Katharina J. Srnka/Sabine T. Koeszegi*

From Words to Numbers: How to Transform Qualitative Data into Meaningful Quantitative Results**

Abstract

In proposing a procedure for transforming qualitative data into quantitative results, we address the manifold requests for discovery-oriented research in the business disciplines. We present a systematic classification of combined qualitative-quantitative research designs and argue in favor of the generalization model. We give guidelines for its implementation and provide a blueprint for systematically converting respondents' words into numbers that can be used for further (statistical) analyses. We delimit and discuss the stages of unitization, categorization, and coding. We also raise quality issues and propose relevant quality criteria in the transformation process. In particular, we suggest the intercoder consistency-matrix for determining the incisiveness of categories developed through content analysis. Finally, we demonstrate in an exemplary study how the blueprint can be applied and highlight the benefits of the proposed research design.

JEL-Classification: M19.

Keywords: Combined Research Design; Content Analysis; Electronic Negotiations; Mixed-Method Research; Qualitative Research; Theory Development.

1 Introduction

In view of the current developments and the dramatic changes over the last decades, acting successfully in today's business environment requires a better understanding of human behavior in complex contexts. Academics in the business sciences thus face a growing need to develop relevant new theory adding to the total body of knowledge (Healy and Perry

* Katharina J. Srnka, Associate Professor of Marketing at the Faculty of Business, Economics, and Statistics, University of Vienna, Bruenner Str. 72, A-1210 Vienna, Tel.: (+43)-1-4277-38020, e-mail: Katharina.Srnka@UniVie.ac.at; Sabine T. Koeszegi, Associate Professor of Organization and Planning at the Faculty of Business, Economics, and Statistics, University of Vienna, Bruenner Str. 72, A-1210 Vienna, Tel.: (+43)-1-4277-38178, e-mail: Sabine.Koeszegi@UniVie.ac.at.

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(2000); Deshpande (1983)). Arguing that qualitative research contributes to discovery and theory-building, several authors plead for more qualitative methods in the business and management sciences (e.g., Laurent (2000); Tomczak (1992)). Nevertheless, despite increasing interest in theory-enriching qualitative studies, social scientists still work mostly within the positivistic paradigm and its requirement that hypotheses be tested with statistical rigorous methods.

To reconcile the seemingly contradictory demands of theory development and the application of rigorous research techniques, mixed-method studies have been suggested. Such studies combine the strengths of both approaches and are apt to reveal what neither qualitative nor quantitative research alone may have found. An increasing number of scholars in the social sciences advocate the systematic combination of qualitative and quantitative methods (Mertens (2005); Creswell (2003); Tashakkori and Teddlie (2003); Newman and Benz (1998)). Mixed-method research has gained acceptability and becomes increasingly popular in empirical management research (Bazeley (2004); Gibson and Duncan (2002)).

Despite the acknowledged advantages of combined methods research by those who have applied it, so far, few researchers have used such a design. A literature review conducted by Trumbo (2004), comprising 2,649 articles, illustrates the lack. Although several qualitative-quantitative studies have been reported in other areas of the social sciences (e.g., health care, nursing, education or family planning, etc.), combined research efforts have been rare in the business disciplines (Sale, Lohfeld, and Brazil (2002)). Systematic qualitative-quantitative studies so far have only been conducted in "niches" of business research, such as tourism or sports marketing (e.g., Davies (2003); Jones (1997)). There seem to be three major reasons for the prevailing absence of qualitative-quantitative research.

(1) *Incommensurability of research paradigms*: For a long time, qualitative and quantitative research have been seen as irreconcilable extremes of the epistemological continuum based on different ontological assumptions (Davies (2003); Hirschman and Holbrook (1992)). Today, it seems that pragmatism has overruled purity, as the perceived benefits of combined research are now seen as outweighing the philosophical difficulties of their use (Miles and Huberman (1994); Rossman and Wilson (1985)).

(2) *Lack of rigor in qualitative research*: Many scholars consider qualitative techniques as unsystematic and not rigorous enough to provide reliable results (Richards (2004); Lilford and Braunholtz (2003)). Qualitative procedures involve creative processes that indeed are difficult to measure. The quality of the outcome depends to a great extent on how systematic the researcher is in analyzing qualitative material. Since the methods in this process differ from those in quantitative analyses, they certainly require specific criteria to evaluate their quality. Extensive efforts have been made to develop validity and reliability measures for qualitative research (Sykes (1991)) and various criteria for the evaluation of mixed-method research have been proposed (e.g., Caracelli and Riggin (1994)). Guetzkow's *U* and Cohen's *kappa* are examples of such criteria that

have been frequently applied and which have proved useful for determining intercoder reliability (Weingart, Olekalns, and Smith (2004)).

(3) *Missing guidance for systematic combined qualitative-quantitative research*: A rigorous procedure for data gathering and analysis contributes to the validity and reliability of research that merges qualitative and quantitative methods (Miles and Huberman (1994)). So far, a formal framework, which enhances reliability and contributes to the credibility as well as acceptance of qualitative research, is still missing. A clearly defined procedure would be helpful for researchers who are less experienced in combined research methods. Moreover, a defined procedure can provide a structure for reporting the steps and methods applied in a combined research project, which would allow other researchers to better understand, evaluate, and replicate such studies (Gibson and Duncan (2002); Trumbo (2004)). As several studies have pointed out (e.g., Creswell (2003); Davies (2003)), we still lack a blueprint that researchers who plan to conduct combined research can follow, and, if necessary, adapt to their specific problem. The main purpose of this article is to provide such a blueprint and guidelines for its implementation.

2 Designing qualitative-quantitative research

The proliferation of workshops[1] and a rising number of publications[2] on the topic reflect the increasing interest in mixed methods and combined designs among researchers. The social sciences literature describes several models for blending qualitative and quantitative approaches. Davies (2003) suggests various types of combined research based on the work of Miller and Crabtree (1994), and Creswell (2003) further develops the classification proposed in his earlier work (Creswell (1994)). Mayring (2001), a methodologist in the field of psychology, outlines four types of qualitative-quantitative research. Following Mayring's classification, *Table 1* summarizes the various mixed research-designs that have been described in the literature and outlines their aims. The overview suggests that there are two broad types of mixed designs: two studies-designs and integrated designs.

1 Examples are: *Workshop Kritische Reflexion empirischer Forschungsmethodik,* Verband der Hochschullehrer für Betriebswirtschaft e.V., Kommission Wissenschaftstheorie für Nachwuchswissenschaftler/innen, Berlin, September 7-9, 2006; *Workshop Mixed Methodology in Psychological Research*, Black Forrest/Germany, October 22-24, 2004; and *IPPRA-CORNELL SAGA Workshop on Qualitative and Quantitative Methods for Poverty Analysis*, Nairobi/Kenya, March 11, 2004.

2 e.g., Greene and Caracelli (1997); Newman and Benz (1998); Tashakkori and Teddlie (2003); Mertens (2005).

