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Group negotiation: More people more problems?

Examining dyadic and group negotiation.

By

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Abstract

An experimental study of the differences and similarities between dyadic and group negotiation was conducted, comparing the processes and outcomes of dyads and groups on similar negotiation tasks.

The group negotiation of interest in this study is one in which 4 parties, with non-identical preferences attempt to reach a joint decision. The increase in the number of parties (dyads to groups of 4) was conceptualised as an increase in objective task complexity.

The subjects comprised 178 students, most of whom were undergraduate business students at 4 Norwegian institutions. A direct empirical comparison between dyadic and group negotiation revealed that dyads do reach higher quality outcomes than groups, both on economic and social psychological dimensions. Judgement accuracy was not significantly related to economic or social psychological outcomes, in groups or dyads, when the other intermediate variables were held constant. This finding is contrary to the predictions from the negotiation and decision theory.

Our results show that the mechanisms important for reaching integrative agreements differ between dyads and groups. For dyads, procedural structure contributed significantly and positively to high economic outcomes, while problem solving contributed significantly and negatively to economic outcomes, but positively to social psychological outcomes. In groups, however, problem solving led to high economic *and* social psychological outcomes. These findings suggest that different mechanisms lead to integrative agreements in groups and dyads.

The implications of these findings, and the measures used for negotiation research, are discussed further in the text.

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Sometimes it is difficult for me to find myself in my dissertation so I thought I would carve a corner here. How do we acknowledge? I do not often get a chance to thank people publicly, so excuse my excess at this time.

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This dissertation is a product of many different contributors however I alone take responsibility for any misunderstanding the reader may have, or errors contained here within.

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Chapter 1

Introduction

Organisations today are more decentralised and operate in conditions of greater environmental complexity than ever before. Consequently, the delegation of decision making to groups has become a fact of organisational life. Although current management trends proclaim that teams and groups make better decisions which lead to increased organisational effectiveness, research on groups reveals a more complicated story (c.f. Argote et al., 1990; Bettenhausen, 1991; Levine and Moreland 1990; Steiner, 1972 and Yetton, and Bottger, 1982). Groups can achieve higher quality outcomes than individuals, however they often fail to achieve this potential (Steiner, 1972)

One reason for this failure is that groups are made up of individuals who often have different backgrounds and preferences. These differences can lead to conflict and in turn, this conflict if not managed properly can lead to low quality outcomes.

Consequently, the key question for management becomes, how can we aid groups in achieving high quality outcomes? First, the type of task that the group faces must be identified. Many of the decision tasks that groups engage in can be characterised as negotiations (Brett, 1991). A negotiation can be defined as *a type of decision making task in which two or more parties, who have partially differing preferences, attempt to reach a joint agreement*. Negotiations are ubiquitous in organisations occurring frequently in interorganisational relationships, employee relationships, resource allocation and group decision situations.

Given that groups are an integral part of organisational reality, and that they encounter many tasks that can be defined as negotiations, it is necessary to examine the negotiation literature for recommendations regarding how groups can reach high quality outcomes.

In negotiation theory, high quality outcomes are defined by the integrativeness of the agreement. An integrative agreement, originally defined by Mary Parker Follett (1925) and later augmented by Walton and McKersie (1965), is an agreement that reconciles the parties' interests and yield high joint benefit (Pruitt, 1983). The various units of an organisation

(individuals, work groups, departments) usually have differing goals based on the unique nature of their work. Provided that these divergent goals are legitimate, the organisation as a whole will benefit if the different groups are able to find creative ways to reconcile their interests (Pruitt and Carnevale, 1982). The outcome of a negotiation task can be evaluated according to how it is able to reconcile the divergent interests and create high joint benefit.

Integrative agreements are advocated because 1) they are the only way to resolve conflict if all the parties have high aspirations and will not concede, 2) they are more stable than a compromise, 3) they are usually mutually rewarding and tend to strengthen the relationship between the parties, and 4) they contribute to the welfare of the broader community (Pruitt, 1983). In organisations it is essential to foster long term relationships, individual satisfaction, and perceived justice between people and groups, and therefore the integrativeness of an agreement appears to be a good definition of high quality outcomes.

Groups and teams are pivotal components of organisations and many activities that groups engage in have negotiation properties (non-identical interests, interdependency, and decision-making). Unfortunately, much of the negotiation research has focused on dyads rather than groups.

Consequently, empirical investigations that examine the similarities and differences between dyadic and group negotiations are essential so that prescriptions from the dyadic research can be applied to groups.

Theoretical postulations from the negotiation research suggest that increasing the number of parties in a negotiation from a dyad to a group will affect negotiation performance. Further, the theory postulates that increases in the number of parties can cause information overload, increased uncertainty, and stress. In turn, these factors can lead to problems with judgement accuracy, information exchange, co-ordination, and communication patterns (Bazerman et al., 1988 and Kramer, 1991). It is therefore necessary to examine the effect of increases in the number of parties in a negotiation, so that the existing research on dyads can be properly applied to groups.

1.1 Perspective and Specification

In negotiation theory increases in the number of parties is said to lead to increases in complexity and information overload. By using behavioural decision theory we can precisely identify this increase in complexity and examine its effects on outcomes.

Negotiations involve people communicating information about the situation, their interests, and their preferences. When people exchange information they must receive, and interpret this information. However, people are unable to process all the information due to the limits of human information processing and therefore employ simplifying strategies (cf. Simon, 1990). In a negotiation people make individual and joint decisions. The information they use and how they simplify this information has a direct impact on the outcomes in a negotiation. Behavioural decision theory helps identify these simplifying strategies, and contributes to explaining why negotiators often do not reach integrative outcomes.

Behavioural decision theory also provides evidence that the demands of the task affect outcomes. The focus in this literature has been on objective task complexity, which is determined by the objective characteristics of the task. Any increase in information load, increases the objective complexity of the task (Campbell, 1988). In the decision literature, increases in objective task complexity have been associated with lower quality of outcomes.

The objective task complexity (OTC) of a negotiation changes by changing any objective task characteristic that leads to an increase in the information load. In this study OTC is composed of two objective task characteristics: the number of parties with non-identical preferences, and the number of issues in a negotiation. For precision we label increases in OTC associated with increases in the number of parties as, *people complexity* and increases in OTC associated with the number of issues, as *issue complexity*. Objective task complexity includes both people complexity and issue complexity.

A negotiation is defined as an interdependent task and therefore the addition of other parties with their own interests increases the number of interests that must be reconciled. By conceptualising an increase in the number of parties in a negotiation as an increase in objective task complexity, we can derive clear predictions about the relationship between the number of parties and the outcomes.

Behavioural decision research includes numerous studies examining the impact of complexity on decision tasks. The basic conclusion from this research is that due to limited information processing capacity, humans use cognitive shortcuts - heuristics, when making complicated decisions. These simplifying strategies often lead people to make inaccurate judgements.

A number of these judgement errors have been identified in negotiations (cf. Bazerman and Neale, 1983; and Thompson and Hastie, 1990b), and these biases have been linked with lower negotiation outcomes (Arunachalam and Dilla, 1995; and Thompson, 1991). From the decision literature we know that increases in OTC can lead to increases in judgement errors (cf. Hogarth, 1987 and Payne et al., 1993). We can conclude that as the objective task complexity of the negotiation increases, quality outcomes will decrease (Bazerman et al. 1988, and Kramer, 1991).

We have conceptualised the difference between dyads and groups as an increase in OTC, specifically people complexity, however we also need to specify the *type* of group negotiation we will be investigating. In organisations there are several types of group negotiations that could emerge. For example: negotiations involving a third party; two groups or two teams negotiating together; groups containing members with identical preferences: and negotiations where there are possibilities of coalition formation. However, in this study we want to investigate group negotiations *which can be directly compared* to dyadic negotiations. By directly comparing dyads and groups along the same task dimensions, decision aids from the dyadic research that also work for groups can be identified. We delimit our investigation to group negotiations where all parties have non-identical preferences and stable coalitions are not possible.

We have defined a negotiation as a type of decision task and have identified that increases in the number of parties (people complexity) and issues (issue complexity) increase the objective task complexity. The effects of increases in objective task complexity on decision processes and outcomes have been studied extensively (c.f. Payne, et al. 1993). We have also specified the type of group negotiation we will investigate. Decision theory will be used to examine the effects of increases in the number of parties involved in the negotiation, thus providing both theoretical and empirical indications for the effects of complexity on negotiation outcomes. In addition to manipulating people complexity, we are also interested in manipulating issue complexity. By changing the objective task characteristic on two dimensions (people and

issue) we will be able to compare whether some objective task characteristics are more important than others in a negotiation.

1.2 Research questions

Group negotiation is a critical and common activity in organisations, and negotiation theory can help us manage these activities so that high quality outcomes can be achieved. Unfortunately, there is a paucity of research on group negotiations and virtually no studies exist that directly compare group and dyadic negotiations.

Recent research on group negotiation suggests that integrative agreements may be more difficult to reach in a group than in a dyad (Mannix et al. 1989, Thompson et al. 1988, and Weingart et al. 1993). The assumption is that increases in information processing, necessity for social decision rules, and intricate interpersonal processes make group negotiations more difficult than dyadic negotiation.

The complexity of the task affects individual information processing by limiting the information considered and processed. As the negotiation becomes more complex people increasingly use simplifying strategies. Whether these simplifying strategies are effective or not, depends on how the strategy matches the task. In the negotiation literature we note that people often choose sub-optimal decision strategies or heuristics such as the fixed pie bias, which lead to less integrative agreements.

As stated in section 1.1, our main objective is to examine the similarities and differences between dyadic and group negotiations. We have conceptualised the differences between dyads and groups in terms of objective task complexity (specifically, people complexity), and have used behavioural decision theory to understand the effects of increases in the number of parties on negotiations. In addition to increases in objective task complexity determined by the number of parties, we are also interested in increases in objective task complexity determined by the number of issues (issue complexity). Issue complexity, however, is of secondary interest in our investigation and therefore in figure 1 it has been placed in brackets.

Based on our decision theory perspective, the two intermediate variables of most interest in our investigation are judgement accuracy and information exchange. These concepts are

linked to the decision and negotiation research, as well as to integrative outcomes. Our objectives can be achieved by answering the following research questions:

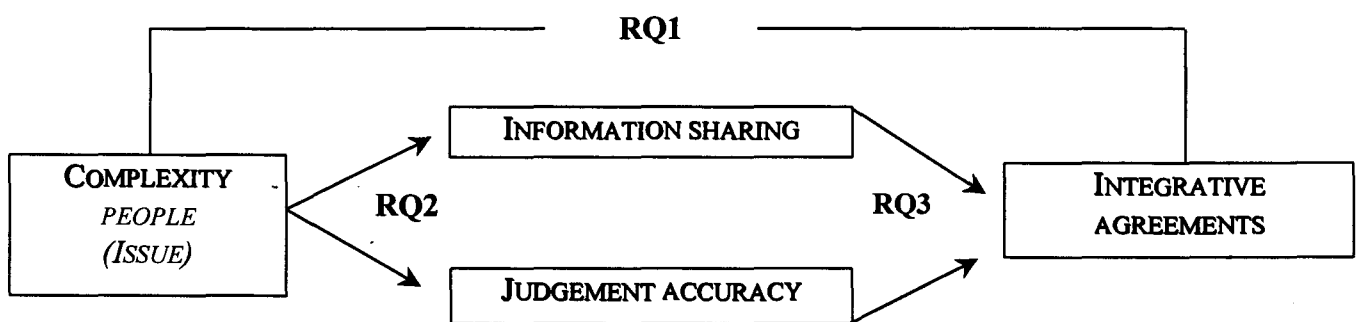
RQ1: Do increases in objective task complexity cause decreases in the quality of outcomes in a negotiation?

RQ2: Do increases in objective task complexity affect the variables that emerge in the negotiation process?

RQ3: Do the intermediate variables that lead to high quality outcomes differ between groups and dyads?

Our simplified conceptual model is presented in figure 1. Our research questions centre on the OTC determined by people complexity and issue complexity, on judgement accuracy, information exchange, and integrative agreements.

Figure 1 Simplified conceptual model



Within the behavioural decision perspective, two intermediate variables, the exchange of priority information and judgement accuracy, have been linked to integrative agreements (cf. Pruitt, 1983; Thomson, 1991; and Walton and McKersie, 1965). These variables will be our main focus as they link OTC and integrative outcomes. In addition, other intermediate variables not directly related to a decision theory perspective will be included in our analysis so that differences between dyadic and group negotiation can be detected. These other variables will be discussed in Chapter 2.

1.3 Significance of the topic

We argue that research on group negotiation is of interest to both practitioners and researchers. For practitioners, a better understanding of how groups and teams in

organisations function is essential and many group activities mixed-motive. Negotiation research can help practitioners determine which type of decision aids will most improve group performance, and how to measure high quality outcomes.

In negotiation research, more studies are needed on group negotiation, and in particular, on direct comparisons between dyadic and group negotiations. In order to utilise the dyadic negotiation research we need to identify the similarities and differences between dyadic and group negotiation. Unfortunately, there are no studies that directly compare dyadic and group negotiation on similar tasks.

1.4 Structure of the dissertation

The dissertation contains 10 chapters. Chapter 1 is the introductory chapter and Chapter 2 provides the theoretical and empirical background for our research questions. In Chapter 2 an argument for the necessity of studying the differences between dyadic and group negotiations is developed. The logic of the chapter is that since decision making is known to be influenced by increases in complexity, and negotiation can be defined as a type of decision making task, then we can conclude that increases in complexity will affect negotiations. We isolate the primary intermediate variables, which are consistent with our approach, that affect outcomes in a negotiation and link complexity to these constructs. Our main argument in this chapter is that the effect of increases in the number of people on the processes and outcomes in negotiations must be directly investigated so that empirical support can be provided for the theoretical postulations. By discovering whether there are empirical differences between dyads and groups, we can begin to determine the applicability for groups of previous negotiation research which has concentrated on dyads. Chapter 3 introduces our research problem, our conceptual model, and our hypotheses and Chapter 4 outlines our research design. Chapters 5 & 6 provide clarification regarding the development of the negotiation task, the operationalisations of the constructs, and the procedure. Our results are described in Chapter 7 & 8. In Chapter 7 we examine the quality of the data and in Chapter 8 we present the findings from our hypotheses testing. The discussion of the results of our hypothesis testing is contained in Chapters 9, and our overall conclusions and evaluations of the study can be found in Chapter 10.

Chapter 2

LITERATURE REVIEW

In this chapter it will be argued that the effect of people complexity on the processes and outcomes in negotiations must be directly investigated. Theoretical reasons for differences between groups and dyads are presented and a lack of empirical evidence to support these postulations is identified. We will argue that simply examining groups, without a direct comparison to dyads, does not instruct us how to use the wealth of research on dyads. We review the literature to isolate key areas to investigate and to develop theoretical arguments about the differences between groups and dyads.

The chapter begins by defining and delimiting the type of negotiation we are interested in investigating (2.1) and defining complexity as it relates to increases in the number of parties involved in the negotiation (2.2). Based on our definition of negotiation and complexity we will outline our theoretical approach to the study of negotiations (2.3). High quality negotiation outcomes will be defined in section (2.4). In section (2.5) we present findings from the dyadic negotiation research with a special emphasis on isolating processes that are related to our decision perspective. Section (2.6) explores how the relationships found in the dyadic negotiation research are similar or different from those postulated or found in group negotiations. In section (2.7) other research related to either complexity or decision making is examined. The summary (2.8) concludes that there is lack of empirical evidence the effects of people complexity must be empirically investigated. In Chapter 3 these arguments will be developed into hypotheses. Figure 2 outlines the logic of the chapter.

Figure 2 Outline of literature review based on the conceptual model

Defining negotiation	2.1
Defining complexity	2.2
Complexity and negotiations: Theoretical approach	2.3
Important outcomes	2.4
What we know about dyadic negotiation: processes that are important	2.5
How might the addition of more people affect these processes and outcomes?	2.6
What other research might help us understand increases in task complexity?	2.7
Summary	2.8

2.1 Defining and delimiting negotiations

Depending on the most salient attributes of the situation, the term negotiation can be used to describe a conflict resolution technique or a decision making task. These descriptions are not mutually exclusive, but interrelated. All negotiations that have a focus on conflict resolution contain elements of decision making and all negotiations that have a focus on decision making involve some conflict. However, if we regard negotiation as primarily a method for resolving or settling a conflict the emphasis is on the conflict that exists between parties. Negotiation is understood in relation to other conflict resolution techniques, such as the use of power, or third party intervention. If, on the other hand, negotiation is conceptualised as a decision

making task the emphasis is on decision making and the term negotiation describes the type of task. We can then examine negotiation in comparison to other group decision making tasks.

