketing managers reported that much of the research they received was not applicable or sufficiently convincing to be used in critical decisions (Lee et al. 1987). Other

studies within marketing have focused on factors that might influence the use of marketing research. For example, Deshpandé and Zaltman (1982) in a study of brand managers, found that the more decentralised the organisation was, the greater the tendency was to use market research in decision making. Other studies have identified trust between providers and users of market research as an important factor affecting the use of research (Moorman et al. 1992; Zaltman & Moorman 1988). It should also be noted that action researchers, which work closely with organisations which go through some planned change, have long advocated collaboration between researchers and users to enhance research utilisation (e.g., Eden & Huxham 1996; Elden & Chisholm 1993). However, there has been little systematic examination of the effect of collaboration and assistance when the researcher is not playing an action-oriented interventionist role (Mohrman et al. 2001).

The remainder of the paper is organised as follows: In the next section, we explain the theoretical rationale underlying our hypotheses. We then describe our research, a survey-based study of the buyers of commissioned research from a national research institute which serves a wide range of actors in the seafood industry. Then we report our findings, draw conclusions, and highlight their implications.

From Research Data to Knowledge Use

Why is it apparently so difficult to make use of commissioned research? There are probably many answers to this intricate question. Our approach begins with the important distinction between data and information (or knowledge) proposed by Daft and Macintosh (1981). According to these scholars, information is data that changes how one understands the external world, i.e.: "To qualify as information, the data must effect a change in the individual's understanding of reality" (p.210). This implies that for data (e.g. a research report) to become information it must be interpreted and understood, and it must be new to the user. How then do people interpret data? The answer to this question is closely related to how individuals, often subconsciously, develop and apply mental models, i.e. mentally constructed "road maps" of what works and how to act (cf. Johnson-Laird 1983). Mental models consist of interrelated categories or concepts that help managers, and others, to organise and process information effectively. This is so because mental models give focus, direct people's attention and thus contribute to what and how they perceive the external world. This relates to cognitive processes involved in categorisation, i.e. basic cognitive

activities related to conceptualisation and understanding (Rosch 1978). Categorisation influences the noticing and interpretation of data as well as what data are noted and how it is structured. An important point is that actors' categories mainly develop through interactions with their environment (Rosch et al. 1976). This means that, over time, mental models and the inherent concepts become more or less suited to the context in which the actor is embedded and operate (Day & Nedungadi 1994; Rosch 1978). Because researchers and practitioners operate in partly different environments, their mental models and inherent concepts are likely to differ, which implies that they may interpret and understand "reality" differently. For example, researchers' understanding of concepts may only partly overlap with how practitioners understand the same concept. Consider for instance the concept of "market orientation". Whereas researchers probably adopt their understanding of that concept from the research literature (e.g. the definition of market orientation provided by Kohli & Jaworski 1990), research findings indicate that practitioners develop their personal understanding of this concept to fit the realities of their competitive context (Ottesen & Grønhaug 2001). This indicates that practitioners' understanding of "market orientation" is likely to deviate from that of the researcher. Thus, if the researcher makes recommendations, without explicating them in detail, e.g. "to increase profitability – become more market-oriented", then the practitioner may implement such advice in a different manner than intended, or s/he may neglect the advice because it is not understood. This indicates that careful coding of research data might be necessary to make it available to users. However, to carry out such coding the researcher must have a very good understanding of the user and his or her context and research requirements.

Differences in thinking and understanding between researchers and practitioners give rise to other types of misunderstandings as well. For example, they may perceive research problems and solutions differently (Andreasen 1985). They may also differ in their understanding of what constitutes new (or useful) knowledge. Whereas a researcher might value basic or conceptual research that display theoretical and methodological rigor, a practitioner might value applicable or instrumental knowledge as more useful. Such differences in understanding and expectations between researchers and practitioners may prevent researchers from understanding and appreciating what constitutes useful commissioned research. This in turn, may lead to the production of trivial or irrelevant research, which will not be considered new (useful) by the user and will thus not be applied.

Researchers and practitioners are experts in their domains. To become true experts individuals must go through extensive training and learning. This often lasts more than 10

years (Simon 1991). Because researchers and practitioners operate in partly different environments, with partly different demands (e.g. in terms of required skills and knowledge), they are likely to differ in terms of their area of knowledge (expertise). An important area in which they are likely to differ is in their ability to conduct, evaluate and understand research (Lee et al. 1987). Whereas such skills are at the heart of researchers' expertise, practitioners can not be expected to have the same skills and knowledge. This is easy to understand because practitioners need to spend their limited time and capacity on a variety of other tasks, and they lack the necessary education and training. Thus, practitioners may find it difficult to comprehend research findings presented to them. On the other hand, researchers might not have sufficient knowledge about the users, i.e. about their context and expectations to the research, and how they will utilise the research.