Table 1: Qualitative-Quantitative Research Designs

Qualitative-Quantitative Research Designs			Mayring (2001)	Davies (2003)	Creswell (2003)	Creswell (1994)
Description Qualitative data and quantitative data are collected and analyzed in sequential order. *Aim* Investigate under-researched field, to develop hypotheses or create instruments for subsequent quantitative measurement, or provide explanations.	**Two-studies designs**	Sequential two-studies design	Preliminary study model	Sequential design	Exploratory/ Explanatory design	Two-phase design
Description Both, quantitative and qualitative data are collected and analyzed in separate procedures. *Aim* Cross-validate or corroborate findings of the two approaches.		Concurrent two-studies design	Triangulation model	Concurrent design/ Nested design	Triangulation design/ Nested design	Dominant less-dominant design
Description Quantitative data is analyzed using qualitative procedures. *Aim* Investigate and understand the problem in depth, derive new theoretical insights.	**Integrated designs**	Integrated elaboration design	Elaboration model	Combination design	Transformative design	Mixed-methodology design
Description Qualitative material is collected and transformed into categorical data for further quantitative analysis. *Aim* Derive both theory and generalizable results.		Integrated generalization design	Generalization model			

In a *two studies-design,* the researcher collects and analyzes qualitative and quantitative data respectively in separate (either sequential or concurrent) studies. Researchers who use an *integrated design* combine qualitative and quantitative phases of analysis within one single study. While the two studies-design represents the traditional approach that is more frequently applied, the integrated design constitutes a relatively new approach that is still developing (Creswell (2003)). In the following subsections, we address the two types of designs in detail.

2.1 Traditional two studies research designs

The combination of two separate studies – one that collects and analyzes qualitative and the other quantitative data – has traditionally been considered acceptable to researchers in the social sciences. The *sequential design* constitutes the most typical form of combined research (and in some instances even more than just one qualitative and one quantitative study are combined). In new or underdeveloped areas, it is common to apply qualitative methods in a preliminary stage, thus enabling the researcher to develop a conceptual framework, to generate hypotheses, or to establish the necessary tools (particularly instruments for measurement) for the quantitative study (Lilford and Braunholtz (2003); de Ruyter and Scholl (1998); Morgan and Smircich (1980)). On the other hand, the researcher can collect qualitative data in a post-hoc study to illuminate puzzling quantitative findings and to support interpretation (Gibson and Duncan (2002)). Although less often than the sequential approach, the *separate study design* (either concurrent or nested design) has also been repeatedly applied. Researchers taking this approach, separately collect and analyze qualitative and quantitative data on the same subject. Merging the results provides an overall picture of the research problem.

2.2 Integrated qualitative-quantitative research designs

In research following an integrated design, the same data are treated both hermeneutically and statistically (Bazeley (2004)). Starting from one type of data – either qualitative *or* quantitative – qualitative and quantitative analyses are combined within one single research process (see Kukartz (1995); Ragin (1987; 1995)). Fort his purpose, the researcher must transform the data (in the case of quantitative data) into qualitative themes or (in the case of qualitative material) into codes and quantitative numbers (e.g., Mertens (2005)). When quantitative data are subsumed to subsequent stages of qualitative analysis, the problem under investigation can be more exhaustively elaborated. Thus, this combined approach reflects an *elaboration model*. It represents a very efficient form of deriving deeper insights from empirical evidence. If, on the other hand, the researcher starts from qualitative material and transforms it into numerical data to be used for further quantitative analysis aimed at deriving generalizable results, she or he applies a *generalization design* (Mayring (2001)). Research that follows this model starts from open-format data and applies a systematic qualitative procedure to convert it into nominal data that can be used for further quantitative analyses.

In contrast to the two study-designs familiar to most researchers in the business disciplines, integrated research designs have more recently been proposed in the literature. In sales forecasting, for instance, Diamantopoulos and Mathews (1989) contrast the preparation of an objective forecast followed by subjective evaluation and revision (elaboration model) with the use of managers' subjective judgments as an input to objective model-based methods (generalization model). While very few studies apply the elaboration model (e.g., Srnka, Grohs, and Eckler (2003)), the generalization model guides some investigations in various areas of management research, particularly in organizational studies. For instance, several studies on bargaining (e.g., Putnam and Jones (1982)) and negotiation behavior (Brett, Shapiro, and Lytle (1998); Weingart et al. (2004)) have followed this approach. These studies suggest that the generalization model represents a research approach that successfully accomplishes two goals. Firstly, it provides significant insights into the research problem and thus responds to the many calls for discovery-oriented research. Secondly, it assures scientific rigor and allows deriving generalizable results from qualitative data.

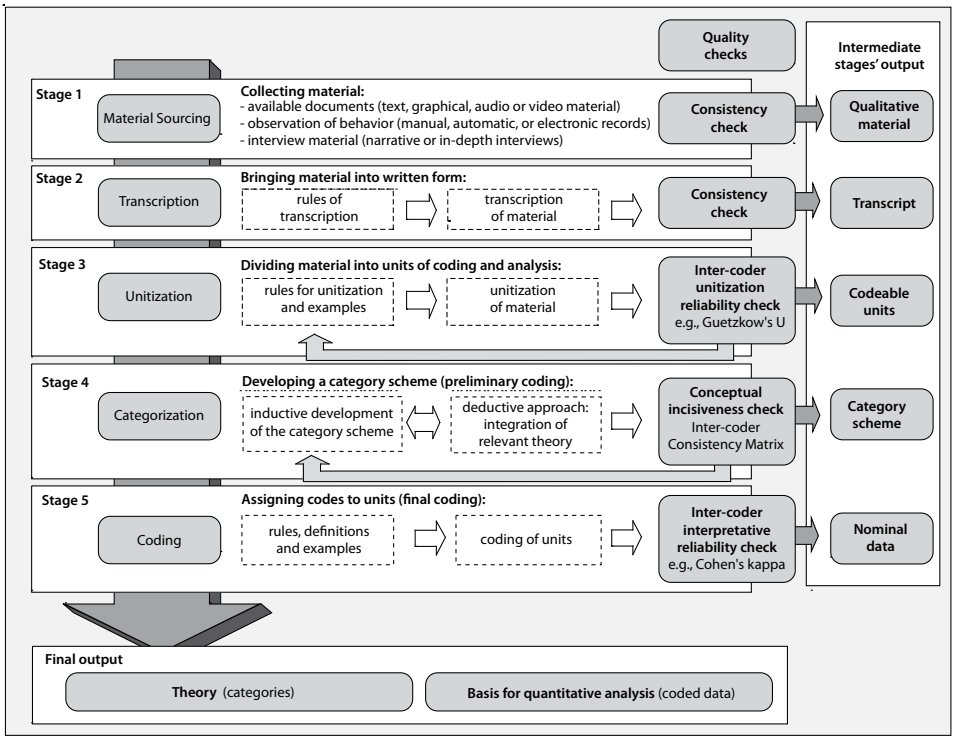
3 Guidelines for generalization design-research

Integrated qualitative-quantitative research should be based on clearly defined rules, and the process needs to be meticulously documented so that the theoretical conclusions reached can be followed and verified intersubjectively. Since most researchers are experienced in either qualitative *or* quantitative research, a general framework and rigorous quality measures are needed to provide guidance for data collection and analysis in integrated studies (Bazeley (2004); Creswell (2003)). We aim at assisting interested researchers by proposing guidelines for research following the generalization model. Below, we outline a blueprint for systematically analyzing qualitative material to derive both new theory and numerical data (i.e., count data) for further analysis. Furthermore, we propose criteria to ensure the validity and reliability of the results of such research. In the subsequent section, we demonstrate how these guidelines can be implemented in a particular research project.

3.1 A Blueprint for systematically analyzing qualitative material

In a generalization design study, qualitative material is inductively explored (informed by extant theory) and then coded. Applying a systematic procedure, *new theory* as well as a *basis for quantitative analyses* can be derived. *Figure 1* shows that this procedure comprises five major stages, each of which generates a certain output.