In our investigation we conceptualise negotiation as, *a type of decision making task in which two or more parties, who have partially differing preferences, attempt to reach a joint agreement*. Negotiation differs from other decision making tasks in that it is mixed motive (McGrath, 1984). Mixed motive refers to participants being motivated to achieve their own interests and at the same time co-operate with the other party so that a joint agreement can be reached. Negotiation is a special type of *decision making task* where the parties are *interdependent* for reaching a joint decision and have *partially conflicting interests*. These conflicting interests refer to ends rather than means.

Negotiation tasks can be found between nations, organisations, groups, and people. Our focus is negotiations found within organisations.

We have now defined negotiation as a type of decision making task that occurs in an organisational context. In the next section we will define our group negotiation in terms of complexity.

2.2 Group negotiation: Task complexity

Negotiation is a decision task that requires parties who have non-identical interests to reach joint decisions across multiple issues. Increases in the number of parties with non-identical interests (dyads to groups) can increase the objective and the subjective task complexity of the negotiation. The subjective interpretation of task complexity can affect the processes and outcomes of negotiation, however objective task complexity was deemed essential to study first for the following reasons:

1. The effect of increases in the number of parties, which is related to objective characteristics of the task, is central to our research.
2. Our interest is in group level phenomenon and objective complexity is a group level concept.
3. The need to establish the task's effects on the negotiation process and outcome.

If we establish the effects of objective task complexity, then subjective complexity can be investigated based on these findings. In this section the type of group negotiation is defined and dimensions of objective task complexity (OTC) that are of interest in our investigation will be presented.

Before defining OTC it is necessary we specify the type of group negotiation we are studying. The group negotiation of interest in this dissertation is defined as involving 3 or more parties with non-identical interests.

Using an objective task complexity framework we can classify our type of group negotiation and link it with the decision research. Campbell (1988) contends that any objective task characteristic that involves an increase in information diversity, rate of information change, or increases the individual's information processing load contributes to complexity. Objective task complexity, in decision research, has been defined in terms of the number of alternatives, the number of attributes associated with each alternative, and time pressure (Payne et al., 1993).

The objective task complexity of the negotiation can be described by the number of parties with non-identical preferences, the number of issues, the number of alternatives, the number of possible agreements, time pressure and the degree of difference in the parties' preference structure. In this dissertation the main interest is to study the difference between dyadic and group negotiation and therefore we examine increases in task complexity by increasing the number of parties with non-identical preferences, and secondly by increasing the number of issues. We argue that information load will increase by the addition of parties with non-identical preferences.

The two components of objective task complexity that will be investigated are people complexity, defined by the number of parties with non-identical preferences involved in the negotiation and issue complexity, defined by the number of issues in the negotiation. Examining issue complexity not associated with different parties' interests gives us more specific insight into how different dimensions of complexity affect a negotiation.

2.3 Understanding complexity and negotiations: Theoretical approach

Research on negotiation has included economic, structural, individual differences, communication, and information processing approaches (Carroll and Payne, 1991). We have defined negotiation as a joint decision making task and our variable of interest is objective task complexity. Based on these definitions an information processing perspective is the most theoretically relevant approach to investigate the relationship between complexity and negotiation outcomes. In section (2.3.1) an explanation of why this approach is most appropriate and a description of what this approach comprises will be given. Within the information processing approach we identify behavioural decision theory (BDT) as providing us with the most useful concepts and research for identifying the effects of increases in people complexity on the processes and outcomes in a negotiation. This theory and the relevant research related to negotiations are presented in section (2.3.2). Our conclusion is that BDT is the appropriate theory to use to understand the effects of increases in people complexity.

2.3.1 Information processing approach

The information processing approach has been used extensively in the negotiation, decision making and problem solving literature (Carroll and Payne, 1991). This approach integrates and augments research from several traditions: economics, structural differences, individual differences, and communication (Carroll and Payne, 1991). All that transpires in a negotiation must be cognitively processed by the negotiators present. As stated in Chapter 1, negotiations involve people communicating information about the situation, their interests, and their preferences. In addition, the negotiation focuses on negotiators making individual and joint decisions. What is crucial is the way that the information is exchanged and processed. By taking an information processing approach we can develop concrete recommendations on how to negotiators can improve the information processing that takes place in a negotiation.

The information processing approach includes theories which examine the mental steps that occur between a stimulus and a response, and presumes that that these mental operations can be specified and divided into a sequential string: encoding, storing, and retrieving (Fiske and Taylor, 1991). Research using this approach includes multiple levels, for example, the

information processing that occurs in organisations or groups or at the individual level. In addition, the approach emphasises the task that is faced by the person or group and the limits of human attention, processing, and memory. In the literature the information processing approach has been labelled a theory (Thompson et al., 1995), a model (O'Reilly, 1990), and a paradigm (Simon, 1990). For the present study information processing will be defined as a general approach which includes different theories.

In a negotiation people make individual and joint decisions, and the information they use is critical to the outcome of the negotiation, how they simplify this information has direct implications for the outcomes in a negotiation. The information processing approach provides the conceptual background for understanding the decisions that take place in the negotiation.

2.3.2 Behavioural Decision Theory

One of the strongest theories within the information processing perspective is behavioural decision theory (BDT). This theory originated as a response to the economic normative model of decision making which postulated that individuals make rational decisions. Individual rational decision making in the organisational environment consists of six stages: defining the problem, identifying the criteria, weighting the criteria, generating the alternatives, rating each alternative on each criteria, and computing the optimal decision (Bazerman, 1986). In the economist's model the actor is assumed to be rational which then presumes the following about the six criteria: the problem is perfectly defined, the relevant alternatives are all known, all the criteria are identified, all the criteria are accurately weighted according to the actor's goals, the alternatives are accurately assessed on each criterion, and the accurate choice of the alternative with the highest value occurs (Friedman, 1957, referred to in Bazerman, 1986).

BDT originated in the 1950's with Herbert Simon. Simon developed the theory of bounded rationality and argued that humans are deficient in both the knowledge and computational skills that are necessary to make rational decisions. Bounded rationality describes how people are unable to acquire and process all the information available in the environment that would ensure an economically rational outcome. Behavioural decision theory emerged as a response to the economic model and sought to describe the limits of human decision behaviour.

Behavioural decision theory evolved with a specific focus on decision making tasks and the heuristics associated with judgement and choice. The research has concentrated on studying which strategies people use to make decisions, and the implications of these strategies on decision outcomes. Simon suggested general strategies that people use to lessen the cognitive requirements of decision making. Two of these strategies are: that people only consider part of the problem, and that people do not seek the optimal solution but the one that corresponds to their aspiration level. The conclusion is that people do not optimise, but instead satisfice meaning people seek a satisfactory alternative. In Simon's theory reasonable decision makers weigh the costs of information processing and try to reduce these costs while at the same time maintaining purposeful behaviour. Simon emphasised that human computational capabilities interact with the complexity of task environments, and thus, give rise to bounded rationality (Payne et al., 1992).

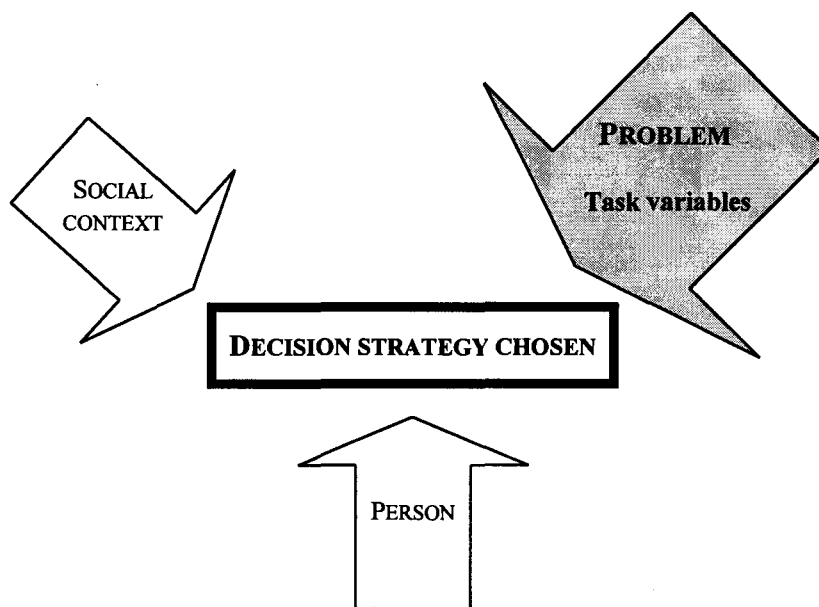
Commensurate with bounded rationality decision researchers continued to focus on ways in which actual human decision behaviour deviates from the predictions of the rational choice model. The more recent research is not only connected with economics but is interdisciplinary in nature, using concepts and models from economics, social and cognitive psychology, statistics and other related fields (Payne et al., 1992). Behavioural decision theory (BDT) seeks to understand the constructive nature of preferences and beliefs and the contingent use of multiple approaches for solving decision problems (Payne et al. 1992). BDT maintains its link to the economic theory but its goal is to *describe* how humans deviate from the economic ideal.

Humans cannot process all the information available, so strategies for simplifying the world are quintessential for human survival (Nisbett and Ross, 1980). These simplifying strategies are called heuristics. Hogarth (1987) concludes that most of our simplifying strategies result from *task variables* such as, amount of information, time pressure, sequential versus intact data presentation, inconsistent or missing values in information, and an unwillingness to expend mental effort. This leads to individuals adopting processing strategies to reduce mental effort. In the behavioural decision literature the effects of task complexity on individual decision making have been extensively investigated (cf. Payne et al., 1993). The findings suggest that individuals change their decision strategies to manage the increases in

decision complexity and this can lead to strategies that produce sub-optimal outcomes (Payne et al., 1993).

The decision strategy an individual uses is said to be contingent on three sets of factors present in the decision situation: characteristics of the problem, the person, and the social context. From the research we know that human decision making is contingent on the structures of the problem and therefore we can assume that this is directly relevant for our investigation into dyadic and group negotiations. Figure 3, adapted from Payne et al. (1993), presents these three categories of elements. The category we are interested in investigating is the problem, and more specifically the task variables of the problem. We have argued that in negotiation as the number of people, with different interests, increases so does the objective task complexity.

Figure 3 Contingent strategy selection



The behavioural decision research clearly illustrates that humans do not process information according to predictions of rational choice theories. It also illustrates, through numerous empirical investigations, how complexity in the decision problem *can lead* to lower quality decision outcomes dependent on the simplifying strategies individuals use (cf. Hogarth, 1987 for an overview).

Behavioural decision theory is not limited to explaining individual decision behaviour, more recently this theory has been applied to groups and findings suggest that groups exhibit similar biases to individuals (cf. Argote et al., 1986 and Argote et al., 1990).

BDT provides the theoretical explanations regarding the effect of objective task complexity on the processes and outcomes of a decision task. We know that people change their decision strategies depending on the objective complexity of the task. Sometimes these strategies lead to sub-optimal outcomes. Negotiation is a decision task where people often use simplifying strategies that lead to sub-optimal outcomes.

The existing negotiation literature incorporates many of the concepts developed in the behavioural decision research and illustrates how biases, or simplifying strategies, are used in a negotiation task (c.f. Bazerman and Carroll, 1987; Carroll, Bazerman, and Maury, 1988; Carroll and Payne, 1991; Neale and Bazerman, 1992; and Neale and Northcraft, 1991). The decision heuristics found in negotiation are both similar to biases found in other decision tasks and unique to the negotiation task. The task characteristics and the context characteristics have been shown to affect decision behaviour in negotiations.

In table 1, an overview of the biases, or simplifying strategies examined in the behavioural decision research, which have also been found in the negotiation research.

Table 1 Negotiation research that has found the presence of BDT heuristics

AUTHORS	BIASES
1. Bazerman, Magliossi, and Neale (1985) 2. Neale and Bazerman (1985) 3. Neale, Huber and Northcraft (1987)	FRAMING Inappropriately affected by the positive or negative frame which risks are viewed.
4. Huber and Neale (1986) 5. Northcraft and Neale (1986) 6. White et al. (1994)	ANCHORING Anchor their number estimates in negotiations on irrelevant information
7. Bazerman and Neale (1982) 8. Neale and Bazerman (1985)	OVERCONFIDENT about the likelihood of attaining outcomes that favour themselves.
9. Neale and Bazerman (1985) 10. Northcraft and Neale (1986)	ESCALATE COMMITMENT to a previously selected course of action when it is no longer the most, reasonable alternative.
11. Bazerman and Carroll (1987) 12. Samuelson and Bazerman (1985)	OVERLOOK VALUABLE INFORMATION by not considering the other opponent's cognitive perspective.

In addition to these judgement errors that are common to other decision domains and negotiation settings, heuristics and biases particular to a negotiation have been investigated. The research on these biases is listed in table 2.

Table 2 Biases specific to negotiations

Authors	Biases
1. Arunachalam and Dilla (1995) 2. Bazerman et al. (1985) 3. Neale and Northcraft (1990) 4. Pinkley et al. (1995) 5. Thompson and Hastie (1990a) 6. Thompson (1991)	Fixed pie Assume negotiation tasks are fixed sum and therefore miss opportunities for mutually beneficial trade-offs between parties.
7. Arunachalam and Dilla (1995) 8. Thompson and Hastie (1990a)	Incompatibility error Do not recognise when other party has the same preferences within an issue.

The fixed pie error occurs when negotiators believe that the other party has the same priority ordering of the issues (i.e. a negotiator believes that the issues that are most important for them are also most important for the other party) and want the opposite of what they want. The incompatibility error occurs when negotiators do not recognise that they have similar preferences for alternatives within an issue. We will discuss these two biases in more detail in section 2.5 when we review processes that are important for negotiation outcomes.

The negotiation research illustrates that the behavioural decision theory can be used to understand negotiation processes and outcomes. The biases found in the negotiations are linked to lower quality outcomes in a negotiation. It appears that the simplifying strategies negotiators use inhibit obtaining high quality outcomes. In the next section we will clarify and define what are high quality outcomes in a negotiation.

In this section we have argued that the best theoretical frame for the study of negotiation, when defined as a type of decision making task, is the information processing approach using BDT. Behavioural decision theory provides us with the theoretical frame to understand how decision outcomes differ from rational outcomes. This approach and theory have been used extensively in the study of negotiations. In addition, BDT provides the theoretical

background for predicting how changes in the task structure will affect decision strategies and outcomes. In the next section we will define high quality outcomes in a negotiation.

2.4 Important outcomes in a negotiation

In the negotiation literature a high quality negotiated outcome is often equated with an integrative solution (c.f. Fisher et al. 1991; Pruitt, 1983; and Thompson, 1991). The concept of integrative agreements was originally developed by Mary Parker Follet in the 1920's (Follet, 1925). When parties have differing preferences Follet argued that integrative solutions are possible to find by identifying the parties' underlying interests and reconciling them. An agreement is completely integrative when all parties have been able to satisfy their interests. The degree to which an agreement is integrative has been used extensively in the negotiation literature to describe high quality outcomes (Pruitt and Carnevale, 1982 and Thompsom, 1990). Integrative agreements have been defined as those agreements that reconcile the parties' interests and create high joint benefit (Pruit, 1983).

Integrative agreements are highly recommended because they are more stable than compromises, tend to strengthen relationships between the parties, and contribute to the broader welfare of the community (Follet, 1925 and Pruit, 1983). Compromises are those agreements which are reached by parties conceding along a salient conflict dimension of the negotiation to some middle ground (Follet, 1925). Integrative agreements are considered superior to compromises and might be the only way to resolve the situation if all the parties have high aspirations and will not concede. In organisations where high *joint benefit* among members is critical for success it is easy to argue that an integrative agreement measure a high quality outcome.