Another relevant point related to differences in knowledge between researchers and practitioners is that buyers of commissioned research may lack the ability to formulate precise and manageable research questions and thus to request timely and relevant research. One reason for this is a lack of training and education, as noted above. Another reason is that research results can be characterised as "experience goods", which means that the outcome is experienced *after* the research has been conducted (cf. Nelson 1970). It should also be noted that the firm's knowledge of and expectations to how it may benefit from the research might be unclear. For example, at the outset, firms may hold naive and unrealistic expectations regarding the outcome of the research, which may result in dissatisfaction with the research supplier and the outcome of the research.

The above discussion indicates that a difference in knowledge and expectations between researchers and practitioners may lead to the production of less useful research and/or impair the utilisation of research. We therefore suggest that reducing the "gap" in knowledge and expectations between researchers and users may lead to the production of more relevant research, which can be understood and used by practitioners. More specifically, researchers and practitioners may benefit from developing a shared understanding of the research context, the research problems/tasks, the meaning of central concepts involved, as well as their expectations to the research (Andreasen 1985; Deshpandé & Zaltman 1984; Grønhaug & Haukedal 1997). How can this be accomplished, if at all? Insights from the literature on teams and group decision-making show that when people interact socially with each other, their views and insights become more similar (see e.g., Bettenhausen & Murnighan 1985; Chattopadhyay et al. 1999; Geletkanycz & Hambrick 1997). This build on the observation that social interaction leads to conformity in perspectives. It is thus expected

that communication and interaction about a particular research task may help clarify the many issues discussed above, which may lead to the production of useful research that is likely to be utilised by the buyer of commissioned research.

Commissioned research implies conducting a specific research task. The work often results in a research report. To become useful, i.e. to serve as valuable input for further actions, the report must be read and understood. However, the buyers of research often have a rather limited ability to read, understand, and make use of research reports. In such cases, qualified assistance in interpreting and making use of the reported research may be useful. Through explanations from and discussions with the researcher, the buyer of the research may gradually gain new insights which enables him or her to change their present thinking about an issue and thereby to benefit from the contracted research. Based on the above discussion we suggest two hypotheses, i.e.:

> Hypothesis 1: The degree of cooperation between research providers and users co-vary positively with the utilisation of commissioned research.
>
> Hypothesis 2: Qualified assistance in interpreting and applying the research results co-vary positively with its use.

Research Methodology

In this section, we describe the research setting, data collection and the measures used to test our research hypotheses.

Research Setting and Data Collection

The empirical setting chosen is the buyers of commissioned research from a national research institute operating in the Norwegian seafood industry. The research institute serves a wide range of different types of actors, which include manufacturing firms, trade organisations, and governmental bodies. It has some 80 researchers working in such diverse disciplines as marketing, economics, production technology, and biotechnology. This diversity is reflected in the types of research projects included in the present study.

Included in the study were the buyers of research projects which were completed during the years 1999 and 2000. These include 113 projects conducted for 80 organisations.

Due to a lack of secondary data, we collected primary data by means of a questionnaire. The questionnaire was sent to the person who had been in charge of the project in the buyer organisation. After two phone calls to those organisations which did not return the questionnaire, 65 organisations had responded (81% of the total number of organisations), representing 86 research projects (76% of the total number of projects). The responding organisations were relatively small. Some 75% of the organisations had less than 100 employees. The average turnover is 538 million NOK (58 mill US$). The 65 responding organisations represent different types of organisations: 61.5% are business firms, 18.5% are governmental bodies, 7.7% are research institutions and 6.2% are trade organisations. The remaining 6.2% are other types of organisations.

Measurement

The constructs included in this study are research use (USE), cooperation (COOP), and assistance (ASSIST). Although much has been written about research use, no standardised measures for the constructs employed here have been developed so far. Thus, we had to construct appropriate measures for our study. In this process, we relied heavily on the relevant research literature to see how other researchers had defined the same or similar constructs. In line with Churchill's (1979) procedure for measurement development, we first specify the domain of each construct. We then proceed to describe how we generated valid and reliable measures to capture the theoretical constructs as specified.