Figure 1: A Blueprint Providing Guidelines for the Qualitative Analysis Process



In the beginning of the process (stages 1 and 2), the qualitative material is collected and transcribed (usually from audio or visual sources) into text form. The output of these stages is the basis for the analysis and determines the overall quality of the research. Yet, most studies say nothing about these two stages. In the literature on qualitative research much attention has been devoted to the coding stage (stage 5), whereas few authors elaborate on the unitization (stage 3) and the categorization (stage 4). These stages, during which *codeable units* and the *category scheme* are created, reflect the qualitative process of *content analysis* (Druckman and Hopmann (2002); Krippendorff (1980)). Besides transcription that can also be very time-consuming, stages 3 and 4 typically absorb the most energy and resources, because they usually need to be reiterated in multiple cycles (indicated in *Figure 1* by backwards arrows). The fact that the procedure followed in the content analysis of the data often is not (or at least not clearly) explained might cause problems in the validity and reliability of their output. To provide a structure for analyzing qualitative material and transforming it into quantitative data, we distinguish and describe the various stages below.

Stages 1 & 2: Data sourcing and transcription – Creating the basis for qualitative analysis: When the data are readily available (e.g., graphical material or text documents) or when

verbal material already exists in written form (e.g., responses in an online-questionnaire or electronically logged communication) the first two stages do not apply. In all other cases, both data collection and transcription require rigor and sophistication and should be reported in detail. If data need to be collected and transcribed, various problems may arise in data sourcing and transcription. A major concern in this context is language differences. In terms of responses, gathering and analyzing data in the respondents' own language would provide highest validity, because language itself reflects cultural phenomena and particularities. Collecting the data in different languages, however, requires researchers from different countries to do a systematic translation and back-translation of the material. If such a procedure is possible at all, it is very time-consuming and costly. Although also not entirely unproblematic (see Ohnesorge (2004)), using a "lingua franca" (usually English) in data collection and transcription can be considered as a good and pragmatic alternative.

Stage 3: Unitization – Choosing the unit of analysis and dividing the material into coding units: Correctly defining the unit of analysis is a crucial first-step decision that is essential for the systematic analysis of qualitative material (Holsti (1969)). In most studies, though, the unit of analysis evolves implicitly rather than being determined explicitly (see, e.g., Ohnesorge (2004); Zechmeister and Druckman (1973)). Which unit will best serve as the basis for coding and subsequent analysis depends on the data and the research objective. If data are available in the form of word associations or short statements, they usually can directly be used as units of analysis, provided that these units are useful for the purposes of the research project. If, however, the material is available in the form of longer text (e.g., logged communication or transcribed narratives), then the material needs to be unitized for further treatment. The focus of the research question determines whether words, sentences, or text chunks are chosen as communication units on which coding and analysis are based (for a comprehensive discussion see Simons (1993)). Many authors tend to use text chunks – either large text chunks (such as speaking turns, i.e., a communicator's complete statement sandwiched between one or several other communicators' statements) or smaller text chunks (mostly verb-object sequences). Text chunks, though, do not necessarily constitute the most useful unit for the analysis at hand. Rather, we consider *thought units*, also denoted as "sense units" or "units of meaning" (see, e.g., Buber, Gadner, and Richards (2004)), as the best basis for coding and analysis in most instances. These units comprise one idea communicated, no matter whether it is expressed in a sentence, a verb-object sequence, a single word, or just one sign (e.g., emoticons such as "☺"), or punctuation marks ("?", "…" etc.).

Stage 4: Categorization – Developing a scheme of categories relevant to the research problem: The next step is categorization, the process of structuring and condensing data by grouping the qualitative material in theoretically insightful ways (Mayring (2002)). Categorization is an informed and at the same time creative process that needs to be performed by skilled and experienced researchers (coding, which is the implementation of the categorization by executing clearly defined coding rules based on the category scheme in contrast can be carried out by trained personnel, e.g., research assistants). Before starting the categorization procedure, researchers have to make fundamental decisions on the following issues: (a) How much of the unitized material should be used to develop the category scheme?

(b) Should existing categories be used or new ones developed? (c) How detailed should the category scheme be? (d) Should a hierarchical or a single-level category scheme be developed? These decisions to a large extend depend on the particular project, so that are no general rules for these issues. To help in conducting generalization design-studies, though, we formulate the following basic guidelines.

(a) We strongly suggest to use the entire data (rather than only selected parts, which on first sight seem to be of relevance for the problem under investigation) to develop the category scheme. Using all the material helps to capture all the relevant contents of the qualitative material and to avoid selection bias. However, for very large samples for which such a procedure is not feasible, a balanced random sub-sample of the material can be drawn. In this case, the criteria for selection of the balanced sample frame should be explained in the study report.

(b) In developing the category scheme, the criterion of reliability would induce analysts to promote "standard categories" (derived from theory) that could be repeatedly used. The criterion of validity, on the other hand, suggests the (inductive) development of original systems that capture the essence of the phenomenon (Druckman and Hopmann (2002)). We suggest a *deductive-inductive procedure*, because it combines the advantages of both approaches. Starting with categories identified in the literature, the category scheme can be adapted in reiterative steps to the specific research problem or content of data.

(c) The more detailed the category scheme, the better it reflects the particular meaning of the unit to be coded, and the higher is thus its validity. Also, data coded with a detailed scheme can be used more flexibly in the analysis (because it can be easily condensed by collapsing categories, whereas disaggregating data requires a new process of coding). A very precise category scheme, however, makes coding harder and usually leads to lower intercoder reliability. Hence, there is a trade-off between precision (validity) and intercoder consistency (reliability). As a guiding principle, we advise researchers to develop a *category scheme that is as precise as possible* so as to maximize validity of the study results. Reliability of the data coded on the basis of a very detailed category scheme usually can be improved by more precisely defining and specifying coding rules.

(d) Category schemes can be built in a hierarchical form (i.e., by defining main categories as well as subcategories, thereby representing not only the concepts but also their relationships). However, it is also possible to build categories without defining hierarchies. Although this decision very much depends on the research subject, our experience is that *hierarchical category schemes* usually are theoretically insightful and valid. Also, they tend to contribute to higher reliability, because they are more concise and thus easier to handle in data coding.

Stage 5: Coding – Assigning category codes to text units: Coding means the systematic assignment of codes (numbers) to units based on the category scheme. Category definitions and key anchors serve as rules that can ensure consistent coding.

3.2 Criteria for "good" science

The accepted view in the business and management sciences is that "good" science is based on research leading to results that are valid, reliable, and thus generalizable. A major requirement is that the methods and the results can be subjected to scrutiny, and that they allow for comparison and replication (Lilford and Braunholtz (2003); Jones (1997)). Qualitative material provides a basis for (valid) theory development, but offers little structure for (reliable) analysis. There are only limited means for making an objective quality evaluation regarding qualitative techniques that is comparable to reliability measures used in quantitative studies. In qualitative research, intersubjectivity contributes to outcomes that are both verifiable and reproducible (Denzin and Lincoln (1998)). Intersubjectivity of the process of qualitative research and the results it produces can be afforded by fulfilling the several requirements (Kleining and Witt (2001)), which we outline below.

Systematic design of data collection: To achieve reliability and generalizability, the method and context of qualitative data collection need to be systematically planned and executed (Miles and Huberman (1994)). Comparable to the procedure followed in quantitative studies, data collection should be structured and carried out according to clearly defined stages and rules (Mayring (2001); Jensen and Jankowski (1991)).