Although there is uniformity in using integrative to describe high quality outcomes in negotiation, there is confusion and discrepancy with the general use and measurement of this construct. Integrative often refers to several aspects of the negotiation situation at the same time. For the purposes of clarity we will state how we will use the term integrative in this dissertation and the dimensions of this construct. A more detailed discussion of the measurement issues of integrative agreements will be undertaken in Chapter 6.

The term integrative has been used to refer to the type of task, the type of negotiation strategy, the type of process, and the type of outcome. The overuse of the term integrative has led to imprecision and confusion in the literature. Integrative, as it refers to the structure of the task (Raiffa, 1982), indicates whether an integrative solution is possible, i.e. if it is possible to reconcile the interests of the parties. Other negotiation theorists discuss integrative strategies, which include using information and communication to reach integrative agreements. Integrative bargaining (Walton and McKersie, 1965; Fisher et al, 1991) refers to the behaviours in the negotiation process. The overuse of this construct to apply to several elements of the negotiation can lead to tautological explanations. For example, people reach integrative agreements by engaging in integrative bargaining. In this dissertation, the term integrative will only be used for agreements reached in the negotiation which maximise the joint benefit of the negotiators (Thompson, et al. 1988). By using the integrative construct exclusively for outcomes (agreements) that produce high joint benefit, more clarity and precision can be introduced in this study.

What are the primary dimensions of an integrative agreement? An integrative agreement can be defined by the joint benefit it provides and the degree to which *all* parties benefit. The degree of benefit can be defined by economic and psychological criteria. The economic dimension is well established in the negotiation literature (see Thomson, 1990 and Tripp and Sondak, 1992), however, the economic dimension alone does not fully represent the construct of integrativeness. For example, parties could reconcile their interests economically but not recognise the economic benefits. The failure of the parties to psychologically interpret the outcome as reconciling interests would limit the degree to which the agreement could be classified as integrative. Both the objective and subjective dimension of an integrative agreement need to be considered.

The psychological aspect of joint benefit is seldom used to define integrative agreements. Recently Pinkley et al. (1995) included psychological dimensions in their evaluation of the quality of the agreement. Few studies have attempted to examine both the psychological and economic dimensions of joint benefit. We argue that both these dimensions are necessary for two reasons: one to develop better operationalisations of the construct integrativeness and to further establish the relationship between psychological and economic outcomes. Often in

negotiations outside the laboratory, the economic dimensions are difficult to measure and therefore it is important to include the psychological dimension and establish its relationship with the economic dimension.

Thus far we have identified both objective (economic) and subjective (psychological perceptions) of an integrative agreement but one additional point needs to be made regarding the degree to which the benefit is shared. This dimension highlights the fact that an integrative agreement requires that all parties benefit (Pruitt and Carnevale, 1982).

At the conceptual level it is important to emphasise the critical components of an integrative agreement: reconciling interests and maximising joint benefit along both the economic and the psychological dimensions. The quality of outcomes can range from not reconciling interests at all and low joint benefit (low quality) to a completely integrative agreement reconciling interests and maximising joint benefit (high quality). In the next section we will review the process variables that have been linked to integrative agreements.

2.5 Dyadic negotiation research: Determinants of integrative agreements

In this section we identify constructs that are related to integrative agreements. Although many elements within a negotiation have potential for influencing the outcomes, our focus will be on those which possess both empirical links to integrative agreements, and theoretical links to the information processing and BDT approach to negotiations.

Negotiation is conceptualised as having three parts: input, process, and outcome. In this section we will identify the elements within the process that are related to outcomes. In this dissertation the negotiation process includes elements that precede the outcome, which we will label our intermediate variables. These elements can be activities such as information sharing or the individual decision strategies used in the negotiation. Within the process the antecedents of integrative agreements emerge and need to be identified. Within the process information exchange, judgement accuracy, procedural structure and problem solving have been identified as being related to both integrative agreements and to our theoretical approach. As stated in the previous section our theoretical approach was determined by our interest in increases in complexity and our conceptualisation of a negotiation as a decision making task.

Before presenting these constructs a general observation regarding the negotiation research methods needs to be made.

The tasks used to investigate negotiations have limited the methods parties can employ to achieve integrative agreements and therefore many of the processes identified are tied to this particular type of task. To clarify this point we will begin this section with a presentation of Pruitt's (1983) 5 methods for achieving integrative agreements and identify logrolling as the method that most investigated in the dyadic negotiation literature. Since most of the research only uses tasks where integrative agreements can be obtained through logrolling, the processes linked with integrative agreements will be limited. After this clarification is presented we will review the central processes within the dyadic negotiation research and discuss their usefulness for understanding group negotiations.

Pruitt (1983) distinguishes 5 methods for achieving integrative agreements. Integrative agreements reconcile interests yet the specific type of task the parties face will determine which methods are available.

Expanding the pie. This method requires the parties to obtain more resources and bring them into the negotiation. For this type of situation information requirements are low, and parties do not need to know about the other person's interest. This method assumes there really are resource shortages initially. Information exchange is not as important for a task where expanding the pie is possible to do.

Non-specific compensation. With this method one party gets what she wants and the other party is repaid in another way. Two kinds of information are needed for this method: information about what is valuable to the other party, and information about how much the other party is sacrificing by making this concession. With this type of method information exchange is more important than when one can expand the pie.

Cost cutting. Cost cutting involves specific compensation so that the party who concedes receives something in return that satisfies exactly the values thwarted. In this situation the compensation covers the precise cost incurred. Information is needed about the nature of one of the parties' costs. This information is deeper than knowledge of the other party's priorities.

One needs to know about values, aspirations and standards underlying the party's overt position.

Bridging. With this method neither party receives their initial demands but instead a new option is created that satisfies the most important interests underlying the demands. Pruitt (1983) states that bridging usually involves reformulation of the issues based on an examination of the underlying interests and priorities of both parties. Information about the parties' interests and their priorities among these interests is necessary. Parties will drop low priority interests in their attempt to reach a solution.

Logrolling. Logrolling has received the most research in the negotiation literature since this method is easily studied in an experimental situation. Logrolling is similar to bridging except with logrolling parties trade low priority issues rather than interests. Logrolling is also a variant of non-specific compensation in which both parties are compensated for making concessions desired by the other. The information required about the two parties is about their priorities so that concessions can be exchanged.

The different techniques that can be used to achieve an integrative agreement: creating more resources, non-specific compensation, cost cutting, bridging and logrolling, require differing amounts of information exchange and creativity. Much of the research in negotiations has centred on tasks with integrative potential that is achieved through logrolling (the fifth method presented above). This implies that in order to reach an integrative agreement information exchange about priorities is needed whereas creative solutions such as expanding the pie or bridging are not incorporated. The design of these tasks allows for researchers to investigate *the factors related to integrative agreements achieved by logrolling*, however it should be noted the logrolling technique is only 1 of 5 possible alternatives. The implication is that some activities and decision strategies important for the other techniques, such as expanding the pie, could differ. The research most pertinent to our investigation has used negotiation tasks in which information requirements and solution possibilities are restricted to the trading off of priorities, logrolling tasks.

The research presented below uses logrolling tasks to identify elements in the process that are related to integrative outcomes. These findings therefore may be limited to these particular types of tasks.

In the next sections the central constructs and variables related to both integrative agreements and complexity, from the dyadic negotiation research will be reviewed.

2.5.1 Central constructs related to integrative agreements

In negotiation theory several constructs have been associated with integrative agreements, central among these are information exchange and judgement accuracy. The proposed relationship between judgement accuracy and information exchange can be stated in the following manner:

- Information exchange can lead to parties forming accurate judgements about the other party's preference structure and the task, and
- Accurate judgements can influence the information exchange and the information processing that occurs in a negotiation.

Information exchange and judgement accuracy are related to one another, however the exact nature of this relationship requires further research. At this point we note that there is a general relationship: information exchange can influence judgement accuracy and judgement accuracy can influence information exchange. In turn, both information exchange and judgement accuracy can influence outcomes in negotiations.

2.5.1.1 Information exchange

Information is a critical resource in negotiations and can contribute to achieving integrative agreements (Walton and McKersie, 1965). Information exchange is necessary so that the situation can be defined, alternatives generated and the possible consequences of these alternative explored. (Walton and McKersie, 1965). The type of information exchanged often sets the parameters for the quality of agreements that can be obtained (Pruitt and Carnevale, 1982). As stated in the beginning of section 2.5 the different techniques for achieving

integrative agreements require varying amounts and types of information (Pruitt, 1983). For example, for the logrolling technique information about priorities is most important. Information sharing can facilitate integrative agreements by giving parties a better understanding of one another in terms of their interests and their priorities, by opening the negotiation up to alternative solutions, and perhaps by dispelling some biases about others' intentions. The role of information exchange is to provide a negotiator with better insight into the other's preferences, and priorities and can contribute to the effectiveness of using a problem solving approach.

In the empirical studies below the effects of information exchange varied depending on the type of information exchanged, the amount of information exchanged, individual differences, and how the researchers manipulated the information exchange. The overall conclusion is that there is empirical support that information exchange *can* contribute both to judgement accuracy, and integrative agreements.

Type of information exchanged

The type of information exchanged that has been studied is related to the priorities and preferences of the negotiators. This type of information exchange takes two forms: explicit and implicit (Pruitt and Carnevale, 1982). Explicit information sharing occurs when negotiators tell the other parties what their interests and priorities are. This type of information exchange has been weakly although positively correlated with insight and joint benefit (Pruitt and Lewis, 1975, and Schulz and Pruitt, 1978). Explicit information sharing is best when three conditions exist: negotiators are high in cognitive complexity, and they both have a co-operative orientation, and they have low accountability to a constituency (Pruitt and Carnevale, 1982). This type of information sharing can be negative if parties disagree about basic values and can be risky because the one party can use the information against the other party. In explicit information exchange processes aspirations, preferences, constraints are openly discussed and the members also inquire into each other's wants.

Implicit information sharing includes statements regarding how one party's position can be improved and statements involving preference between two offers. Parties do not explicitly

state their preferences but instead preferences are communicated indirectly by indicating the direction they wish the negotiation to proceed.

Findings

As stated previously the effects of information exchange on negotiation outcomes is varied. In this section we present the empirical findings of the effects of information exchange.

Early studies show that information exchange has only marginal and conditional effects on negotiation outcomes. Pruitt and Lewis (1975) found equivocal results for information exchange, but concluded that their results suggested truthful information exchange contributed to integrative agreements if the negotiators were high in cognitive complexity (although no main effects were found). They postulated that a certain minimum amount of information must be communicated before having an impact on outcomes. Pruitt and Lewis (1975) did not manipulate type or amount of information.

Kimmel et al. (1980) investigated both explicit information sharing defined by giving information from the profit schedule and implicit information sharing. Similar to Pruitt and Lewis (1975) they did not control the information but measured the information exchange behaviour in the dyad. Their coding was more detailed than Pruitt and Lewis' (1975) coding scheme of truthful information exchange and included statements of preferences between offers and the direction of the information regarding which issues needed the most adjustment. Their findings showed no relationship with explicit information sharing (exchanging information about the payoff matrix) and judgement accuracy or with joint profit. However, there was a relationship between implicit information exchange (the relative importance of issues) and judgement accuracy and joint outcome. Kimmel et al. (1980) found a negative relationship between information exchange and a heuristic trial and error approach, which supports Pruitt and Lewis (1977) findings that these are two alternative approaches. A heuristic trial and error approach contributes to high joint outcomes without involving judgement accuracy. These findings suggest that another mechanism, in addition to judgement accuracy, can facilitate high negotiation outcomes. Using a multiple regression it was shown that implicit information exchange led to higher joint outcomes via increased judgement accuracy.

Thompson and Hastie (1990a) found that negotiators who provided or revealed information about their interests achieved more integrative agreements (achieved higher joint payoffs). Revealing and providing information were also significantly correlated with judgement accuracy. Similar to the earlier studies, information exchange was not manipulated but observed in this experiment.

Thompson (1991) conducted 2 experiments to explicitly examine the role of information exchange on judgement accuracy and integrative agreements. In the first experiment she directly manipulated actual information exchange rather than the opportunity for information exchange. Instead of observing the amount of information exchange she manipulated the amount by instructing negotiators to provide or seek information about the other's priorities. The increase in dyadic performance occurred when one or both of the negotiators exchanged information on the most important and least important issue in the negotiation. The link put forward between information exchange and outcomes is that sharing information about priorities leads to more accurate judgements and therefore negotiators reach more integrative agreements. Thompson (1991) found that even when only one party reveals information joint outcome increases and there is a strong reciprocation effect.

In Thompson et al. (1996) team versus solo negotiators were studied and their findings suggested that information exchange, especially information about priorities, led to higher joint outcomes. They postulated that this type of information exchange led to higher judgement accuracy. They also found evidence that as long as one party instigates the flow of information all will benefit. However, Pinkley et al. (1995) found results that full information in itself is not sufficient to produce integrative agreements. They conclude that both information and expectation that the preference structures are variable are necessary for highest joint outcomes. Their findings suggest that although judgement accuracy and information exchange are related, a simple one way causal explanation (information exchange causes more accurate judgement) is not correct.

All the empirical studies indicate that there exists some relationship between information exchange and negotiation outcomes, and point to the relationship between judgement accuracy and information exchange. Pruitt and Lewis (1975) , Kimmel et al. (1980),

Thompson and Hastie (1990a) used behavioural coding to examine information exchange and Thompson (1991) manipulated information condition to determine the effects of information exchange on judgement accuracy and outcome. Both Pruitt and Lewis (1975) and Kimmel et al. (1980) were more explorative in their investigation into information exchange than Thompson's (1991) controlled experiment.

The findings regarding the role of information exchange for negotiation outcomes differ depending on the type of information, the amount of information, and individual difference variables. In addition, it appears that there are other mechanisms operating in the negotiation than just information exchange and judgement accuracy. What we can conclude is that information exchange *can* be a key ingredient for judgement accuracy and outcomes in a negotiation. In the next section we present the construct judgement accuracy.

2.5.1.2 *Judgement accuracy*

Negotiators can have judgements of the other party, judgements of self, interpersonal judgements of utility, judgements of offers and counter offers, judgements of outcomes and judgements of the negotiation process (Thompson and Hastie, 1990b). Since there are many different decision errors that can occur in a negotiation we focus on biases that emerge in negotiations, are specific to the negotiation task, and are consistently related to negotiation outcomes. One particular inaccuracy in judgement that often occurs in a negotiation and is related to the outcomes, is the fixed pie bias. Recently another bias, the incompatibility error, has been discovered. In this section we will first examine the empirical evidence that general judgement accuracy is related to negotiation outcomes and then present research focused on fixed pie bias and incompatibility bias.

Both fixed pie error and the incompatibility biases are considered judgement errors because negotiators fail to recognise that their interests are not completely opposed (fixed pie) or in fact the same (incompatibility error) and that there exists potential for an integrative agreement. Integrative agreements are possible in many negotiation situations, however due to judgement errors negotiators often fail to recognise this potential.

If judgement accuracy is present in a negotiation do negotiators achieve high joint outcomes? Walton and McKersie (1965) discussed the importance of insight for reaching integrative agreements. Insight refers to the negotiator gaining an understanding of the other party's preferences and priorities and can be equated with judgement accuracy. A significant correlation between insight and joint outcomes has been found (Carnevale and Isen, 1986, Kimmel et al., 1980 and Thompson, 1991).

In Kimmel et al. (1980) judgement accuracy was measured by a post negotiation questionnaire asking subjects to rank the other parties issues. They called this an insight index and examined the degree to which accurate insight into other's profit schedules led to higher outcomes. Carnevale and Isen (1986) used similar measures to Kimmel et al. (1980). Their measures of insights can be criticised because the ranking the issues can tip off the subjects that there are differences in priorities (Thompson and Hastie, 1990a). Although Kimmel et al.'s (1980) study was explorative regarding insight, they did find a high correlation between insight and joint outcomes.

Thompson (1991) also examined general judgement accuracy and measured accuracy by asking the subjects to identify the other party's interests. Their accuracy measure was more detailed than the studies presented above, and significant correlation between judgement accuracy and joint outcomes were still found.