Research use: A review of the literature on research use revealed great diversity in the way research use has been defined and measured (Menon & Varadarajan 1992). Thus, a standard definition of research use does not appear to exist (Menon & Varadarajan 1992; Moorman et al. 1992). In the present study, we focus on the *impact* dimension of the research, i.e., whether the completed research influences the users' thinking, decisions and actions (cf. Deshpandé 1982; Dunn 1986). Furthermore, we emphasise that research use can be both of a conceptual and instrumental type. Instrumental use refers to the direct application of research results to solve a specific problem or to guide concrete decisions and actions (Caplan et al. 1975). Conceptual use involves using research results for "general enlightenment" (Beyer & Trice 1982, p.598), i.e. research information that changes the user's knowledge without being applied directly for specific decisions and actions.

Cooperation: Regarding the construct of "cooperation", we emphasise the importance of interactions and involvement during the project. We also focus on the ability of the

research provider to solve problems and challenges which emerge during the project. We focus on personal communication because it makes it possible to immediately to clarify and elaborate unclear issues, and to discover possible differences in interpretations (Daft & Weick 1984). More specifically, we emphasise the extent to which the researcher and user has an ongoing dialog during the project, as well as the availability of the research provider's project managers during the project.

Assistance: Regarding assistance, we focus on researchers' assistance in interpreting the results and clarifying their significance for the user's organisation, as well as how the results could be applied.

To measure these constructs, we developed a pool of items that seems to reflect the theoretical constructs. In addition to examining previous research, we made use of the authors' extensive experience as providers of commissioned research in our effort to formulate items that reflect the specified domain for each of the theoretical constructs. The items were pretested on eight researchers with extensive experience with commissioned research. After this procedure, we ended up with 12 items which are assumed to measure the constructs included, i.e., 4 items which reflect research use, 5 items which reflect cooperation, and 3 items which reflect assistance. These items are shown in Appendix 1. All items were rated on a 7-point Likert scale with end-points 1 = "strongly disagree" and 7 = "strongly agree". Each measure was arrived at by dividing the sum of the scores for each item by the number of items included in the measure. The reliability of the scales for the measures were found to meet Nunnally's (1978) recommendations, as the Chronbach's alfa (α) exceeded 0.70 for all of the constructs (presented in Appendix I).

To determine the dimensionality underlying these measures, we used exploratory factor analysis on the items which are assumed to reflect each measure (cf. Churchill 1979). Exploratory factor analysis was applied due to a lack of prior testing of the measures. This procedure showed that two of the measures, i.e. cooperation and assistance, displayed a unidimensional structure, representing 73% and 87% of the variance in the items, respectively (see Appendixes 2 and 3). Our measure of research use displayed a two-factor solution reflecting instrumental and conceptual research use (see Appendix 4). However, in estimating the discriminant validity for the three measures (with the cut-off point eigenvalue = 1), as discussed below, a clear three-factor solution emerged. Thus, we decided to consider USE a one-dimensional construct. An examination of the correlation coefficients between the items included in the USE-measure showed that they all were positive and high, and that the intercorrelations also were higher than correlations with indicators which measure the other

constructs. Thus according to the idea of M(ulti) T(raits) M(ulti) M(ethods), (see, Campbell & Fiske 1959) our choice seems appropriate.

To determine whether the measures reflected distinct constructs we conducted a factor analysis using varimax rotation on the 12 items that represent the three constructs in the research model (cf. Churchill 1979). Table 1 reports communalities, factor loadings, variance explained, and eigenvalues for the measures.

Table 1. Assessment of Discriminant Validity for the Measures

Items: (for description of items, see Appendix 1)	Communalities	Factor 1: COOP	Factor 2: ASSIST	Factor 3: USE
COOP1	.795	**.873**	.052	.176
COOP2	.662	**.796**	.169	-.010
COOP3	.676	**.792**	.088	.205
COOP4	.701	**.773**	.091	.309
COOP5	.780	**.714**	.395	.340
ASSIST1	.905	.060	**.938**	-.147
ASSIST2	.839	.080	**.912**	-.012
ASSIST3	.725	.294	**.799**	-.010
USE1	.660	.170	-.115	**.786**
USE2	.664	.062	-.249	**.774**
USE3	.607	.369	.167	**.666**
USE4	.405	.211	.388	**.458**
Variance explained	-	39.4%	21.2%	9.6%
Eigen Values	-	4.73	2.55	1.15

Exploratory factor analysis with varimax rotation. Three-factor solution with cut-off point at eigenvalue = 1.