Structured procedure and documentation of data analysis: In many studies, the lack of detail in the information given on the procedure does not allow the reader to follow how researchers got from open-format material to their final conclusions (Huberman and Miles (1998)). Descriptions, if any, are often limited to formulations such as "categories were formed via inductive analysis of the data conducted by the researcher" (Bowker (2001, 10)). Yet, for reliable findings, meticulous documentation and concise disclosure of the entire analysis process, including all stages and intermediate outputs, is necessary. Not only do clear specifications help researchers themselves to detect wrong codings and, if necessary, to recode the data-set more easily, but they also allow others to understand and replicate a study (Flick (2002)).

Multiple-person involvement and quality checks: Involving several individuals subjects both the analysis and the results to intersubjective scrutiny (Denzin (1975)). Independent evaluations of at least two experts are necessary in defining categories and independent judgments of a minimum of two well-trained coders are required in delimiting units of analysis (unitizing reliability) and in coding them (interpretative reliability). For intercoder checks of consistency in unitizing and coding, various *quality criteria* (reliability measures) have been developed. A discussion of criteria besides frequently used Guetzkow`s *U* and Cohen's *kappa* (Scott's *pi*, Krippendorff's *alpha*, etc.) as well as instructions for their calculation can be found in Folger, Hewes, and Poole (1984), Brennan and Prediger (1981), and Holsti (1969). In contrast, no method has so far been suggested to evaluate the appropriateness of inductively derived or adapted categories. As a relatively simple instrument to determine the incisiveness of categories, we suggest creating *an intercoder consistency-matrix* after a preliminary coding round in the stage of categorization.

Table 2: Intercoder Consistency-Matrix

Coder 1/ Coder 2	Category 1	Category 2	Category 3	…	…	…	…	…	Category *n*
Category 1									
Category 2									
Category 3									
…									
…									
…									
…									
…									
Category *n*									
Total									
Agreement (%)									

Such a matrix, as shown in *Table 2*, cross-tabulates the codings of coder 1 (columns) and coder 2 (rows) and can be generated using an Excel spreadsheet. The matrix shows intercoder classification correspondence rates for all categories defined (shaded fields in *Table 2*) and identifies systematically differing classifications. Such discrepancies indicate ambiguities for the particular categories. Systematic inconsistencies indicate that coders interpret units differently, that the category scheme is inappropriate for representing the data, or coding rules imprecise. The intercoder consistency-matrix (which will be illustrated in our study below) shows which categories should be redefined and which coding rules need to be better specified to increase validity. Finally, the quality of results can (and should) be enhanced through cross-validation with other studies or data from complementary sources (Weber (2004)).

3.3 Output of qualitative content analysis – Input for quantitative analyses

The systematic process of content analyzing qualitative material results in two major final outputs. On the one hand, it leads to *new theoretical insights* on the particularities in the field of interest reflected in the adapted category scheme and the newly developed categories in particular. On the other hand, it provides *coded data* that can be used for subsequent quantitative (exploratory, descriptive, or hypotheses testing) analyses. In the following section, we will give an example of how coded data can be used for quantitative exploratory procedures and theory testing.

4 Conducting integrated qualitative-quantitative research: An exemplary study applying the generalization design

Many interested researchers do not perform a qualitative-quantitative study because they find little guidance in the literature for such an endeavor. Here, we demonstrate the application of the research plan and quality criteria discussed in the preceding section. Before we give a detailed description of the qualitative and the quantitative analyses, we briefly outline the research problem, design, and subjects of the study chosen for illustration.

4.1 Research problem, design, and subjects

In this study, we explored negotiation processes conducted with the help of electronic negotiation systems (eNS). Our basic aims were (a) to identify and understand particularities of electronic negotiations and (b) to describe different negotiation behavior applied by buyers and sellers in e-negotiations. Furthermore, we were particularly interested in (c) identifying behavioral patterns that increase the probability of agreement in e-negotiations.

The study was embedded in negotiation courses at the University of Vienna (Austria) and National Sun Yat-sen University, Kaohsiung (Taiwan, ROC). Students received course credits for participation; no other incentives were offered. A total of 80 graduate students of business administration participated in the negotiation experiment. Traditionally, qualitative research has been characterized by the use of small samples (often between 6 and 30 respondents). Small numbers, however, are not an inherent characteristic of qualitative research (Sykes (1991)). Particularly, if qualitative data is to be transformed and used for further statistical analysis, a larger number of participants will be needed. Yet, most qualitative techniques of data collection result in large volumes of data per participant that need to be processed. Given the often tight restrictions in terms of time, personnel, and financial resources, the optimal sample size for mixed design-studies is somewhere in-between the traditional small number and the large samples typical for quantitative investigations. Our group of 80 participants reflects such a "medium-sized" sample, which could be handled with high accuracy and reasonable effort in terms of time and personnel.

Subjects were paired so that one negotiator was European and the other Taiwanese. The roles (buyer or seller) were assigned randomly. Based on a given case, participants had to negotiate on four issues: price, quality, delivery, and payment. Participants were given a negotiation period of three weeks, but subjects could terminate the negotiation at any point in time before the deadline by either reaching or not reaching an agreement on the case. Negotiations were conducted in English. Subjects registered online for the experiment at a website (http://www.interneg.org/), where they had to fill in a pre-negotiation questionnaire in which they provided user-specific information (including preferences on the four issues negotiated) and demographic data (gender, age, and culture). All communications (offers and messages), log-ins, and time records were logged by the system. Both

system data and the information gathered from pre-negotiation questionnaires were used in the subsequent analyses[3].

4.2 Qualitative analysis: Following the stages of the blueprint

Stages 1 & 2 – Data sourcing and transcription: The basic data were in HTML format. Since full transcripts of the messages exchanged in the negotiations were already available in electronic form, there was no need for transcription. Given that the negotiations had been conducted with English as the "lingua-franca," no translation was necessary.

Stage 3 – Unitization: Messages had to be unitized for coding and further analysis. Given that our focus was on the content as well as on the various formal styles of electronic communication, we chose *thought units* as unit of analysis. Each thought unit conveys one idea communicated by the negotiator to the opponent. Some research on interpersonal communication is based on sentences. This coding unit, however, is more adequate for linguistic studies, such as e.g., in the work of Simons (1993), who investigates speech patterns in face-to-face bargaining. Other researchers use subject-verb sequences, such as., e.g., Brett et al. (1998), who test the effectiveness of different strategies for breaking conflict spirals in negotiations. In some cases, authors for pragmatic reasons have unitized communication into speaking turns (Putnam and Jones (1982); Donohue (1981a, 1981b)). Since in e-negotiations individuals tend to communicate multiple ideas within a message, too much information would have been lost, if we had assigned only one code to an entire speaking turn. The example in *Table 3* demonstrates the procedure we applied to divide the material into thought units.

Table 3: Example of Unitizing: Decomposing Participants' Messages into Thought Units

Dear Susaki, Thank you for your quick answer. I do very much like the idea of a double-win situation. My suggestion of such a situation is this offer: $ 4.12, 45 days delivery, payment 30 days after delivery and returns full price. I am sure, if you think about it, you will find this a fair offer! If not, you really know much about fairness! Hope to hear from you! Kind regards, JD	Dear Susaki,
	Thank you for your quick answer.
	I do very much like the idea of a double-win situation.
	My suggestion of such a situation is this offer: $ 4.12, 45 days delivery, payment 30 days after delivery and returns full price.
	I am sure, if you think about it, you will find this a fair offer!
	If not, you really know much about fairness!
	Hope to hear from you! Kind Regards
	JD

3 Details on the experiment case are available on the above mentioned Interneg-website. A comprehensive description of the experimental design is reported in Koeszegi, Srnka, and Pesendorfer (2006).