Thompson and Hastie (1990a) conducted 2 studies to directly investigate the role of the fixed pie bias and the incompatibility bias on the outcomes in negotiation. Their research revealed that the fixed pie error changes over the course of the negotiation. Negotiators who recognise earlier in the negotiation that priority judgements differ among negotiators perform better than those who do not realise this until later in the negotiator or who do not recognise this at all. They also found that these biases were strongly correlated with joint outcome. Thompson and Hastie (1990a) used several different measures of the fixed pie bias in their two studies. All these measures were highly correlated from conservative estimates (given one point for any estimate that was not fixed sum), to think aloud procedures, to written measures. Dyadic level measures were created by summing negotiators' scores. In their study they examined the

correlation between accuracy (measured as a lack of fixed pie bias) and outcome. Their research provides empirical measurements and links the fixed pie bias to joint outcomes.

Another study by Thompson (1990b) examined fixed pie bias and incompatibility error. Fixed pie bias has been alternatively called logrolling accuracy in this study. The measures are exactly they same. Thompson and Hastie (1990a) found a high correlation between negotiators having incompatibility error and subsequently choosing a sub-optimal alternative. Again inaccurate assessment of the other party's interests led to lower individual and joint performance. Thompson and Hastie (1990a) found that the incompatibility bias and fixed pie bias were not significantly correlated. Their findings indicated that accuracy of negotiator judgements paralleled performance.

Research has also postulated *how* the fixed sum bias leads to less integrative outcomes (c.f. Pinkley et al., 1995) and why negotiators have fixed pie biases. Biases in causal attribution are systematic mistakes in determining the causes of behaviour. The fundamental attribution error occurs when people attribute the causes of behaviour to the individual (internal factors) instead of the situation (external factors). Self perception biases are systematic errors people make perceiving their own behaviour, attitudes, or values. The fixed pie assumption could be connected to a false consensus bias (i.e. other people have similar wants as you do), or to availability bias (it is easier for the negotiators to retrieve information concerning themselves). Thompson and DeHarpport (1994) suggest that people may pay more attention to fixed pie consistent information because information consistent with expectations are more likely to be recalled, people may use stereotypes to infer what they cannot remember, and people often use confirmatory information processing i.e. they do not look for information that disconfirms their hypotheses. Thompson and DeHarpport (1994) conclude that basic information processes promote the fixed pie perception in negotiation. The conclusions so far indicate that the fixed pie bias affects outcomes via both information availability and information processing errors (Pinkley et al., 1995). Pinnkley et al.'s (1995) findings support that the relationship between judgement accuracy and information exchange is dependent on the individuals and the negotiation situation. Sometimes information is available in the negotiation but negotiators do not use it because of their biases. Sometimes the information is not available or made available so biases develop from focusing on ones own position.

In the dyadic negotiation literature the information processing approach has usually examined how negotiators deviate from rational behaviour (see Bazerman and Carroll, 1987; and Neale et al. 1990; and Thompson, 1990). This orientation has generally discussed biases in negotiators decision making. The information processing view sees negotiation as including the generation of alternatives, evaluation strategies, strategy and persuasion schemas, and implementation or enactment skills (Carroll, 1991). Judgement biases can occur at any stage and there are some biases more likely to occur in a negotiation decision making task. The judgement biases that have been found to be specific to negotiation are the fixed sum bias and the incompatibility bias. These errors are related to the general judgement accuracy regarding the accuracy of negotiator's perception of the other party's interests. These biases appear to lead to poorer performance in dyads. However most of the studies reported in this section have not examined the causal relationship between judgement accuracy and outcomes. Perhaps other mechanisms are accounting for the high correlation between judgement accuracy and joint outcomes. Biases do exist in dyadic negotiation and are related to lower quality outcomes (cf. Neale and Bazerman, 1992). In the next section we will present other related processes that might influence judgement accuracy, information exchange and joint outcomes.

2.5.1.3 Other constructs

In the negotiation many communication, strategic and procedural activities take place. The two concepts we are most interested in investigating are information exchange and judgement accuracy based on their relationship to complexity, the behavioural decision theory and the empirical and theoretical indications of their importance. Three additional concepts should also be included in our investigation: procedural structure, problem solving, and task requirements. These three concepts are linked to information exchange and judgement accuracy, as well as to integrative outcomes. Each of these constructs will be described and their importance to our investigation will be clarified.

Procedural structure is related to how the negotiating unit structures the process of negotiating. The structure can incorporate the order and number of issues the dyad negotiates at a time (agenda), and how much time the dyad spends organising the negotiation. The

structure of the negotiation affects the way information is exchanged and could influence judgement accuracy. The type of agenda dyads use, has been related to integrative agreements. Two types of agendas have been investigated sequential and simultaneous. With a sequential agenda, the dyad examines and decides on issues one at a time. With a simultaneous agenda the dyad examines and decides on more than one issue at a time, usually a package of all the issues. The dyadic negotiation research has found increased outcomes when dyads use simultaneous agendas (c.f. Yukl et al., 1976).

The second construct of interest is problem solving. To what degree can a negotiation unit be characterised as engaging in problem solving? Problem solving behaviour stems from a problem solving orientation or strategy. A problem solving orientation of one or both parties contributes to the formation of integrative agreements (Pruitt and Carnevale, 1982 and Walton and McKersie, 1965). A problem solving approach also has been linked to the information exchanged in a negotiation (Walston and McKersie, 1965). When the negotiators view the issues or parts of the negotiation as a problem to be solved the behaviour produced is usually flexible and inventive and the negotiators search for a variety of options (Walton and McKersie, 1965). Problem solving is often manipulated by instructing the negotiators to take a particular approach. For example, Pruitt and Lewis (1975:65) instructed participants to “view the bargaining situation as a solvable problem. Attempt to play down the conflict nature of the task and view it as a problem situation”

A problem solving orientation differs from a co-operative orientation in that a co-operative orientation entails high concern for self and high concern for the other’s outcomes. A problem solving orientation focuses on finding an alternative the other can accept rather than one that is in the other’s best interests. If one or more members in a dyad approach the negotiation as a problem to be solved rather than a bargaining situation to be won, then integrative agreements are more likely.

Problem solving is useful to include when examining the relationship between complexity, information exchange and judgement accuracy. First, problem solving is related to more integrative agreements. Second, problem solving could explain how complexity affects

outcomes either through facilitating the information exchanged and subsequently judgement accuracy or through trust.

The final construct is related to the type of tasks used to investigate integrative agreements, logrolling. This type of task requires that parties trade issues of differing importance. In order to observe the impact of complexity on the processes and outcomes in a negotiation it is imperative that we also monitor for behaviour directly related to the particular requirements of the task. Complexity might affect the ability of the negotiating unit to engage in this behaviour. Trading issues is critical to the outcomes in these types of tasks so it needs to be measured in relation to the other process variables.

2.5.1.4 Summary

What occurs in the negotiation that leads to integrative agreements? We have isolated two determinants that are related to complexity and integrative agreements and are central constructs in behavioural decision theory: information exchange and judgement accuracy. We have argued that these constructs will help us to understand the effects of complexity on integrative agreements. The relationship between judgement accuracy and information exchange is dependent on several other variables, however their importance and relationship to integrative agreements has been argued theoretically and shown empirically. In addition, three other constructs were presented, procedural structure, problem solving, and task requirements which could affect the relative importance of information exchange and judgement accuracy. In the next section we will examine how the addition of more people and increases in complexity might affect integrative agreements and the constructs mentioned in this section.

2.6 Adding more people to a negotiation, what happens?

Theoretical arguments and empirical findings have begun to outline how the addition of more people with differing preferences, affect the processes and outcomes in a negotiations. In this section the theoretical contributions are presented in section (2.6.1) and the empirical findings are presented in (2.6.2). Our review of group negotiations will centre on group negotiations in which stable coalitions are not possible. The main interest in this dissertation is to compare

dyads and groups directly, since dyads cannot form coalitions we examine group negotiations where no stable coalitions can be formed.

2.6.1 Theoretical contributions

In the negotiation literature there has been a plethora of research on dyads but only recently a more dedicated interest in group negotiations. The conclusion reached in this section is that groups are more complex than dyads and that this complexity will lead to lower negotiated outcomes.

Much of the existing research on negotiation is oversimplified often assuming only two parties (Pruitt and Carnevale, 1993). In the last few years, however, there has been an increased interest in group negotiations. Most of the theoretical arguments regarding group negotiations set out to differentiate group from dyadic negotiation. Groups differ from dyads in the following ways:

1. the number of parties involved and the nature of their role in the negotiation process;
2. the outcome being sought and the processes used to obtain that outcome; and
3. the level of social differentiation among the parties (Kramer, 1991: 311).
4. coalition formation (Bazerman and Neale, 1992).

These differences can lead to:

1. Increases in the demands on information processing (Bazerman et al., 1988 and Kramer, 1991).
2. Increases in procedural complexity (Kramer, 1991).
3. Increases in social complexity.
4. Increases in strategic complexity (actions directed at one party can be seen by the other parties) (Kramer, 1991).
5. Necessity of social decision rules (Bazerman et al., 1988).
6. Increases in interpersonal complexities (Bazerman et al., 1988).

Group negotiation differs from dyadic negotiations in a number of ways however we have stated that our interest is in the increases in information processing caused by the addition of more parties with their own interests. We have also stated that a direct comparison between

dyads and groups precludes an examination of coalitions. Based on these considerations the differences we are most interested in examining are those associated with increases in information processing.

What are the consequences of these change from dyadic to group negotiation? Bazerman et al. (1988) conclude that integrative agreements in a group situation are more difficult to achieve because increases in information load lead to systematic errors in negotiator judgement: specifically two biases, the fixed pie bias, and the ignoring of others' cognitions. They specifically predict that the fixed pie perspective is more likely to be a problem in group negotiations than in dyadic negotiations because one, the negotiators cannot process all the information and two, negotiators are not able to simultaneously problem solve and distribute so they will tend towards the distributive perspective.

The other bias Bazerman et al. (1988) discuss is ignoring the cognition of others which is considered imperative to reaching a quality outcome. This includes thinking about the concerns and strategy of the other person. As the number of parties increase the amount of information to process increases and simplifying strategies are employed. One simplifying strategy is not to consider the other's cognitions.

They also postulate that as group size increases norms become increasingly important. Norms can be defined certain regularities of behaviour or rules of conduct established by members of a group or society. Norms increase with group size to maintain consistency. Norms also govern perceptions of fairness. As the number of parties increase in a group negotiation individuals might be expected to conform more to group norms and procedures. This is based on the social psychological research regarding how individuals look to the group to determine behaviour (Asch, 1951). Bazerman et al. (1988) argue that norms can inhibit information exchange.

Kramer (1991) also claims that integrative agreements will be more difficult to achieve for groups than for dyads. With informational and computational complexity the amount of information to be processed becomes larger, there are more interests to be integrated and accommodated, and the bargaining space (or potential agreement opportunities) is enlarged. Conceivable effects of informational complexity are: information overload (which leads to

how the information is processed and used, and the judgement heuristics employed); high levels of uncertainty and ambiguity regarding other parties' positions (which could lead to difficulty in discovering clear guidelines for action); and higher levels of stress (Kramer, 1991).

He postulates that procedural complexity leads to the use of social heuristics, increase in size lead to decreased co-operation (as size increases individual negotiators may perceive less control over the process), and increases in social differentiation lead to a decrease in co-operation.

In order to combat the potential negative affects of increases in the number of parties Bazerman et al., (1988) recommend that groups can improve their outcomes by using unanimous decision rules, and not following a rigid issue by issue agenda. The unanimous decision rule allows for all parties to present their interests and provides incentives to the group to incorporate other parties' interest. Agenda determine how issues are discussed and decided on. Agendas, which allow for discussion of several issues at a time, open for the possibility of discovering packages or issues of differing priorities. Their main emphasis is that groups have to pay attention to the procedure they use and that existing group decision techniques to aid group decision making may not be appropriate in the mixed-motive context. In another paper by Bazerman (Bazerman and Neale, 1992) three consequential factors are presumed to be relevant for a group negotiation: decision rule, agenda, and coalition formation. Their emphasis again is on structuring the process. They argue that unanimous groups do better, and that groups need a structure for the process that identifies priorities, reveals individual interests, and encourages creative approaches to problem solving.

From these theoretical articles the predictions are the conclusions and predictions are the same: groups will have more difficulty reaching integrative agreements. The mechanisms that lead to lower outcomes are related to information processing, procedural, social and strategic difficulties.

Other theoretical papers on group negotiations are found in the political science literature and may give us insight into group negotiations. Although we will highlight some research in this field, the intention is not to review this literature extensively. There are many differences in the types of negotiations found at the international level as opposed to the organisational

level. For example, negotiations found in at the international level are usually larger those we find in an organisation; nation states with large and diverse constituencies are often the negotiating parties examined, whereas in organisation although constituencies might be involved we would assume they are not as diverse; and finally, the research in this body of literature is generally qualitative, descriptive, and post hoc, whereas the research we are contributing to is more experimental and quantitative. What is interesting to note is how they theorise about the effects of complexity.

Similar to the negotiation literature the political science researchers claim that increases in the number of parties leads to increases in complexity (Midgaard and Underdal, 1977; Touval, 1991; and Winham, 1977). Increases in information, actors, interests, and more uncertainty will make good solutions more difficult to find (Midgaard and Underdal, 1977) and negotiators will tend to use of simplified decision strategies (Winham, 1997). Winham (1977) also states that the whole idea of concessions diminishes with increased complexity. Touval (1991), when examining multilateral negotiation, states that reciprocal exchanges often lose their meaning because a concession offered to one party may have a differing effect upon the other parties, and may even be regarded as deleterious to their interests. . This is similar to the postulation put forward by Kramer (1991). Midgaard and Underdal (1977) emphasise that as group size increases so does the need for the normalisation of rules, again similar to the predictions of Bazerman, et al. (1988).

One difference between the recent negotiation theory on groups and the political science literature is that the political scientists argue that an optimal amount of complexity might exist in which the increases in resources will outweigh the complication of more parties (Midgaard and Underdal, 1977). Winham (1977) states that complexity can facilitate agreements being reached although he does not specify about the quality of the agreement. This suggestion is similar to Walton and McKersie (1965) who also recommended an optimal number of issues to be included in a negotiation so that trade offs are possible and integrative solutions are more likely.

Similar to the above reasoning Touval (1991) argues that with a larger number of parties there is likely to emerge asymmetries in interest, priorities, which could facilitate package

agreements and encourage circular bartering. He also postulates that competitive attitudes in a multiparty negotiation are reduced since there is the presence of parties with whom no serious conflict exists on a particular issue. This is contrary to Bazerman et al.'s (1988) who thought that negotiators simplifying strategies would lead to more distributive approach.

We can conclude that similarly to the negotiation theorists Midgaard and Underdal (1977) expect that as the number of parties in a negotiation increase information load increases however they contend this not always negative and that under some circumstances the added complexity could be beneficial for finding integrative agreements.

From the theoretical accounts reviewed above the following observations can be made:

1. structuring the process of the negotiation is very important (decision rule, agenda),
2. complexity affects the use of heuristics (both social and informational) by decision makers in the negotiation,
3. (a) the degree of complexity leads can lead to lower outcomes (Bazerman et al., 1988 and Kramer, 1991)

or

- (b) the degree of complexity can lead to good outcomes (Touval, 1991 and Winham, 1977).

Although there are differences with regards to the effects of complexity, the political science literature is focused more on reaching agreement than the actual quality of the agreements reached. Although an optimal complexity might exist we are most interested in first comparing dyads and groups. For these reasons we will concentrate on the postulations put forth by the negotiation theorists that increases in the number of parties will making reaching integrative agreements more difficult.

In the next section we review the empirical research on group negotiations.

2.6.2 Empirical findings

Moving from theoretical analysis of group negotiation to empirical findings, the articles presented in this section represent the most recent attempts to understand group negotiation. Consistent with the theoretical postulations the premise of most of the articles has been that integrative agreements in a group negotiation are more difficult to reach than in a dyad.

However, only Shapiro and Rognes (1995) compare dyads and groups. The studies in this section have generally used an experimental approach and a logrolling task to investigate how groups negotiate. We have not included in our review research that has explored stable coalition behaviour in groups. As stated previously our interest is to compare groups and dyads directly and therefore research dealing exclusively with coalition behaviour will not be examined. We have included one article that examines coalition behaviour within issues, however this research does not allow for coalitions across issues and measures other variables relevant for our investigation. We begin with a review of the studies in chronological order since these have generally built on each other's findings.