Table 1 shows that with a cut-off point at eigenvalue = 1, the factor analysis extracted three factors. Factor 1 represents cooperation (COOP), factor 2 assistance (ASSIST), and factor 3 research use (USE). The three factors represent 70% of the variance in the 12 items. We see that all factor loadings are greater than 0.47 and that all cross-construct loadings are smaller than the corresponding own-construct loading. Jointly these facts indicate that the three measures are sufficiently distinct.

Results

In this section, we report the findings of our study. Table 2 provides some descriptive statistics as well as correlation coefficients between the measures.

Table 2. Descriptive Statistics and Correlation Coefficients for the Measures

	N	Mean (SD)	1.	2.	3.
1. USE	52	4.70 (1.22)	1.00		
2. COOP	72	5.70 (1.15)	.516**	1.00	
3. ASSIST	59	4.73 (1.34)	.075	.493**	1.00

** = p< .01

Table 2 shows that the two independent measures are positively correlated (r = 0.493, p< .01) and thus collinarity problems may exist. Tests for collinarity revealed that the tolerance measures (<0.815) and VIF-values (<1.228) for the two independent measures were well below the threshold values recommended by Hair et al. (1998). Therefore, collinarity appears not to be a serious problem here.

To test the two hypotheses, regression analysis was applied to estimate the effects of cooperation (COOP) and assistance (ASSIST) on research use (USE). The result of the regression analysis is shown in Table 3.

Table 3. Regression Analysis: Dependent Variable: Research Use (USE)

	Stand. β (t-values)
COOP	.556 (3.827)***
ASSIST	-.149 (-1.009)
	R^2 = 0.260**

** = p< .01, *** = p< .001, n = 45

Table 3 shows that the regression model explained 26% of the variance in the dependent variable (p < 0.01). The data here also shows that H1 is supported, i.e. that the degree of cooperation between research providers and users co-varies positively with the use of commissioned research. Furthermore, Table 3 shows that H2 is not supported, i.e. that qualified assistance in interpreting and applying the research results does not co-vary with its use. The latter finding is surprising and against our theoretical arguments. We elaborate and discuss this at more detail in the next section.

Discussion

In the theoretical discussion at the beginning of this article, we argued that researchers and users of research are likely to differ in their knowledge of and expectations to (commissioned) research. We also maintained that this "gap" might lead to the production of irrelevant research and/or impair the utilisation of research. Empirical support was found for the argument that cooperation during the production of the research enhances its use. Our results did, however, not support the argument that researchers' assistance in interpreting and applying the research results enhances its use. Because this was a rather surprising result, we carefully reconsidered our approach, including the measures and how they relate to each other. More specifically, we went back to our original USE measure and examined how its two components, i.e. instrumental (INSTUSE) and conceptual (CONUSE) use (see Appendix 4), relate to our measures of cooperation and assistance. In Table 4, we report the correlation coefficients between these measures.

Table 4. Descriptive Statistics, and Correlation Coefficients for the Measures

		N	Mean (SD)	1.	2.	3.	4.
1.	INSTUSE	55	3.67 (1.72)	1.00			
2.	CONUSE	72	5.67 (1.16)	.407**	1.00		
3.	COOP	72	5.70 (1.15)	.336*	.511***	1.00	
4.	ASSIST	55	4.73 (1.34)	-.147	.287*	.493***	1.00

* = p< .05, ** = p< .01, *** = p< .001

The correlation matrix presented in Table 4 reveals that cooperation correlates positively with both instrumental and conceptual research uses. We also see that assistance is negatively related to instrumental use, though the results are not statistically significant. In sum, this indicates that assistance is less important to well-understood and "clear-cut" use, but also that cooperation enhances (instrumental knowledge) use and may make subsequent assistance unnecessary. To test whether cooperation may substitute assistance, we computed the partial correlation coefficient between instrumental use and assistance, controlling for the effect of cooperation on instrumental use. The partial correlation between instrumental use and assistance, controlling for cooperation, is negative, i.e. $r_{\text{INSTUSE , ASSIST . COOP}} = -.3025$ ($p<.05$). Compared to the zero-order correlation between instrumental research use and assistance (cf. Table 4), the partial correlation coefficient is larger. This supports our above argument and suggests that cooperation may substitute subsequent assistance. The finding can be explained as follows: Through cooperation during the production of research, users may acquire the

insights which are needed in order to understand and apply the final research results. Through cooperation during the production of the research, users also have the possibility to influence the research itself and thus make it more useful – which should enhance its use. Jointly these factors may explain why subsequent assistance in understanding and applying the research results might be unnecessary.