Two coders were instructed to independently unitize the text messages. After a first round of unitizing, intercoder reliability-measures were calculated. We calculated Guetzkow's *U*, which measures the reliability of the *number of units* identified by two independent coders, as follows (see Holsti (1969)):

$$U = (O_1 - O_2) \,/\, (O_1 + O_2).$$

O_1 represents the number of units identified by coder 1, and O_2 the number of units identified by coder 2. After the first unitizing run, Guetzkow's *U* equaled .0078, showing almost 100% conformance in the number of units identified by the coders. To check *textual consistency* of the identified units (Weingart et al. (1990)), intercoder unitizing reliability should additionally be calculated (units of coder 1 and coder 2 can be electronically compared using the Excel-program). In our case, textual consistency was as high as 89.49% in the first round, which is considered an excellent result (Simons (1993)). At this stage, researchers must decide whether intercoder consistency is high enough or if another unitizing round should be executed. To guarantee the highest quality material for categorization, we ran a second full turn of unitization in our study. Coders discussed differing unitizations and established precise rules for unitizing the problematic text elements. In the next unitization turn, both coders independently derived the same number of units for all 80 negotiations representing a Guetzkow's of $U = .00$. An anew check of the intercoder reliability on total unitizing decisions showed 96.94 % textual conformance of the identified units, which satisfied our needs. Complete agreement on unitization was reached through discussion and agreement among the coders. Finally, the 40 negotiations were divided into 3,560 units.

Stage 4 – Categorization: In order to benefit from both existing theory and the new information contained in our data, we applied an deductive-inductive procedure in developing categories. We began by reviewing existing coding schemes (deductive step) and chose the most comprehensive of them, Walcott's "Bargaining Process Analysis II" (BPA II)-categorization, as a starting point for the development of adequate categories. This category scheme has sound theoretical foundations (see Putnam and Jones (1982)). It combines elements from a number of earlier coding frames including Bales' popular "Interaction Process Analysis"-categorization, to which most schemes for coding negotiations found in the literature can be traced. The BPA II-scheme is an hierarchical scheme comprising the main categories substantive, task-oriented, persuasive, tactical, procedural, and affective negotiation behavior with each of them containing up to six subcategories. Since its categories do not account for the various formal dimensions specific to written electronic communication, we extended the BPA II-scheme based on the data collected, conceptual considerations and earlier studies. We added the following categories to provide for the particularities of the type of communication reflected in our data: "text-specific units" (i.e., peculiarities of written and computer-mediated communication), "communication protocol" (i.e., formalities in written, computer-mediated communication such as addressings or closings), and "private communication" (i.e., communication on personal topics unrelated to negotiation). Additionally, we provided general definitions for main categories and anchor examples for each subcategory as rules for coders to distinguish between categories. The extended BPA II-scheme comprised nine main categories with several

subcategories in each main category. We added ten 'auxiliary' categories named 'other', one representing a main category and nine being a subcategory in each of the other main categories. These auxiliary categories functioned as 'collecting tanks' throughout the coding process for communication units that did not immediately fit into one of the defined categories.

Beginning with these categories, we continued to develop the category scheme by conducting several rounds of preliminary coding on the whole sample. Throughout this iterative process, we changed, eliminated, added, or collapsed subcategories into new categories based on theoretical considerations (inductive step). The following example of "sarcasm" demonstrates how we proceeded in this stage: When coders found a sarcastic utterance (like "If not, you really know much about fairness!"), which did not fit in any of the existing categories, they coded it into the "other" category. At the end of the coding round, there were several sarcastic thought units in the "other" category. Researchers had to decide whether or not to introduce a new category called "sarcasm", and if so, whether it reflected a main category or a subcategory. Sarcasm could be categorized as affective communication; hence there was no need to create a new main category. Yet, we perceived sarcasm as distinct from other negative emotions (like anger or frustration) and therefore considered creating a new subcategory. However, because there were so few sarcastic utterances in the sample, we finally decided to categorize them in "negative emotions" and defined the appropriate coding rule for sarcastic thought units. This example demonstrates the complexity of the categorization procedure as well as the advantages of a hierarchical category scheme.

We needed several rounds of preliminary coding to adapt and complement the existing categories. Throughout the entire process, which step by step was documented in separate files, coders and researchers discussed the changing category scheme and cross-validated the evolving categories by comparing them to both theory and earlier studies. The process continued until coders had verified that all coding units could be assigned one category code and researchers and coders agreed on the categories. After the last preliminary coding run, the 'other'-categories were eliminated because all communication units had been coded into the existing categories, i.e., no uncodable 'other' units remained. Based on the subcategories, we finally formulated general definitions for the main categories (see *Table 4*).

Table 4: Main Categories – Definitions

1.	**Substantive behavior:** communication that constitutes fundamental negotiation behavior, such as offers, accommodations, logrolling, or disagreement.
2.	**Task-oriented behavior:** communication that promotes or facilitates problem solving and that is not substantive, persuasive, or tactical.
3.	**Persuasive behavior:** communication that supports the claims a negotiator makes.
4.	**Tactical behavior:** communication designed to influence the expectations and actions of the opponent.
5.	**Affective behavior:** communication linked to the expression of feelings about the content, the opponent, or the bargaining situation.
6.	**Private communication:** communication that is not directly related to the negotiation itself.
7.	**Procedural communication:** communication that facilitates the negotiation process.
8.	**Communication protocol (formality):** communication at the beginning and end of a message as well as formal business letter phrases.
9.	**Text-specific units:** communication units particularly linked to electronic (written) communication, e.g., units used to structure the text.

Using these main categories and the respective subcategories (totalling 56 categories), the two coders independently assigned a single code to each unit. After this first main coding round, we calculated Cohen's *kappa* to check intercoder reliability. The basic version of Cohen's *kappa* suggested by Brennan and Prediger (1981) that we used is calculated as follows:

$$\kappa = (\Sigma\ P_{ii} - \Sigma\ P_i\, x\ P_i\ )\ /\ (1 - \Sigma\ P_i\, x\ P_i\ ).$$

$\Sigma\ P_{ii}$ is the observed proportion of agreement, and $\Sigma\ P_i\, x\ P_i$ reflects the chance proportion of agreement (see Holsti (1969)). We found a relatively low coding correspondence of $\kappa = .65$. We attributed this unsatisfactory value to the large number of categories and indicated that the initial version of the coding scheme could be further improved. To determine the conceptual incisiveness of the categories and to identify potential issues for improvement in the coding scheme, we had to systematically compare the preliminary coding results of the two coders. For this purpose, we developed the *intercoder consistency-matrix* and applied it to both the main category- and subcategory-level. For demonstrative purposes, *Table 5* displays study results for the main categories.