One of the first studies to examine group negotiation was Thompson, Mannix, and Bazerman (1988). They argued that many group decisions require both co-operation and competition. They adapted the logrolling task used in the dyadic negotiation research (cf. Kelley, 1966 and Pruitt and Lewis, 1975) for a 3-person negotiation. They used a within subjects design so that negotiators participated in 4 different 3 issue negotiation tasks, with different people in each task.

They manipulated 2 procedural variables and one cognitive motivational frame. They were interested in discover if these manipulations were effective aids in a groups negotiation. The two procedural variables investigated were (1) agenda versus no agenda (controlling the consideration of issues in the negotiation), and (2) majority versus unanimous decision rules (how to reach an agreement). The cognitive-motivational frame was the aspiration level of the negotiators. Thompson et al., (1988) linked these variables with the quality of the group outcome, the division of resources, and the of the group negotiation. Their first hypothesis proposes that a majority decision rule fails to recognise the strengths of individual preferences whereas unanimous decision rules allow for all members' preferences to be considered and the strength of these preferences to be revealed. They hypothesise that groups in the unanimous decision rule condition would achieve more integrative solutions than the groups in the majority decision rule condition. With regard to the consideration of issues they predicted that groups who followed a defined issue by issue agenda would achieve less integrative agreements than those who negotiated without an explicit agenda. Agenda in this research was equated with sequential consideration of issues and the no agenda condition

assumed *no agenda and therefore no restriction to sequential consideration of issues*. Thompson et al. (1988) contended that when groups followed this issue by issue agenda that they would be unable to logroll and compensate for losses on other issues. They predicted that if a majority decision rule was used this would lead to coalition formation (within issues) which would lead to majority interests being served at the expense of the minority. Their next hypothesis argued that coalitions were more likely to form when a sequential agenda was used and majority decision rule was in effect and that the distribution of resources would be more unequal. With regards to aspiration level they predicted that group members who held moderately high aspiration levels would achieve higher total profits than those group members without explicit aspirations. There has been a great deal of research documenting the effect of aspiration levels on outcomes in dyadic negotiation. Basically individuals with higher aspirations do not settle for compromises and are motivated to work harder to achieve higher outcomes (see Thompson et al. 1988).

The results indicated that there were no main effects for agenda versus no agenda or high versus no aspiration level on the total points groups earned. Significance was found for the effect that the decision rule had on equality of resource distribution. Groups using a majority rule divided resources more unequally than did groups using a unanimous decision rule. Groups with explicit agendas also divided the resources more unequally than the groups in the no agenda condition. All the groups reached an agreement and they calculated the integrativeness of the agreement through joint profit.

The contribution of this study was to first highlight the importance of examining group negotiations and to show that findings in the dyadic negotiation research are not necessarily transferable to a group negotiation. They also included a measure of resource distribution in addition to joint profit to evaluate high quality outcomes. Their research indicated that predictions from the dyadic research regarding aspirations do not apply in group negotiations. Their lack of findings for the agenda variable can be attributed to their manipulation (in their no agenda condition negotiators also followed a sequential progression through the issues Mannix et al., 1989) and so conclusions regarding the use of agendas could not be drawn from this research. Their focus was on the effects of procedural and motivational variables on outcomes in group negotiations.

The next study by Mannix et al. (1989) investigated the impact of issue agenda, correcting for the manipulation error in Thompson et al. (1988). They also investigated decision rule, and power, on the quality of a group negotiation. They ran a within subjects design where 3 negotiators participated in 4 negotiations, negotiating with different parties each time. The task structure was similar to the ones used in the dyadic literature and the outcome measures they used were individual and total profit. Again the main focus is on manipulation of procedural variables.

They found that simultaneous consideration of issues produced better results than a sequential consideration of issues and groups using a majority decision rule and a sequential agenda obtained the fewest points compared to all the other groups. However, they found no main effect for majority rule. They surmised that this difference in findings with Thompson et al. (1988) could be attributed to the reservation prices given the subjects. In the current study negotiators had more attractive alternatives and therefore negotiators were less likely to form exclusive coalition within issues. Finally, their manipulation of power affected individual outcomes but not group outcomes. Using individual profit as an outcome variable can be criticised since it is considered invalid to run statistical tests on data that is not independent. Their lack of findings for power balance within the group affecting group outcomes were postulated to be related to the existence fairness norms which prevented individuals with high power from exploiting their potential.

To summarise their findings it appears that the type of agenda used can affect group outcomes and the effectiveness of a unanimous decision rule to reach integrative outcomes might depend on the structure of the task (the reservation points given). Their research did not directly compare dyads or groups however in their discussion they point to the importance of investigating the size of the group since the number of parties in the group will influence the ability to implement packages (simultaneous consideration of issues) and to use unanimous decision rules.

The third study built on the previous two by again examining procedural variables. Weingart et al., (1993) investigated the effects of agendas, and in addition negotiator orientations. This study used a different task structure than Thompson et al. (1988) and Mannix et al. (1989). It

included 4 negotiators and 5 issues. They manipulated agenda more directly (similarly to Mannix et al., 1989) so that groups were either instructed to follow simultaneous or sequential agendas.

Weingart et al., (1993) conducted two studies investigating group negotiations: one focusing on outcomes the other on process. Neither of these studies directly compared dyads and groups although dyadic research was used to predict what would help groups achieve higher quality outcomes. In the first study they examined the impact of consideration of issues (simultaneously in packages or sequentially issue by issue agendas) and motivational orientation (individualistic versus co-operative) on group performance. They began with the premise that groups may have more difficulty than dyads reaching integrative agreements due to increases in both information processing and interpersonal co-ordination demands. They viewed consideration of issues and motivational orientation as two types of intervention that could improve the negotiation outcomes. Weingart et al., (1993) argued that the consideration of issues (agenda) would help structure the information to either facilitate or impede the realisation of integrative agreements. They stated that the motivational orientation would supply general goals that provided participants with a behavioural direction and which enabled them to evaluate potential agreements. They justified their choice by drawing on Pruitt's (1981) research which they stated established that each of these interventions, in dyadic negotiations, influences co-ordination and ameliorates the quality of joint agreements. The theoretical justification for their choice rests on two factors: one that these interventions have not been examined in a group negotiation and two, these interventions have not been examined together. They claim that from a practical standpoint these interventions could be realistically used in organisations to improve the quality of group negotiation. Although we would agree that agendas can be easily manipulated in organisation we are more doubtful about the ability and ethical appropriateness of manipulating orientation. For example, if we find that an individualistic orientation can be helpful and we instruct organisational members to only think about their own outcomes and not the organisations we believe in the long run this could have negative affect on the individual and the organisation. In addition there are ethical implications if organisations were to instruct their members to have co-operative orientations. Although we disagree with their assumptions regarding the orientation

intervention we are interested in their examination of whether research findings from the dyadic literature could be used in the group context.

Their hypotheses, consistent with the dyadic literature, were that groups who consider issues simultaneously will reach higher quality decisions than groups that consider issues sequentially, and that groups whose members are co-operatively oriented will reach higher quality decisions than groups whose members are individualistically oriented. Co-operative refers to trying to maximise own and other's gain and individualistic refers to maximising only one's own gain. From the dyadic research we know that a co-operative orientation can lead to higher joint benefit (Lewis and Fry, 1977; Pruitt, 1981; Pruitt and Lewis, 1975; Schultz and Pruitt, 1978.)

Weingart et al. (1993) found that there was a main effect for consideration of issues which was significant for all measures of joint benefit. Joint benefit was measured with joint sum, inferiority index and Pareto optimality. They also included the number of impasses. Their motivational orientation manipulation, co-operative orientation, was significant only for the inferiority measure. They found no significant results that issue consideration and motivational orientation would interact. They did find that the individually oriented group who considered issues sequentially performed less well than all the other three groups and that groups in the individualistically oriented, sequential issue consideration condition, were more likely not to reach an agreement.

Overall, the results suggested that packaging issues and a co-operative orientation increased group performance. This is similar to predictions from the dyadic negotiation literature. The use of simultaneous consideration of issues also increased the probability of reaching an agreement regardless of motivational orientation. This highlights the importance of procedural structure. Although they state that their findings contradicted a study by Winham and Bovis (1978) who found that consideration of more than two issues was too complex for groups and counterproductive to high quality decision making, we believe this comparison is inappropriate. We will briefly review Winham and Bovis's (1978) research to clarify this point.

Winham and Bovis's (1978) were examining realistic international negotiations composed of two negotiating groups with sixteen people to a side. They were interested in intragroup as well as intergroup complexity. Their findings were based on agreements achieved and pointed to the importance of structure for the negotiation to be successful. Because of the complexity (the number and detail of the issues) they suggested trading off, on unrelated but roughly equivalent issues, as the best way to achieve successful agreements. Winham and Bovis' analysis, task, and method were all different from Weingart et al.'s (1993) experiment. The most interesting observation made in Winham and Bovis's analysis was that simultaneous consideration of all issues (full package agenda) failed due to the multiplicity of interests. They had negotiations with 6 issues and varying number of alternatives on each issue, whereas Weingart et al. (1993) used a task with only 5 issues and 5 alternatives on each issue. Although there could be many explanations as to why differences were found between Weingart et al. (1993) and Winham and Bovis (1978) one possible explanation is that considering 5 issues in a group negotiation (Weingart et al., 1993) did not exceed the individuals' or the groups' information processing capacity. The structure of the two tasks were so different it is not believed that Weingart et al.'s (1993) study contradicted Winham and Bovis' (1978) findings. Also the differences in task complexity, and task structure make comparison between the studies inappropriate. There must be future research precisely examining the different dimensions of task complexity and its effect on outcomes.

What we can conclude from Weingart et al.'s (1993) research is the significance of agendas (consideration of issues) for reaching high quality decisions in a group negotiation. Although orientation had some effect it did not have significant main effects across all the dependent variables. No interaction was found between motivational orientation and agenda used.

In their second study they examined the negotiation process. They wanted to explore *how* the agenda and orientation interventions affected outcomes. They postulated that the agenda and orientation of negotiation group affected the way the information was shared. In the second study they examined process. They only used 4 groups to examine the processes, 1 from each condition.

They reran the negotiation, videotaped the session, and coded the behaviour. The results indicated that simultaneous agendas cued group members to share information about preferences and priorities. They postulated that this information produced a greater understanding of members' preference structure. They measured insight of the negotiators and found that groups in the simultaneous condition had more accurate insights than the negotiators in the sequential agenda condition. They found results contradicting those results found for dyads that a co-operative orientation stimulates information sharing and increases insight. They found that in co-operative group outcomes increased because of trust which encouraged reciprocity. Therefore they propose that reciprocity may be more important than information exchange in groups. In summary, Weingart et al. (1993) provided support for the importance of simultaneous agendas and provided some exploratory evidence of the underlying processes. However it should be reiterated that this study was exploratory using only 4 groups.

Overall, Weingart et al., (1993) found that both agendas and co-operative orientation are important so for groups to reach integrative agreements. Although these findings are consistent with the dyadic research, their second explorative study suggests different underlying mechanisms. It appears that information exchange may play a different role in groups and dyads depending on the agendas used and the orientations the negotiators have.

The fourth study we will examine continues to investigate procedural variables however they move away from agenda and instead investigate communication and structure. Arunachalam and Dilla (1995) manipulated the communication (face to face or computer mediated) and structure (nominal group techniques, delphi, and brain storming) of the negotiation. The structuring techniques were adapted from the group decision research to reduce losses that can occur in the process. They defined process losses for a negotiation as the difference between actual outcomes and fully integrative outcomes. All these techniques are meant to help facilitate the flow of information and reduce judgement error. The computer mediated communication is meant to create process losses by increasing negotiation judgement error with the underlying mechanism for this being restricted information flow and decreased co-operation.

They investigated an intraorganisational group negotiation containing 4 issues and 3 parties. They measured quality outcome with joint profit, individual profit and inequality of distributions and their task was similar to both the dyadic tasks (Kelley, 1966) and the group tasks (Mannix et al., 1989 and Thompson et al., 1988). Their task allowed for two measures of judgement accuracy: lack of fixed pie bias and lack of incompatibility error. Arunachalam and Dilla (1995) reported that information sharing in groups, while using a structured negotiation agenda, lessens fixed pie error. However, since information exchange was not controlled exclusively, it is not clear the impact of information exchange on outcomes and judgement accuracy. A repeated measures design required that participant participate in 3 simulations. Their results not only showed a strong correlation between judgement accuracy and outcomes, but also causal relationships between these constructs. They measured both fixed pie and incompatibility error and their results differed from those found in the dyadic literature (Thomson and Hastie, 1990a). Biases found to correlate in the dyadic research (Thompson and Hastie, 1990a) did not correlate in the group negotiation. They found that negotiation structure by reducing the fixed pie bias caused increases in both individual and joint profits and decreases in inequality of resource.

Their findings support that judgement accuracy is causally related to negotiation outcomes, whereas in the dyadic literature generally correlational relationships have been investigated. In addition, they find structuring of the negotiation affects judgement errors in groups. Their research has important implications for our study indicating the centrality of judgement accuracy in influencing joint profit and the necessity to understand the role of information exchange which they claim mitigates the fixed pie error. They propose that further research should address how information exchange interacts with structures.

The last group negotiation study we will review is the only one to compare dyads and groups. Shapiro and Rognes (1996) investigated groups and dyads in a cross-cultural setting. They investigated how orientation and culture affect processes and outcomes in dyads and groups. Their findings revealed that cultural and orientational motivational variables have differing impacts on dyadic and group negotiations. They found that a dominating orientation (views the dispute as win-lose situation) enhances the integrativeness of the agreement if the negotiators are American and negotiating in a group. Their findings similar to the other

studies discussed above indicate that elements in the process of the negotiation are different between dyads and groups. Their study however did not use directly comparable tasks.

The limited number of empirical studies on group negotiation have manipulated: decision rules, motivational orientations, agenda setting, culture, structure, communications and balance of power as independent variables that affect the formation of coalitions, judgement accuracy, the distribution of resources and negotiation outcomes. Most of the studies have investigated exogenous procedural variables meant to improve outcomes however no direct comparison between dyads and groups on comparable tasks has not been investigated.

Also many of the studies in group negotiation, because of the demands in the number of subjects used repeated measures designs (Arunachalam and Dilla, 1995; Mannix et al., 1989; and Thompson et al., 1988) or reran experiments (Weingart et al., 1993). Some of these researchers attempted to eliminate possible confounds, by statistically removing the effect of participants participating in several negotiations. Using the same subjects across negotiations tasks, introduces possible confounds which statistical procedures cannot always remove, for example, knowledge of the experimental manipulations. We therefore believe that more precision could be introduced by using between subjects designs.

The manipulations in these group negotiation experiments were commented on individually however two points should be made. Although the findings are very strong regarding agendas we believe that it is quite unrealistic to make people consider strictly, only one issue at a time, sequential agendas, (Weingart et al., 1993). With this manipulation it is almost self evident that logrolling will be next to impossible. The type of negotiation task these experiments have employed requires logrolling to reach integrative agreements and therefore caution should be used when interpreting these results for decision tasks where integrative agreements can be accomplished using other techniques (see beginning of section 2.5).

They begin with assumptions of differences between dyads and groups but fail to empirically support these conclusions. From the research we can also conclude that dyadic research is not always applicable in the group context and the dyads and groups need to be directly compared.

2.6.3 Summary of group negotiation

From examining the theoretical contributions from the negotiation literature we discover that dyads are predicted to reach more integrative agreements than groups, and that increases in the number of parties leads to lower judgement accuracy. These propositions have not been empirically investigated. From the empirical studies we find that some interventions that work for dyads also work for groups (simultaneous consideration of issues) and that unanimous over majority decision rules produce higher quality outcomes. Differences between groups and dyads were found in the effect of orientation (Shapiro and Rognes, 1996 and Weingart et al., 1993), correlation of judgement biases (Arunachalam and Dilla, 1995), and in terms of the importance of information exchange (Weingart et al., 1993). From these empirical findings, there is a strong indication that different processes are operating in dyads and groups. Most of the empirical research has not directly investigated the difference between dyads and groups. From the research it appears there could be important differences in the determinants of integrative agreements between dyads and groups.