What about conceptual use – is assistance necessary? The partial correlation between conceptual use and assistance controlled for cooperation, is rather small, i.e. $r_{\text{CONUSE , ASSIST . COOP}} = .0652$ (not significant), and substantially smaller than the zero-order correlation between conceptual use and assistance, i.e. $r = .287$ (cf. Table 4). The large reduction in the correlation coefficient between the two measures indicates that cooperation may reduce the need for assistance also when it concerns the use of conceptual research. Another interesting finding is that the negative partial correlation between instrumental use and assistance (-.3025, $p<.05$), compared to the weak positive partial correlation between conceptual use and assistance (.0652, not significant), indicates that conceptual research use is perceived as more demanding by the user.

Implications

Our study provides empirical support for the often assumed, but little examined assumption that cooperation during the production of the research enhances its use. The practical implication of this finding is that both researchers and buyers of research projects should try to organise their relationship in a manner which facilitates all necessary cooperation in commissioned research. Note that this includes a constant personal dialog, which serves to focus the research effort and to clarify and elaborate ambiguous issues. Cooperation also includes researchers' accessibility and active involvement in the project, as well as the effective handling of problems and challenges that typically emerge during a project.

An additional and important contribution of the present study is the finding that cooperation may *substitute* assistance in enhancing research use. This finding is new and has several interesting practical implications. First, when the cooperation between researchers and users has worked well, subsequent assistance may be superfluous. Second, if cooperation during the production of the research, for some reason or other, was insufficient, subsequent assistance may – to some extent – compensate for the lack of cooperation. It should, however, be noted that because assistance occurs *after* the research has been produced, it can *not* help improve the usefulness of the research, as can cooperation. Thus, the research provider should

not focus on assistance as a pure substitute for cooperation; rather, assistance can be very useful when cooperation – for some reason – is insufficient or fails. In terms of providing qualified assistance, two factors should be emphasised. First, highly qualified personnel should be readily available for the buyer of the research. Second, researchers providing assistance must, in addition to research competence, have sufficient knowledge of the research user and his or her context and requirements.

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Appendix I. Description of Items for the Constructs

Constructs:	Items:
COOP α = 0.90	• We had an ongoing dialog with Alfa during the project • It was easy to get in contact with Alfa's manager for the current project • The cooperation between Alfa and ourselves worked well during the project • Alfa actively contacted us to follow up on the project • Alfa's employees showed a good ability to solve different problems and challenges that emerged during the project
ASSIST α = 0.92	• Alfa's researchers helped us understand the significance of the results for our company • Alfa's researchers helped us understand how the results from the project could be applied by our company • Alfa's researchers helped us interpret the results from the project
USE α = 0.72	• The results from the project have led to concrete changes in our company • Through the project we have enhanced our competitiveness • The results from the project make an important basis for our decisions • The results from the project have enhanced our insights into the relevant domain

Appendix 2. Assessment of Unidimensionality: COOP

Items: (for description of items, see Appendix 1)	Communalities	COOP
COOP1	.782	.885
COOP2	.692	.832
COOP3	.687	.829
COOP4	.718	.847
COOP5	.756	.869
Variance explained	-	72.7%
Eigenvalue	-	3.64

Exploratory factor analysis with varimax rotation. One-factor solution with cut-off point at eigenvalue = 1.

Appendix 3. Assessment of Unidimensionality: ASSIST

Items: (for description of items, see Appendix 1)	Communalities	ASSIST
ASSIST1	.919	.959
ASSIST2	.897	.947
ASSIST3	.790	.889
Variance explained	-	86.9%
Eigenvalue	-	2.61

Exploratory factor analysis with varimax rotation. One-factor solution with cut-off point at eigenvalue = 1.

Appendix 4. Assessment of Unidimensionality: USE

Items: (for description of items, see Appendix 1)	Communalities	Factor 1: INSTUSE	Factor 2: CONUSE
USE1	.772	**.848**	.230
USE2	.820	**.905**	.004
USE3	.718	.467	**.707**
USE4	.868	.000	**.932**
Variance explained	-	43.9%	35.6%
Eigenvalues	-	2.17	1.00

Exploratory factor analysis with varimax rotation. Two-factor solution with cut-off point at eigenvalue = 1.