Table 5: Results for Intercoder Consistency-Matrix

Coder 1/ Coder 2	Substantive	Task-oriented	Persuasive	Communic. Protocol	Tactical	Procedural	Affective	Private	Text-specific
Substantive	401	51	11	0	18	1	12	0	0
Task-oriented	23	430	44	0	25	2	18	1	1
Persuasive	5	114	85	0	12	0	6	0	0
Communic. Protocol	0	0	0	683	0	0	0	0	0
Tactical	9	61	62	0	86	3	12	0	2
Procedural	1	51	3	0	1	58	5	2	0
Affective	2	40	16	3	1	1	372	3	1
Private	1	14	2	2	0	2	6	121	0
Text-specific	4	10	1	0	0	0	0	1	82
Total	446	771	224	688	143	67	431	128	86
Agreement	**74%**	**48%**	**23%**	**99%**	**29%**	**45%**	**74%**	**77%**	**77%**

The entries that deviate from the lateral axis in the matrix indicate that there were in fact some systematic discrepancies in the two coders' codings. *Table 5* shows that in our study coders disagreed especially on the categories of task-oriented, persuasive, and tactical negotiation behavior. A detailed review of coding discrepancies on the subcategory level suggested to us that some types of behavior had systematically been coded as tactical behavior by one coder, as task-oriented or persuasive by the other, and vice versa. After a systematic discussion of problematic (sub-)categories, we redesigned the category scheme and reformulated the key anchors. A summary of the main changes can be found in the *Appendix*.

Stage 5 – Coding: The final scheme (displayed in *Table 7*) comprises nine main categories, each of which contains up to seven subcategories, resulting in a total of 40 categories. Based on this scheme, we completed the final main coding run, where each coding unit was assigned a main and a subcategory code as shown in the example in *Table 6*.

Table 6: Example for Coding: Assigning Main Category and Subcategory Codes to Units

Unit	Main category	Subcategory
Dear Susaki	Communication protocol	Formal address
Thank you for your quick answer.	Communication protocol	Politeness
I do very much like the idea of a double-win situation.	Task-oriented behavior	Provide information
My suggestion of such a situation is this offer: $ 4.12, 45 days delivery, payment 30 days after delivery and returns full price.	Substantive behavior	Multi-issue offer
I am sure, if you think about it, you will find this a fair offer!	Persuasive behavior	Persuasive arguments
If not, you really know much about fairness!	Affective behavior	Negative emotion
Hope to hear from you! Kind Regards	Communication protocol	Politeness
JD	Communication protocol	Informal Signature

The subsequent check for coding consistency (again using Cohen's *kappa*) yielded an interpretative reliability coefficient of $\kappa = .84$ over all categories. *Kappa* values above .80 are generally considered a very good result (Brett et al. (1998)). This value is relatively high compared to results reported in other studies and can be considered as highly satisfactory (Lombard, Snyder-Duch, and Bracken (2002; 2005)). In view of the large number of main and subcategories in our study, we believe it is even exceptionally high. Intercoder interpretative reliabilities for the main categories range from $\kappa = .93$ to $\kappa = .55$ (see *Table 7*). The values at the lower end of the range on first sight may seem disappointing. However, given that intercoder reliability tends to decrease with the total number of categories, the results are fairly good and can be attributed to the complexity of the concepts (Weingart et al. (2004)). What constitutes a good versus unsatisfactory value for *kappa*, also depends on the complexity of the data as well as the type and newness of the problem. To evaluate the quality of the study, intercoder reliability measures should thus be interpreted in the context of the research problem, the nature of the data, and the details provided on the analysis process. In this study, the varying values indicate that the distinction within the main category is relatively clear-cut for some unambiguous categories (e.g., communication protocol), but it is very difficult to distinguish several less explicit categories (e.g., tactical behavior). Despite a well-developed category scheme and precise rules for coding, the latter types of communication are difficult to code without supporting nonverbal cues (which, e.g., are available in video-taped personal interaction). Therefore, we considered it necessary to repeat context-sensitive reviews of the material, comparisons between this and other studies, and discourse if we were to reach 100% agreement among coders.

Table 7: Final Category Scheme (with Intercoder Reliability Measures)

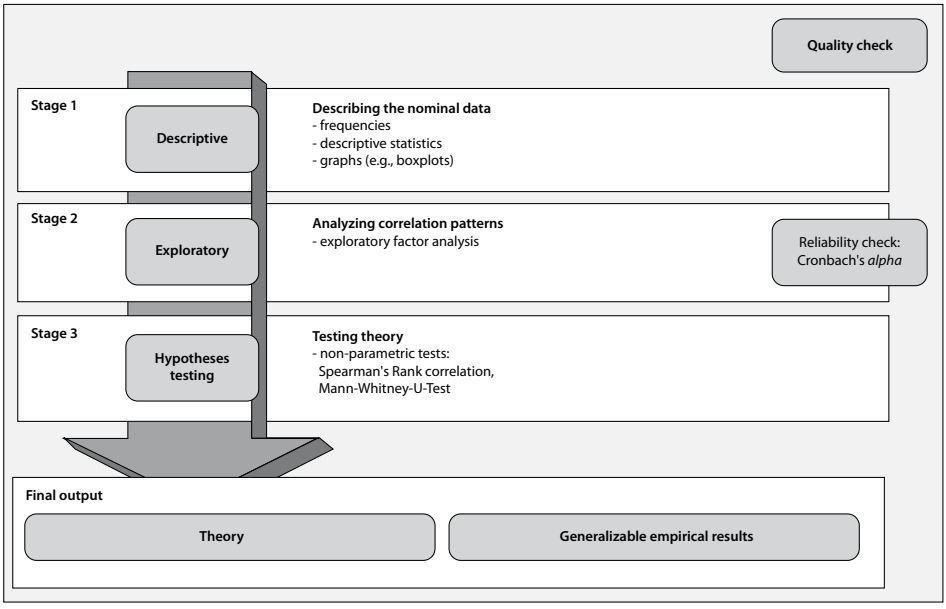
Super-category	Main categories (κ = .84)	Sub-categories
Negotiation-specific categories (CONTENT)	Substantive behavior (κ = .80)	Accommodation
		Rejection
		Log-rolling
		Offer (full-package)
		Offer single issue (price, delivery, payment, return)
	Task-oriented behavior (κ = .75)	Request information / reaction
		Provide information / reaction
		Express understanding
		Reference to relationship
	Persuasive behavior (κ = .69)	Self-supporting statements
		Other-supporting statements
		Persuasive information and argumentation
	Tactical behavior (κ = .55)	Commitment
		Exert pressure
		Promise
		Authority-related tactic
		Alternative suppliers
Relationship categories (PEOPLE)	Affective behavior (κ = .60)	Positive emotions
		Negative emotions
		Apology/regret
		Thanking
	Private communication (κ = .68)	Release of ID
		Other info about person
		Other general info
		Request information/ID
		Emotional reference to extra-role topic
Communication categories (PROCESS)	Procedural communication (κ = .59)	Time-related coordination
		Technical (IT program) coordination
		Negotiation-process coordination
	Communication protocol (κ = .935)	Formal address
		Informal address
		Formal close
		Informal close
		Formal signature
		Informal signature
		Politeness
	Text-specific units (κ = .83)	Redundancy
		Filler
		Text structuring
		Emoticons

To further contribute on a conceptual level, we inspected the identified categories one more time, taking a *Grounded Theory-approach* (Glaser and Strauss (1967); Strauss and Corbin (1990)). Based on the content of the coded data, we condensed the nine main categories into three super-categories: "negotiation-specific" (comprising substantive, task-oriented, persuasive, and tactical behavior), "communication" (including procedural, communication protocol, and text-specific units), and "relationship" (with affective and private communication) categories. These categories reflect the basic dimensions of bargaining identified in the literature: *content* (negotiation-specific), *people* (relationship), and *process* (communication). The additional condensation thus supports theory, while the subcategories further develop knowledge in the field of negotiation research with respect to the specific case of electronic negotiations.