In order to conceptualise the difference between dyads and groups, increases in the number of parties increase the objective task complexity. By conceptualising group negotiations in terms of task complexity we can gain insight into the mechanisms and the effects of increasing the number of parties by examining the negotiation and the decision research.

2.7 Group negotiation as increases in task complexity: Other research

In this section we describe negotiation research that has investigated different levels of objective task complexity on negotiation outcomes and the decision research that has extensively researched the effects of objective task complexity on individual decision strategies. If we view increases in the number of parties with non-identical preferences in a negotiation as an increase in objective task complexity, we can derive some predictions from these research areas.

2.7.1 Time pressure in negotiation

Objective task complexity has been defined as increases in the information load of the task. In the negotiation literature there has been research on time pressure and the quality of outcomes in dyadic negotiation. In general findings reveal a main effect for time pressure. Under high time pressure participants were less able to think about the task, outmanoeuvre the other, and consider and experiment with different negotiation tactics. Time pressure combined with an individualistic motivation orientation led to lower quality outcomes (Carnevale and Lawler, 1987). Carnevale and Lawler, (1987) concluded that time pressure inhibits or constrains information exchange, lowers negotiators' aspiration, and reduces negotiators' flexibility which makes them less able to use trial and error.

There are indications from the negotiation research on time pressure that increase in this type of objective task complexity can lead to changes in the negotiation process and can lead to lower outcomes.

In the next section we briefly describe research from the decision literature that examines objective task complexity and individual and group decision making. The research from the decision literature may help us understand the effects of increases in task complexity in negotiations.

2.7.2 Decisions research: understanding complexity

Decision research: individual

In the decision making literature there has been a plethora of research done on task complexity and individual decision strategies (Biggs, 1985; Campbell, 1986, 1988; Lussier, 1979; Olshavsky, 1979; Payne, 1976; Timmermans, 1993 ; and, Wood, 1986). Task complexity in this work has been defined in terms of the amount of information to be processed (the number of alternatives, the number of attributes per alternative and time pressure). The conclusion from this research is that increases in task complexity leads to increased use of heuristics which in turn can lead to lower quality outcomes.

This research suggest that as the task characteristics of a negotiation change from two parties to many parties the decision strategies individuals will use will change. Subsequent research has supported Payne's conclusions (Biggs et al., 1985; Lussier, 1979; Olshavsky, 1979; and Timmermans, 1993) that decision strategies (heuristics) are often contingent on the task characteristics. The task characteristics most studied are related to information load.

Biggs et al. (1985) built on Payne's (1976, 1982) work as well as on Beach and Mitchell (1978). They argued that much of the research on task complexity and decision making was found in the consumer behaviour literature and therefore it was not clear whether experts who were involved in a business decision would exhibit contingent behaviour. The findings from this study suggest that even the decision processes of experts' or trained professionals' are strongly contingent upon task characteristics.

The negotiation research has already drawn inferences from BDT and now we can draw additional inferences related to levels of complexity. We know that as task demands change so does the information processing that occurs. In the next section we will introduce the group decision research that has taken this behavioural decision research and applied to the group level.

Decision research: group

So far we have discussed decisions making at the individual level. In this section we identify research that can give us insight into the two mechanisms of interest in our investigation (information sharing and judgement accuracy), in group decision making.

From the negotiation research we know that priority information sharing can be of prime importance. In the group research a related area has investigated the impact of shared and unshared information on decision making in groups. Work by Stasser and associates (Stasser, 1992; Stasser et al., 1989; and Stasser and Titus, 1987) demonstrates that group discussions in decision making tasks often revolve around information that is shared by members rather than on the unique information members hold. In addition, the focus on shared information increases as group size increases.

They propose that shared information is discussed more often based on an information sampling model. Due to the proportion of shared versus unshared information, shared information has a sampling advantage over unshared information, and therefore all other things being equal group discussions will include more shared than unshared information. Parks and Cowlin (1995) specifically investigated the impact of complexity on the group discussion thus combining the individual decision literature with the work done by Stasser and colleagues. This research provides support that as the objective task increases, the amount of information or the number of group members, decision quality decreases and the unshared information is not brought into the discussion. It should be noted that this research used different types of decision tasks and manipulation, and that these research findings only serve as an indication for group discussions in negotiations.

In a negotiation the unique information that negotiators hold is the information regarding their priorities. There are strategic reasons as well that negotiators might not share their priority information. However, from this group decision research we assume that the likelihood of sharing priority information decreases as the number of parties or issues increases.

To understand judgement accuracy in groups and the effects on group outcomes we can examine studies comparing individual and group biases. Bazerman, Guiliano, and Appleman (1984) examined the escalation of commitment in individual and group decision making. They found that groups exhibited similar tendencies as individuals to escalate commitment. Escalation of commitment is a bias found in the decision and negotiation literature. This research suggests that individual biases are found at the group level and affect group outcomes

We also know that from the group research many biases found to affect individual decision makers' outcomes can be more extreme in groups (c.f. Argote, Seabright and Dyer, 1986). We expect that increases in increases in objective task complexity will affect individual decision strategies as well as the overall negotiation. In a negotiation others' behaviour, information sharing, behaviour, strategies and tactics influence the other negotiators. Based on the group decision research we could predict that an increase in the number of people in a negotiation the more likely biases in judgements will occur and these judgements will then

influence the other parties, perhaps reinforce their biases, and affect the overall negotiation outcome.

These results have implications for the prevalence of judgement biases in groups although we must be cautious as the tasks these researchers have used are not mixed motive. Tindale (1993:122) concludes that “For decisions tasks where cognitive heuristics or inappropriate decision strategies are common at the individual level, groups often make more (or more extreme) errors than individuals”. However there needs to be more research in the group decision making field to examine the effects of increases of complexity on a mixed motive task.

In this section we presented research that can help us predict the effects of increases in objective task complexity on the process variables and outcomes in a negotiation. We will now conclude this chapter with a summary of our literature review.

2.8 Summary and positioning

Throughout this chapter we have argued that the effect of people complexity on the processes and outcomes in a negotiation must be directly investigated for two interrelated reasons:

- Lack of direct empirical comparison between dyadic and group negotiation
- Need for direct comparisons so that the findings from the dyadic research can be appropriately applied to groups.

We have positioned ourselves within the negotiation field drawing extensively from previous dyadic and group negotiation research. A lack of empirical research examining the similarities and differences between dyads and groups was identified, and related negotiation studies and theoretical arguments were used to predict how group and dyadic negotiations would differ.

Specifically, from the group negotiation research we found that no studies had systematically compared dyads and groups on a similarly structured task. Many of the theoretical and empirical studies assumed dyads would perform better than groups or that there would be differences between dyads and groups, yet no study tested these propositions explicitly. It

should be noted that the political science literature on complexity proposed that there might be an optimal level of complexity. However, for the type of task under investigation in this study, the theoretical reasoning and the applicability of the negotiation theory is more appropriate. Before further research is conducted on group negotiation, a clear understanding of the differences between dyads and groups should be established. This requires an empirical investigation examining the similarities and differences between dyads and groups.

Differences between dyads and groups were conceptualised as an increase in objective task complexity. From the decision research increases in OTC have been determined by changes in task characteristics that increase information load. In a negotiation, task characteristics change and information load increases when more parties with non-identical preferences are added to the negotiation. An increase in the number of parties with non-identical preferences was labelled an increase in people complexity. Objective task complexity can also increase with an increase in the number of issues that are to be negotiated. In the decision research many studies have shown that increases in objective task complexity affect the decision strategies that decision-makers use. These decision strategies can lead to sub-optimal outcomes. Decision research at the individual and group level has been included to add insight into the potential effects of people complexity on the process and outcomes in a negotiation.

Ideas about how OTC, people and issues, might affect outcomes via judgement accuracy and information exchange, were taken from the negotiation and the decision literature. Complexity is very important in many decision domains including negotiations, however, few studies have examined differing levels of complexity (i.e. dyads to groups) in negotiations. Some research exists which investigates different levels of complexity (defined by time pressure) and supports our ideas that as complexity increases outcomes can decrease. From the negotiation and the decision literature we argued that it is imperative that the effects of varying levels of people complexity on a mixed motive task be investigated. It was also contended that the effects of increases in issue complexity in dyads and groups should be examined.

The chapter began by defining negotiation as a type of decision making task and argued that behavioural decision theory was an appropriate theoretical model for understanding this phenomenon. Integrative agreements were defined as high quality outcomes in a negotiation. These types of solutions have been studied extensively in the literature however problems with measurement of these solutions were noted. It was argued that in the present study that both subjective and objective dimensions should be used to define integrative agreements.

A review of the determinants of integrative agreements revealed several variables that should be investigated in this study. Judgement accuracy and information exchange were the first and primary intermediate variables chosen. These variables have received empirical support, linking them to objective task complexity, the decision theory, and integrative outcomes. In addition, both these variables have been found to be important for dyads and groups. Our second set of intermediate variables is related to groups and dyads and integrative agreements. Procedural structure is postulated to be more important for groups than dyads and has been shown to be a significant variable contributing to both dyads and groups achieving integrative agreements. Procedural structure is also assumed to be related to information exchange and judgement accuracy. From the negotiation literature, problem solving is thought to be more difficult in groups and an important determinant of integrative agreements. In addition, problem solving has been linked to information exchange.

Based on the arguments in this chapter we believe that research must focus on a direct comparison between dyads and groups. An investigation should also include varying levels of issue complexity within dyads and groups so that the effect of different types of increases in information load can be examined.

In this study we are most interested in the OTC and judgement errors associated with the task, rather than the social dimensions or interpersonal dimensions of the task. Therefore our literature review has focused on the negotiation and group decision-making literature related to these issues. We have chosen for our investigation to first determine the effects of the objective task complexity (people and issues) so that we can establish if differences exist in mixed motive tasks. We do not discount the social dimensions, or subjective dimension of increases in complexity, however our aim is to first establish the contribution of the objective

increases in task complexity. In the next chapter the model and hypotheses of our investigation will be put forward.

CHAPTER 3

RESEARCH MODEL & HYPOTHESES

The objective in this chapter is to present the conceptual framework and research hypotheses for my investigation. The conceptual framework will be based on the literature review and will provide the necessary foundation for building the research hypotheses. The chapter is organised as follows: In section 3.1 a brief summary of the literature review and a clear statement of the research problem will be presented. In section 3.2 two conceptual models will be introduced to illustrate the relationships among the variables. Finally, in section 3.3 the hypotheses that will be tested in this study stated.

3.1 Statement of the Problem

From the literature review in the previous section it was argued that a direct comparison of dyads and groups is necessary. By conceptualising the difference between a group and a dyad as an increase in the objective task complexity, specifically people complexity, the effects of this increase on the processes and outcomes in a negotiation can be postulated. The primary goal of the present study is to compare dyads and groups and thereby explicitly link varying degrees of people complexity to the processes and outcomes in a negotiation. A secondary consideration is to examine increases in objective task complexity through increases in issue complexity. From the decision theory any increase in objective complexity, whether through increasing the number of parties or the number of issues, should affect decision outcomes. We examine both ways of increasing objective complexity to examine how they are similar and/or different in a negotiation.

The negotiation literature emphasises differences between dyads and groups (cf. Kramer, 1991,) yet there has been no empirical study directly comparing dyads and groups on the same task. The theory simply hypothesises that increases in people complexity will affect key processes and determinants of integrative agreements such as information exchange, judgement accuracy, and problem solving behaviour. It is therefore necessary to identify whether these determinants are the same (or different) in dyads and groups so that we do not incorrectly apply the prescriptions for dyads to groups.

From the negotiation theory (Bazerman et al., 1988; and Kramer, 1991) and the decision research (Biggs, 1985; Campbell, 1986, 1988; Lussier, 1979; Olshavsky, 1979; Payne, 1976; Timmermans, 1993; and, Wood, 1986) findings clearly indicate the increased use of simplifying strategies by individuals as OTC increases. These simplifying strategies can lead to lower judgement accuracy, and judgement accuracy has been linked to integrative agreements in negotiations (Thompson, 1991, Thompson and Hastie, 1990a). Information exchange has also been empirically and theoretically related to both judgement accuracy and negotiation outcomes. The focus of this study is therefore on these constructs (information exchange and judgement accuracy) which connect people complexity to decision theory constructs and decision theory to negotiation outcomes.

Other constructs that are related to people complexity and integrative agreements are problem solving and procedural structure. Both problem solving and procedural structure can influence the exchange of information and judgement accuracy. Problem solving and procedural structure can influence how the negotiating unit exchanges information (the order, the amount, and the grouping) and could influence judgement accuracy directly by sending cues that the task is not fixed sum. Due to the importance of problem solving and procedural structure in the negotiation literature and their relationship to our independent and main intermediate variables, these constructs were also included in our investigation.

Objective task complexity is defined by changes in the task that increase information load. In addition to people complexity, we wanted to examine the effects of changes in the number of issues on information exchange, judgement accuracy, and outcomes within dyads and groups. By including issue complexity we can examine information load both in terms of people and issues. However, our main interest is to compare groups and dyads, people complexity, so we have only examined the effects of issue complexity within dyads and groups.

Consequently, the research questions derived are largely based on the need for a direct comparison between groups and dyads. The conceptualisation of increases in objective task complexity as increases in the number of parties, or as increases in the number of issues, enables us to use the decision theory to make directional hypotheses. The similarities and differences between the determinants of integrative agreements in groups and dyads also needs to be examined. The three research questions that have been formulated are:

RQ1: Do increases in objective task complexity cause decreases in the quality of outcomes in a negotiation?

RQ2: Do increases in objective task complexity affect the variables that emerge in the negotiation process?

RQ3: Do the intermediate variables that lead to high quality outcomes differ between groups and dyads?

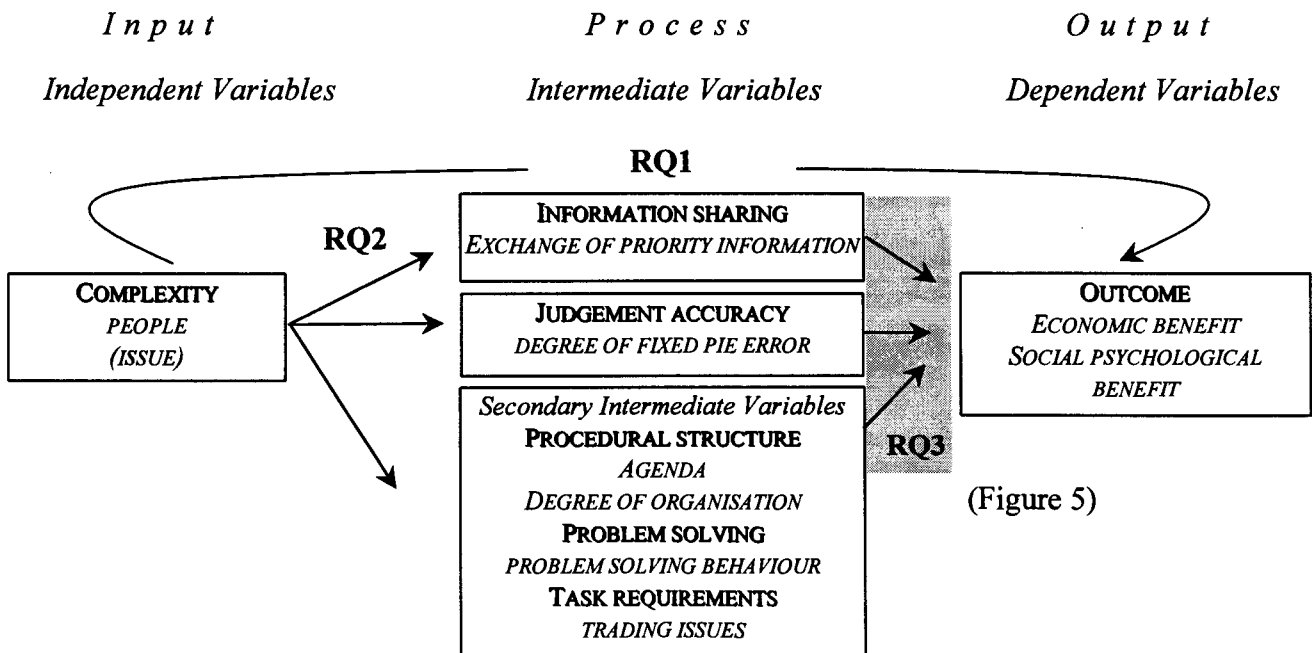
In figures 4 and 5 we present our conceptual models and incorporate the three main research questions we are interested in investigating. In section (3.2) we will describe the variables and relationships in the model, and then in section (3.3) our hypotheses, which will be grouped under each research question, will be presented.

3.2 Conceptual models

In this section the constructs, variables, and relationships to be studied are presented. The level of analysis is the group level since we are interested in the aggregated effects of judgement biases and information sharing on outcomes within the negotiating unit. The issue of aggregation and level of analysis will be dealt with in detail in Chapter 6.

In order to investigate the questions proposed above it is necessary to specify what types of outcomes should be measured, the intermediate variables that are most relevant for our investigation and the independent variables. The conceptual models represented in Figures 4 & 5 illustrate the relationships that will be studied.

Figure 4 Conceptual model I



We will begin by describing Figure 4 and the two research questions represented in this model. On the far right hand side of Model I is outcome. Quality outcomes in negotiations are often evaluated by their integrativeness (cf. Follet, 1925; Pruitt, 1983; and Thompson, 1991). Recall from Chapter 2 that the construct integrativeness is defined by the degree to which parties' interests can be reconciled (Pruitt, 1983). In the negotiation literature, integrativeness is often measured by an economic variable (cf. Thompson, 1990; and Tripp and Sondak, 1992) and represents the quantitative aspects of outcomes (Neale and Northcraft 1991; Thompson, 1990; and Tripp and Sondak, 1992). In Chapter 2 it was argued that in addition to the economic dimension of integrativeness there is also the social psychological dimension. A high quality outcome in a negotiation is defined as an integrative agreement and an integrative agreement contains both economic and social psychological dimensions. Consequently, we have both economic and social psychological outcome variables. Measurement and operationalisation of an integrative agreement will be detailed in Chapter 6.

The constructs identified as critical in the process, information exchange and judgement accuracy, are contained in the centre of the conceptual model. These constructs are related to integrative agreements, objective task complexity and the decision theory. The dimension of information exchange that is most relevant for the present study is the sharing of information that is related to the negotiators' interests. In the negotiation research exchanging information about the relative importance of the different issues has been connected to integrative agreements in both dyads and groups (Arunachalam and Dilla, 1995; Kimmel et al., 1980; Thompson and Hastie, 1990a; Thompson, 1991; and Thompson, et al. 1996). The construct information exchange will be represented by the variable *priority information exchange*. The variable *fixed pie error* (the more the error the less the accuracy) will depict the construct judgement accuracy. This construct is the absence of the fixed pie bias or accurate assessment of the other party's preference structure. Judgement accuracy regarding other negotiators' interests and priorities has also been linked to higher quality outcomes (Arunachalam and Dilla, 1995; Kimmel et al., 1980; Thompson and Hastie, 1990a; Thompson, 1991).

The second set of constructs is procedural structure, problem solving, and task requirements. Procedural structure will be defined by the variables: *agenda* and *degree of organisation*. Procedural structure (single or mutli-issue agenda) has been shown to influence both dyadic

and group negotiation outcomes (cf. Yukl et al. 1976; Mannix et al., 1989 and Weingart et al. 1993) and processes (Weingart et al. 1993).

Problem solving will be represented by the variable perception of problem solving. A problem solving approach reflects a strategy that involves concern for others and own interests and does not highlight the competitive aspects of negotiations (Pruitt and Lewis, 1975; and Walton and McKersie, 1965). Co-operative or problem solving approaches have been associated with information exchange and integrative outcomes (Pruitt and Carnevale, 1982 and Walton and McKersie, 1965). Our variable is rooted in the problem solving construct, however our main interest is in the negotiators' perception of the process. In other experiments problem solving orientation has been manipulated, but as an intermediate variable in the present study we seek to investigate the extent to which the individuals in the group saw the negotiation process as a problem solving activity

The task requirement construct is translated into the variable *trading issues*. As stated in Chapter 2 the type of task we use to test our hypotheses about integrative agreements restricts the techniques that can be used by the negotiators to reach integrative agreements. The simulation we will use requires logrolling. We need to check the degree to which dyads and groups directly employed this behaviour and to what extent it is related to other variables in the process.

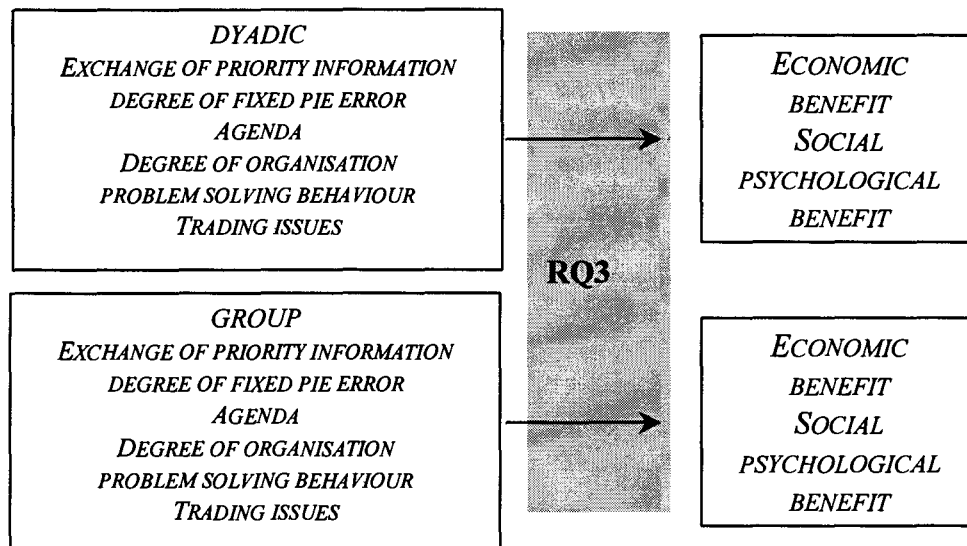
Finally, on the far left hand side of the conceptual model, the independent variables of people and issue complexity are located and are defined by the number of people with non-identical preferences and the number of issues. The independent variables are hypothesised to be related to the intermediate and outcome variables in this model. Since our main interests is people complexity we will only examine whether or not issue complexity within dyads and groups affects outcomes.

The model postulates that objective task complexity, determined by people (and issues), will have an effect on the intermediate variables and will have an effect on the negotiation outcome.

In Model II we examine more closely the similarities and differences between dyads and groups. We analyse two sub-samples, dyads and groups, and investigate which intermediate

variables affect outcomes in the sub-samples. The outcome variables remain the same, however the intermediate variables become the independent variables in the two sub-samples. Whether the intermediate variables that affect integrative agreements are the same in dyads and groups can be explored by examining dyads and groups separately.

Figure 5 Conceptual model II



In the next section we will present the research questions and hypotheses that are derived from our conceptual models.

3.3 Research questions and hypotheses

From the conceptual models we note that there are three relationships that need to be investigated.

1. Objective task complexity (people and then issue) on outcome.
2. Objective task complexity (people and then issue) on variables in the process.
3. Within dyads and groups - the relationship of the intermediate variables to outcome.

We will present the research question in the order of the relationships described.

3.3.1 Research Question 1

Do increases in objective task complexity cause decreases in the quality of outcomes in negotiation?

Examining figure 4 we note that RQ1 links complexity to outcomes. The main focus of this study is on people complexity. Consequently, the first part of the question is whether dyads perform better than groups on a negotiation, and the second part of the question is to determine the effects of issue complexity within groups and dyads

From the negotiation literature theoretically based arguments claim that it is more difficult for groups than for dyads to reach an integrative agreement. The mechanisms causing lower outcomes in group negotiations are postulated to be related to communication, co-ordination, coalition formation, information exchange, and judgement accuracy. In group negotiation, communication may be difficult because individual negotiators might not be given an opportunity to communicate their interests. Communication is also more difficult in group negotiations since messages sent to one party are also heard by others. Questions emerge. Does the right party get the right message? Does each party send the right messages to the right party? Listening is also more problematic in a group negotiation because two people can talk at the same time. Difficulties in communication can lead to groups not exchanging the appropriate information, misunderstanding the motives and intentions of the other parties, and misunderstanding the information exchanged (cf. Bazerman et al., 1988 and Kramer, 1991).

Co-ordination can be more difficult in groups than in dyads because of the number of parties that need to communicate, the number of issues, and the need for a decision rule (majority or unanimous) (cf. Bazerman et al., 1988 and Kramer, 1991). Empirical findings show that the decision rule chosen (Mannix et al., 1988) and the agenda in a group negotiation, affects outcomes. If co-ordination is more difficult to achieve in groups, the choice of the optimal procedure might also be more difficult and result in lower outcomes. Negotiators might also have difficulty in evaluating the concessions others negotiators have made (Winham, 1977). Kramer (1991) postulates that as the number of parties increases, co-operation decreases because individual negotiators may perceive less control over the process. In our investigation of groups, the task is structured so that majority rule is not feasible across issues, and coalitions cannot be formed. Although these mechanisms can lead to lower outcomes for groups, our interest is in *directly* comparing dyads and groups on similar tasks. Since majority decision rule and coalition formation are not possible in dyads, we excluded these mechanisms from analysis.

Complexity is said to affect information exchange and judgement accuracy, which in turn affects the negotiation outcome. These mechanisms will be examined directly in Research Question 2. As the number of people, with non-identical preferences increases, the information load increases, and information exchange regarding priorities is more difficult. Poor information exchange can lead to lower judgement accuracy. In the decision research, judgement biases have been directly related to the complexity of the task, and these biases can lead to sub-optimal outcomes. Objective task complexity has been defined by the number of alternatives, the number of attributes, time pressure, or as any increase in information load (Payne et al., 1993). As stated in Chapter 2, increases in people complexity increases the objective task complexity. As decision tasks become more complex people use simplifying strategies. Whether these simplifying strategies are effective or not depends on the how well the decision strategy matches the demands of the task. In a negotiation, we know that negotiators often employ a fixed pie simplifying strategy, which is associated with lower quality outcomes.

From the negotiation literature we know that increases in objective task complexity, defined by time pressure, in combination with an individualistic motivation orientation leads to lower quality outcomes (Carnevale and Lawler, 1987). These lower quality outcomes occur by inhibiting or constraining information exchange, lowering negotiator aspirations, and by reducing negotiator's flexibility hence making them less able to use trial and error methods. On average, across motivation orientation, high time pressure groups do not perform as well as low time pressure groups.

We also know from the negotiation literature (Bazerman and Neale, 1992; Carnevale and Lawler, 1987; Kramer, 1991) that outcome quality is predicted to decrease as people complexity increases. From the individual and group decision literature, (cf. Payne et al. 1993, and Parks and Cowlin, 1995), it is also contended that increases in information load can lead to lower quality outcomes.

In the current study, it is first necessary to determine whether people complexity affects the quality of negotiation outcomes. The mechanisms that lead to lower quality outcomes can include: difficulty in communication so that interests are not understood; co-ordination problems so that procedures chosen inhibit the parties from reaching integrative agreements; information exchange and lower judgement accuracy caused by the use of sub-optimal

decision strategies. These mechanisms will be examined in the subsequent research questions, however At this point it needs to be established whether or not people complexity affects integrative outcomes. Our first hypothesis is therefore:

H1: As people complexity increases, the quality of the negotiating unit's outcomes will decrease.

As stated in Chapter 2 quality outcomes have an economic and psychological component. The decrease in quality outcomes defined by economic measures is consistent with the negotiation literature. As the number of parties increases, the co-ordination, communication, and information exchange, become more difficult and judgement accuracy decreases, thus causing groups to reach economically less integrative agreements.

H1a: As people complexity increases, the negotiating unit's economic outcomes will decrease.

Although we have argued that integrative agreements comprise both objective economic dimensions and subjective dimensions, most research on integrative outcomes has only included the economic measures. Drawing from the negotiation theory on groups, and from the relationship between economic and social psychological outcome measures, we hypothesise that people complexity will have the same effect on the social psychological outcome as it has on the economic outcome.

As people complexity increases, it is more difficult to communicate, co-ordinate, exchange information and form accurate judgements. Kramer (1991) postulates that as the number of parties increases individual negotiators may perceive less control over the process. These mechanisms could lead to frustration and *lower satisfaction*. There is also empirical evidence that social psychological and economic outcome measures are highly correlated. Pinkley et al. (1995) found that the highest economic scoring negotiating units also reported significantly higher social psychological outcomes.

Based on the theoretical postulation regarding people complexity and satisfaction, and the relationship between the social psychological and economic dimensions of an integrative agreement, we hypothesise the following.

H1b: As people complexity increases the negotiating unit's social psychological outcomes will decrease.

The second set of hypotheses is related to issue complexity. As with people complexity, issue complexity is a specific type of objective task complexity. Using the findings from the decision literature, we know that as task complexity increases decision strategies change and decision outcomes are often become sub-optimal (c.f. Payne et al., 1993). Using the same logic as with people complexity, we assume that as the number of issues increases, economic outcomes will decrease. Most of the decision research focuses on rational decisions and discusses how decision strategies that deviate from rationality produce lower quality outcomes. In a negotiation task high economic outcomes are generally considered the most rational solutions (see Chapter 6 for a full discussion). The increased use of simplifying strategies, which are not rational, will lower economic outcomes.

Negotiation, decision, and cognitive theory predict that as the number of issues to negotiate increases, so does the difficulty for negotiators to *process all the information* and co-ordinate the process. The next set of hypotheses states that as issue complexity increases in dyads and groups, the quality of the economic (rational) outcome will decrease.

H1c: Within dyads, as issue complexity increases, economic outcomes will decrease.

H1d: Within groups, as issue complexity increases, economic outcomes will decrease.

For the social psychological outcome variable, the hypotheses are much more tentative. Based on the expected relationship between the economic and social psychological outcome variables, it is postulated that increases in complexity will lead to decreases in social psychological outcomes. It could also be argued that increases in objective task complexity could lead to frustration caused by the increased information processing demands. Kramer (1991) used similar arguments to discuss the effects of people complexity. We hypothesise the following:

H1e: Within dyads, as issue complexity increases, social psychological outcomes will decrease.

H1f: Within groups, as issue complexity increases, social psychological outcomes will decrease.

The next research question examines the intermediate variables presented in conceptual Model I.

3.3.2 Research Question 2

Do increases in objective task complexity affect the variables that emerge in the negotiation process?

Complexity is postulated to affect critical determinants of integrative agreements such as information exchange (cf. Kramer, 1991 and Parks and Cowlin, 1995), judgement accuracy (c.f. Bazerman et al. 1988, Thompson and Hastie, 1990) and the co-operation and problem solving behaviour in negotiations. Our first, and most important, group of hypotheses is focused on the people complexity dimension of objective task complexity.

Based on general negotiation theory, information that is important to integrative agreements is held to be more difficult to exchange in groups than in dyads. This difficulty arises from the volume of information, and the need to communicate with more than 1 person at a time (Bazerman et al. 1988 and Kramer, 1991). Other manipulations of task complexity (e.g. time pressure) also indicate that increases in complexity constrain information exchange (Carnevale and Lawler, 1987).

From the group decision literature there is research that suggests that as complexity increases groups are more likely to discuss shared (common among the decision members) rather than unique information (information held by only one member) (Parks and Cowlin, 1995). Work by Stasser and associates (Stasser, 1992; Stasser et al., 1989; and Stasser and Titus, 1985, 1987) demonstrates that group discussions in decision making tasks often revolve around information that is shared by members rather than on the unique information members hold.

An information sampling model is used to explain this occurrence. This model predicts that due to the proportion of shared versus unshared information, shared information has a sampling advantage over unshared information. Therefore, all other things being equal, group discussions will include more shared than unshared information. The repetition of information that all members share reflects an attempt to ensure that all group members understand a fact.

In a negotiation, the unique information that negotiators hold is the information about their priorities. Based on the empirical findings in the group decision research we assume that the likelihood of sharing priority information *decreases* as the number of parties involved in the negotiation increases.

H2a: As people complexity increases, priority information sharing will decrease.