4.3 Quantitative analysis

To solve our research problems (i.e., investigate the particularities of electronic negotiations, describe different negotiation behavior, and identify negotiation patterns that increase the probability of agreement in e-negotiations), we used the three steps displayed in *Figure 2*.

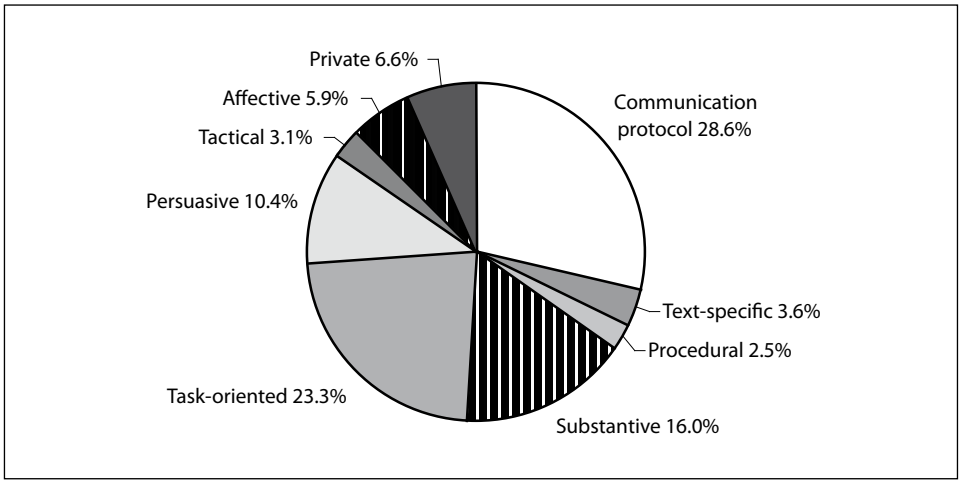
Figure 2: The Quantitative Analysis Process Followed in the Exemplary Study



After the description of the data that reflects the particularities of e-negotiations and different negotiation behavior (stage 1), we ran an exploratory factor analysis to identify patterns of negotiation behavior reflecting negotiation styles (stage 2). Based on the styles we identified, we developed hypotheses on the impact of the various negotiation styles on negotiation outcome (i.e., achieving an agreement or not), consulting literature from negotiation research and related fields. Finally, we tested these *hypotheses* with the coded data derived from the qualitative analysis (stage 3). In the following, we describe the three stages of our quantitative analysis in detail and present our major findings for illustration[4].

Stage 1 – Descriptive analysis: We started with a frequency analysis of the categories we had identified. Results are displayed in *Figure 3*. Applying the super-categories developed earlier, we can conclude from the results that the vast majority of negotiation behavior is *negotiation-specific* (i.e., "content"-focused). Thus, substantive and task-oriented behavior account for almost 40% of all units, while persuasive and tactical behavior (13.5%) are considerably lower. The latter two main categories are comparable in size to the two *relationship* categories, private and affective communication (12.5%) (reflecting the "people"-dimension). One third of all units concerns communication protocol, procedural or text-specific issues, and is thus labeled *communication*-specific (i.e., "process"-related).

Figure 3: Main Categories – Frequencies



From a theoretical perspective, our results suggest that negotiations using electronic support systems are highly content-focused and that they require a lot of process coor-

4 Details on the research framework and hypotheses of the underlying study are presented in Koeszegi, Srnka, and Pesendorfer (2006).

dination, while there is little interpersonal communication when establishing a relationship in e-negotiations. These findings are new and contribute to theoretical knowledge in negotiation research.

Stage 2 – Exploratory analysis: Next, we wished to identify negotiation styles in e-negotiations. Theory would suggest that certain types of the speech acts, which have been identified in the qualitative analysis (providing information, requesting reaction, etc.) tend to be combined following particular patterns that reflect different (e.g., offensive versus defensive) styles of negotiation (Donohue (1981b)). The data developed from the "rich" qualitative material seemed eligible for determining such negotiation styles by identifying correlation patterns between the categories. We calculated frequencies per individual participant for each main and subcategory and ran an exploratory factor analysis. We excluded categories with factor loadings below .500 and allocated the remaining subcategories to three factors extracted. The results and reliability statistics are summarized in *Table 8*.

Table 8: Exploratory Factor Structure – Negotiation Styles

N = 80; main component analysis; Varimax rotation with Kaiser-normalization; KMO-Test: .729					
Bartlett-Test: $\chi^2 = 533.288$, $p < .001$ Total variance explained: 53.90 % Eigenvalue of 4th factor: 1.2	Allocation in Coding Scheme	Cronbach *alpha* (standardized[1])	Offensive Style	Relationship-building Style	Defensive Style
Promise	Tactical	$\alpha = .62$ (stand. $\alpha = .84$)	.846	-.137	.026
Exert pressure	Tactical		.820	-.128	-.027
Negative emotions	Affective		.738	.195	-.008
Persuasive argument	Persuasive		.737	.007	.419
Request information/reaction	Task-oriented		.607	.431	-.008
Reference to relationship	Task-oriented		.573	.094	.315
Commitment	Tactical		.520	-.031	.122
Release of personal information	Private	$\alpha = .78$ (stand. $\alpha = .81$)	.049	.895	-.008
Emotions related to private topic	Private		.076	.834	.031
Request of personal information	Private		-.077	.820	.088
Release of ID	Private		.240	.587	-.061
Positive emoticons	Text-specific		-.117	.535	-.010
Express understanding	Task-oriented	$\alpha = .60$ (stand. $\alpha = .65$)	.232	.053	.722
Reference to alternative	Tactical		.026	-.064	.708
Authority related tactic	Tactical		-.091	.307	.619
Other supporting argument	Persuasive		.107	.027	.579
Logrolling	Substantive		.111	-.206	.534

standardized item alpha is based on covariance and accounts for differences in the variance of items.

We labeled the *first factor* "offensive style". Three out of seven items of this factor can be found in the main category tactical behavior; the remaining items represent offensive behavior falling in other main categories in our coding scheme. The *second factor* comprises units of private communication (except release of other private information) and also the text-specific units positive emoticons. Given that the expression of positive emotions and communication on private topics contribute to relationship-building, we label this factor "relationship-building style". The *third factor* consists of communication behavior of defensive character. Instead of approaching their counterpart offensively, negotiators provide excuses for their resistance to concession making referring to alternatives or to authorities. To express understanding for the counterpart and to support the other's position as well as logrolling additionally characterize what we denoted as "defensive style".

Stage 3 – Hypotheses development and testing: Besides identifying different types of negotiation behavior and more complex styles of interaction in electronic negotiations, our research interest was to determine the impact of the identified negotiation styles on outcome (i.e., agreement or not). To deduce testable hypotheses regarding the impact of offensive, relationship-building, and defensive negotiation styles on agreement probability, we again reviewed theory. Based on the literature review, we formulated the following hypotheses:

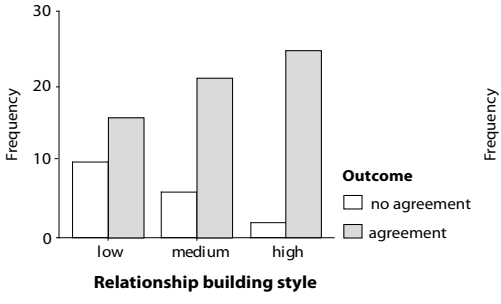
H_1: An *offensive negotiation style* has a *negative impact* on agreement probability.

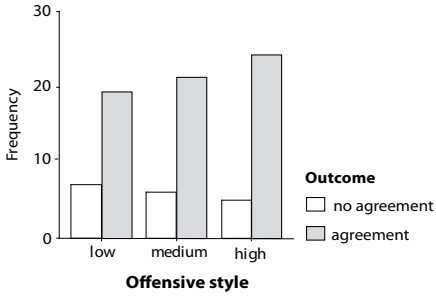
H_2: A *defensive negotiation style* has a *positive impact* on agreement probability.

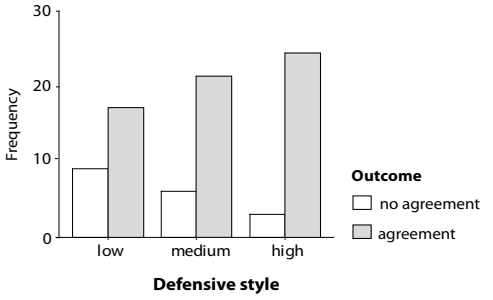
H_3: A *relationship-building negotiation style* has a *positive impact* on agreement probability.

To test the hypotheses, we ran χ^2-tests and Spearman rank-correlations between the categorized factor-values (low-medium-high) of the three negotiation styles and agreement. Results are displayed in *Figure 4.*

Figure 4: Effects of Negotiation Styles on Outcome – Results







χ^2 tests and Spearman correlations

	χ^2	*p*	Spearman *R*	*p*
Relationship building style	7.327	.026	.302	.006
Offensive style	0.538	.764	.082	.470
Defensive style	4.198	.123	.229	.041

We found no relation between offensive behavior and agreement, but we identified a positive correlation between defensive behavior and agreement. As predicted, relationship-building has a significant positive effect on agreement probability: the more subjects exchanged private information or communicated positive emotions, the more likely they were to reach an agreement. These results support hypotheses H_2 and H_3 and reject H_1.

4.4 Discussion and cross-validation

Combining the suggested qualitative procedure of content analysis with the subsequent quantitative analyses, we were able to shed light on the various types of negotiation behavior (e.g., tactical *or* substantive), different negotiation styles, as well as their particular impact on negotiation success. We thereby were able to add to the current body of knowledge in the field as we show in the following.

The quantitative analyses based on the coded data indicate that individuals tend to strategically combine various types of behavior into complex negotiation styles (e.g.: tactical + persuasive + task-oriented behavior = offensive style). These findings lead to significant conceptual conclusions: While the coding scheme developed through content analysis combines units into main categories according to *types of speech acts* (as formative indica-

tors), the factor analysis groups negotiation behavior correlated to each other into *communication styles* (representing underlying constructs). The various types of behavior can be considered as effects (i.e., reflective indicators) of the respective negotiation style. This theoretically relevant contribution would not have been possible if we had not started from the qualitative negotiation messages unitized and coded into the deductively-inductively derived categories.

Cross-validating our findings with earlier studies, we observe impressive congruence. Putnam and Jones (1982), e.g., found very similar defensive and offensive strategies. A third negotiation strategy identified in Putnam et al.'s study of face-to-face negotiations, labeled integrative approach by the authors, comprises items like "other supporting arguments", which in our study loaded on the factor "defensive behavior". In addition to the significant similarities of the behavioral patterns in electronic negotiations to those reported in face-to-face negotiations (e.g., by Putnam and Jones (1982) or Donohue (1981b)), we also find a major difference: the relationship-building dimension. We argue that this negotiation style is a particularity of electronic negotiations, which we were able to identify by systematically applying the qualitative-quantitative research design.

5 Summary and conclusions

In this article, we tie up to the manifold pleas for more discovery-oriented research, while at the same time we do account for the dominant paradigm in the business and management sciences that focuses on theory-testing and deriving statistically significant results. We argue that integrated qualitative-quantitative research is able to contribute to both theory testing and new theoretical findings. Qualitative studies have traditionally been accepted and have always existed in the social sciences as exploratory or triangulation efforts that complement quantitative research in a sequential or parallel way by applying a two studies-design. However, to significantly enrich the body of knowledge, good research needs cross-linkages between qualitative and quantitative investigation (Lilford and Braunholtz (2003); Oppermann (1995); Strauss et al. (1964)) systematically integrating both within one structured process of data analysis.

We highlight the generalization model as a promising research design for discovery. Since integrated approaches so far have only exceptionally been implemented, we provide guidelines to stimulate application of the generalization model in empirical business research. Essentially, we propose a blueprint for a deductive-inductive procedure of content analysis, which on the one hand can provide newly constructed, adapted, or extended theory and on the other hand allows to transform qualitative data into categorical (coded) data for further quantitative analyses. Arguing that the quality of the outcome of this process depends on the structure and systematic procedure researchers apply, we describe the stages of this process and address the important decisions researchers have to make including quality issues.

The most significant contributions of this work comprises the separation of unitization, categorization, and coding as individual stages as well as proposing appropriate quality checks for each of these stages to provide for valid and reliable result. Essentially, we

suggest the intercoder consistency-matrix to guarantee concise category scheme development. Finally, this is the first research to step-by-step demonstrate the implementation of an integrated qualitative-quantitative study. The study presented is of exemplificative character. Several important issues such as cultural factors influencing negotiation behavior (of participants in Taiwan versus Austria) have not been raised here, but were studied and discussed in another article[5]. We hope that this article will encourage other scholars to apply the generalization design in their research in various fields in the business and management sciences!

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Appendix

Major Changes of the Category Scheme during Categorization

- The main category "substantive behavior" initially also included the subcategory "concession", which we later eliminated, because it was indistinguishable from the "accommodation" category. We measured concession behavior by comparing a user's initial offer and the agreed compromise (respectively her or his last offer, if no agreement was reached).
- The coders also encountered serious difficulties in distinguishing the main categories "task-oriented behavior" and "persuasive behavior", because in many cases, it was not possible to clearly differentiate between persuasive arguments and neutral information. Realizing this difficulty after the initial coding, the coders decided to lump some of the "task-oriented behavior" and "persuasive behavior" subcategories together for the next run. We later reviewed this category to distinguish its diverse content and to develop a new category, which better fitted the data and was more comprehensive. After the first run, we also skipped the distinction between information and reaction, because we posited that after the negotiation had started every message actually represented a reaction.
- The subcategory "reference to relationship" was initially coded in the main category "tactical behavior", because we considered reference to a long-lasting relationship as a promise. Later, we found that it had a problem-solving connotation and thus moved it into the category "task-oriented behavior".
- In the beginning, the subcategories "self-supporting statements" and "other-supporting statements" contained all general arguments promoting one's own or the other's position. After the redesign of the categories "task-oriented behavior" and "persuasive behavior", we defined them as containing communication expressing confidence in one's own or the other's competence (especially quality of products or reputation of the company).
- The main category "communication protocol" consists of communication units at the beginning and in the end of a message, which are containing address and salutation as well as business communication phrases like '*Thank you for your message*', or '*I'm looking forward to your reply*'. Originally, these business phrases were part of the affective category (e.g. thanking). Yet, as they were expressions of formality in written communication, the coders considered it more appropriate to code them as communication protocol. Other thanking units were coded in the affective category.
- Communication referring to alternative suppliers/buyers was first coded into the subcategory "exert pressure". Since these behavior, however, were found to constitute a significant negotiation tactic, we decided to create an independent subcategory for them (= reference to best alternative to negotiated agreement = BATNA).
- The main category "affective behavior" first contained ten subcategories. We reduced these subcategories to the most frequently identified emotions and moved "emoticons" into the main category "text-specific units".

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