The next hypothesis derived from our research question is related to judgement accuracy. Recall that judgement accuracy is defined by the accurate perception of the structure of the task. For the logrolling tasks often used in the negotiation research, this involves an accurate perception that parties have different priorities across issues. It is proposed that as the number of parties increase, it is more likely negotiators will use simplifying strategies.

From the negotiation literature, it is proposed that increases in information load lead to systematic errors in negotiator information processing (Bazerman et al., 1988 and Kramer, 1991). In the decision research, empirical studies illustrate that as task complexity increases people tend to use simplifying decision heuristics (Payne et al, 1993). A simplifying decision heuristic often found in negotiation is the fixed pie bias. Recall that a fixed pie bias occurs when people perceive a variable sum negotiation task to be fixed sum. To determine judgement accuracy in the negotiating unit we use the fixed pie variable. The presence of the bias indicates a decrease in judgement accuracy in the negotiating unit.

One final argument from the negotiation literature states that increased complexity in a group negotiation makes problem solving a more difficult strategy to implement than a distributive strategy. A distributive strategy leads to the use of the fixed pie bias and therefore lower judgement accuracy will be more prevalent in groups (Bazerman et al., 1988).

From this research we hypothesise the following:

H2b: As people complexity increases, fixed pie error will increase.

The third intermediate variable that will be examined is the degree of problem solving in the negotiation unit. From the negotiation theory it is claimed that co-operative behaviour will decrease in the negotiation as people complexity increases. This is because negotiators will perceive that they have less control over the process (Kramer, 1991) and because it is more difficult to problem solve than to compete (Bazerman et al., 1988).

H2c: As people complexity increases, problem solving behaviour will decrease in the negotiating unit.

The next set of hypotheses is related to issue complexity. Increases in issue complexity within the dyad and groups are proposed to have similar effects to increases in people

complexity on priority information exchange and the presence of the fixed pie error. Therefore, the arguments used for the effects of increases in people complexity are also used here to predict the effects of issue complexity. Increases in information load will restrict information exchange and increase the use of simplifying heuristics.

The more complexity, the more difficulties in information processing and thus more difficulties in information exchange (Carnevale and Lawler, 1987). Increases in issue complexity are predicted to decrease sharing of priority information in both groups and dyads. As mentioned previously, the group literature findings suggest that as information load increases mutual information rather than unique information is discussed (Stasser et al., 1989; Stasser and Titus, 1987 & Parks and Cowlin, 1995).

H2d: As issue complexity increases within dyads, priority information sharing will decrease.

H2e: As issue complexity increases within groups, priority information sharing will decrease.

Judgement accuracy will also decrease as issue complexity increases due to difficulties with information processing (Bazerman et al., 1988; Kramer, 1991 and Payne et al, 1993).

H2f: As issue complexity increases within dyads fixed pie error will increase.

H2g: As issue complexity increases within groups fixed pie error will increase.

3.3.3 Research Question 3

Do the intermediate variables that lead to high quality outcomes differ between groups and dyads?

The last relationship of interest, illustrated in figure 5, is the one between the variables in the process and high quality outcomes in dyads and groups. The negotiation literature has discussed how complexity influences the processes and outcomes in a negotiation, however no empirical investigation has examined whether the central variables within the process are differentially important for groups and dyads. Few studies have directly compared group and dyadic negotiation and therefore this final RQ3 is more explorative in nature than the other research questions.

What we do know about dyads and groups is that the structure of the process, and judgement accuracy seem important in both contexts (cf. Arunachalam and Dilla, 1995, Thompson and

Hastie, 19990a, Weingart, et al., 1993, and Yukl et al., 1976). However, Bazerman et al. (1988), propose that procedural structure is more important in groups than in dyads. They claim, that due to the increase in co-ordination demands and the difficulties in communication, the way in which the group decides to structure the process will affect integrative outcomes. In a dyadic negotiation it is simpler to co-ordinate action since there are only two parties. No decision rules are necessary, and communication is direct and towards the party it is intended for. In order to ensure that all negotiators in a group are able to communicate and understand one another's interests, the degree and type of procedural structure they decide on will be more important for outcomes than for dyads. Due to the tentative nature of the hypothesis and the theory it is drawn from only the economic dimension of an integrative agreement will be examined here. We therefore hypothesise the following:

H3a: Procedural structure will be more important for groups to achieve high economic outcomes than for dyads.

By examining the intermediate variables in dyadic and group negotiation, we can test if variables that are important for dyadic outcomes are as important for group outcomes. There is some theory and empirical evidence that would suggest that indirect information sharing will be more important for groups to reach an integrative outcome (defined by economic outcomes), whereas direct information sharing is more important for dyads (Weingart et al., 1993). The reason given is that other mechanisms such as reciprocity and trust are more important for achieving integrative agreements in groups due to the greater amount of information (Weingart et al., 1993). The following hypothesis should be viewed as largely tentative as the empirical research by Weingart et al., (1993) was explorative.

H3b: Information sharing about priorities will be less important for groups to achieve high economic outcomes than for dyads.

In general, differences between groups and dyads have been detected regarding the effect of orientation (Shapiro and Rognes, 1996 and Weingart et al., 1993), correlation of judgement biases (Arunachalam and Dilla, 1995), and in terms of the importance of information exchange (Weingart et al., 1993). From these empirical findings, there is a strong indication that the intermediate variables we are studying will have different effects on outcomes in dyads and groups. We might postulate, for example, that since judgement accuracy is

correlated to outcomes in both dyads and groups (cf. Thompson and Hastie, 1990a and Arunachalam and Dilla, 1995), that it is equally important for groups and dyads. This might not be the correct assumption. Based on the scant amount of research directly comparing dyads and groups, and specifically the paucity of research illustrating a causal connection between the intermediate and outcome variables for dyads and groups, our final hypothesis is general and non-directional.

H3c: Intermediate variables that lead to high quality outcomes will differ between groups and dyads.

3.4 Summary

We have presented 3 research questions based on a review of the existing research. Our first 2 research questions contain directional hypotheses since we can draw on the negotiation and decision research to predict how complexity will impact the variables in the process and the outcomes of a negotiation. However, for the last research question, the hypotheses must be viewed as tentative since both theory and empirical evidence is scant.

The hypotheses in this chapter have been put forward to test the model that complexity affects negotiation outcomes, and that the 2 central intermediate variables (information exchange and judgement accuracy) affect negotiation outcomes. In addition, the aim of our investigation is to discover the similarities and differences between dyads and groups in the determinants of integrative agreements. In the next chapter we will describe the type of research design chosen to answer these questions and in Chapter 5 and 6, the instruments used to measure these variables.

CHAPTER 4

RESEARCH DESIGN

The goal in this chapter is to present a research design that can answer the questions and hypotheses introduced in Chapter 3. This chapter will begin with an analysis of the type of question we are asking (4.1) and then in section (4.2) we will describe different types of research designs. Finally, we will present the design we chose and a brief summary (4.3).

4.1 Components of the research question

We have three research questions examining the differences between dyadic and group negotiation and all three questions are causal.

RQ1: Do increases in objective task complexity cause decreases in the quality of outcomes in a negotiation?

RQ2: Do increases in objective task complexity affect the variables that emerge in the negotiation process?

RQ3: Do the intermediate variables that lead to high quality outcomes differ between groups and dyads?

In this section we will introduce the components of a research question and then discuss the concept of causality. Variables, relations among the variables, and hypotheses are elements of a research question. In the social sciences we can classify the types of questions being asked into two broad categories: descriptive and causal. Descriptive questions let us explore relationships between variables only specifying covariation. With causal questions we want to discover the effects of one variable on another and this requires specification of independent and dependent variables, clarification of the relations between the independent and dependent variables, and the tentative answer to our research question in the form of hypotheses.

The demonstration of causality requires three separate operations: (1) that covariation exists between the independent and dependent variables, (2) spurious relations are removed, and (3) that the independent variable occurs before the dependent variable (time order) (Nachmias and Nachmias, 1981).

In order to ask causal questions we need to ensure that we have information about the variables, relations among the variables, and hypotheses. From the review of the negotiation research, virtually no empirical studies have directly compared the similarities and differences between dyadic and group negotiation. The negotiation theory, however, has provided clear relationships and distinctions between independent and dependent variables. From the theory hypotheses concerning likely differences between dyads and groups, with regard to outcomes and variables in the process, were possible.

Although research question 3 is not directional, a causal relationship is postulated: people complexity affects the degree to which certain intermediate variables affect outcomes. All the hypotheses in Chapter 3 attribute any observed differences found in the intermediate or dependent variables to objective task complexity (defined by people or issues) and not to other variables.

Given the causal nature of our questions a design that maximises our ability to draw causal inferences needs to be chosen. In the next section we define a research design and describe the design that allows us to answer causal questions.

4.2 Research Design

A research design is the blueprint for a study that directs the collection and analysis of the data (Churchill, 1987). Scientific research designs vary in their ability to ascertain whether a causal relationship exists between the independent and dependent variables or not (internal validity). Research designs also vary in their efficiency, demands on the researcher or the subject population, and the time they take to implement (Judd et al., 1991). Three major types of designs exist: experimental, quasi-experimental designs and pre-experimental.

Experimental designs require that the units of analysis be randomly assigned to the experimental and control groups. This design allows for comparisons, spurious relationships to be controlled, manipulation of the independent variable, and in most cases generalisations to be made (Nachmias and Nachmias, 1981). An experimental design maximises internal validity through control and by removing potentially confounding effects through randomisation. This design ensures that the three components necessary for causal inferences

can be ascertained: the cause precedes the effect, the cause and effect covary, and the elimination of spurious correlations.

Quasi-experiments often contain some of these components but not all of them. Often quasi-experimental designs are used when manipulation and randomisation are not possible. Pre-experimental designs are designs in which causal inference is almost impossible to ascertain since these designs cannot rule out the threats to internal validity.

A research design is a framework for data collection and analysis and enables the research question to be answered. Generally experimental designs are regarded as more powerful than non-experimental designs in uncovering causal relationships (Spector, 1981) and they are considered the strongest model of logical proof (Nachmias and Nachmias, 1981). Therefore, providing that the research question is well constructed and causal, the experimental design is considered the strongest research design. Examining the negotiation and behavioural decision literature we note that many studies use laboratory experiments, (cf. Harris, 1990 and Payne et al. 1993) including those empirical studies most relevant to our research (e.g. Arunachalam and Dilla, 1995; Biggs, 1985; Carnevale and Lawler, 1987; Lussier, 1979; Olshavsky, 1979; Parks and Cowlin, 1995; Payne, 1976; Pruitt and Lewis, 1975; Thompson, 1991; Thompson, et al., 1996; Weingart et al. 1993, and Yukl et al. 1976). Consistent with the research questions and the research designs of current studies, an experimental design was chosen.

With research questions 1 and 2, the independent and dependent variables are clearly delineated. The independent variable objective task complexity (people and issue complexity) is easily manipulable. Simply increasing the number of people with non-identical preferences participating in the negotiation and/or the number of issues, the research hypotheses are specific and amenable to testing. Time order of the variables is ensured and subjects can be randomly assigned to conditions. For research questions 3 the independent and dependent variables can be specified, the time order of the relationship determined, however we are not able to randomly assign subjects to different levels of the intermediate variables (although we have randomly assigned them to group and dyadic conditions). In research question 3 we are examining the interaction of people complexity and the intermediate variables. The intermediate variables are treated as independent variables and we are unable to randomly assign negotiating units to different levels of these variables.

Therefore the research design for our third research question is determined by the first two research questions, and the design for this question is not strictly experimental.

4.3 Type of experimental design chosen.

For research questions 1&2 the experimental design chosen is a *post-test-only control group between subject design*. The decision criteria used to choose among different designs were related to efficiency, time, and demands on the subjects. The designs available differ in terms of the number of variables, manipulations, control groups, and pre and post-tests given. The goal of an experimental design is to eliminate threats to internal validity. A *post-test only* design fulfils these criteria and at the same time minimises the demands on the subjects and the researcher, and is more efficient and less time consuming than other experimental designs such as the *True experimental design* or the *Solomon four group design*.

All experimental designs require random assignment of subjects to experimental conditions. In table 3 the main independent variable, people complexity, and the dependent variables (negotiation outcome and the intermediate variables) are illustrated. The *R* in table 3 indicates random assignment of subjects to either the dyad or group condition. Within dyads and groups *another post-test-only design* was chosen where the treatment effect was high or low information conditions. We chose a between subjects design so that learning effects of subjects participating in more than 1 negotiation would be eliminated. We also chose to examine issue complexity within groups and dyads for because our main focus is on people complexity. By having two tasks the effects of people complexity across different tasks can be examined. The hypotheses regarding increases in issue complexity (number of issues) apply only within dyads and groups.

Table 3 *Post-test-only* experimental research design.

		Negotiation outcome and the intermediate variables
<i>R</i>	<i>DYADS</i>	<i>O₁</i>
<i>R</i>	<i>GROUPS</i>	<i>O₂</i>

Research question 3 is embedded within the experiment. In this research question dyads and groups provide the context for investigation and the intermediate variables (which were observed, not manipulated) become the independent variables. The result is we cannot randomly assign the units of analysis to varying levels of the intermediate variables. Both dyads and groups will receive the same negotiation tasks, and consequently differences in the process-outcomes relationship can be attributed to our manipulation (people complexity). However, there is potential that other intermediate variables beyond the ones in our study are interacting with the context (dyadic and group) and our intermediate variables. This could lead to spurious correlations. In the present study we have attempted to include the intermediate variables found to be significant in the literature for both dyadic and group outcomes. Multivariate data analysis, which allows us to approximate the *Post-test only control group* design (Nachmias and Nachmias, 1981), will also be used. In research question 3 we examine which differences exist between groups and dyads in their process-outcome relationships and examine all the intermediate variables for potential differences. In table 4 we present the research design.

Table 4 Research design for Research question 3

Context	Independent variables	Negotiation outcome
<i>Dyad</i>	Exchange of priority information Degree of fixed pie error Agenda Degree of organisation Problem solving behaviour Trading issues	<i>O₁</i>
<i>Group</i>	Exchange of priority information Degree of fixed pie error Agenda Degree of organisation Problem solving behaviour Trading issues	<i>O₂</i>

In this section we have outlined the research design chosen for our investigation. Our first two research questions can be answered with a *post-test only experimental design*. For research question 3, to observe the intermediate variables that emerged and their relation to outcomes, a pure experimental design was not possible. However, the design used for RQ3 approximates a *post-test only experimental design*.

Our aim with all three research questions is to maximise internal validity so that we are able to make causal inferences and this was achieved through an experimental research design

which allowed for comparisons (dyads and groups), manipulation (objective task complexity) and control. In the next section we will discuss external validity and the research setting.

4.4 Research setting

In the previous section we discussed maximising internal validity and control. This remains our main goal, however issues regarding external validity need to be discussed. In this section we present our chosen research setting, then issues of generalisability, and respondent selection.

Choosing a research setting is influenced by the goals of the research and by previous studies. Our argument has been that the research questions are causal in nature, and therefore to answer them accurately we need a design that ensures that causality can be determined. Our first conclusion is that we need an experimental design to maximise internal validity. Now it is necessary to decide between the two basic types of research settings, laboratory or field. The most controlled method for obtaining data is the laboratory setting which controls for intrinsic and extrinsic factors (Judd et al., 1991). A field setting experiment takes place in a natural situation and the same control cannot be maintained. A laboratory setting was chosen.

The interest in this study is to test theory and therefore a laboratory experiment was chosen. The goal in this dissertation is not to generalise the results to a real world situation but to test the theoretical propositions put forward in the literature. The question we are asking is whether the hypothesised relationships can be demonstrated, not whether they occur in a specific real world situation. Do dyadic and group negotiations differ? From the nature of our research questions, and the need to maximise internal validity a laboratory experiment is the most suitable choice.

External validity refers to the degree to which we generalise from our study. However, generalisation has two forms: generalisability of effects and theory (Calder, Phillips, and Tybout, 1981). Effects application has the goal of generalising findings beyond the research setting to specific real world events. Theory application relies on scientific theory to explain events beyond the research setting. For example, our main interest is not to parallel events in the real world but to maximise construct validity so that our theoretical explanations can be

generalised i.e. dyadic and group negotiation differs. In this way can gain ideas about potential interventions to aid negotiators.

The trade off between external and internal validity, which is often discussed in the literature, is only applicable if the goal of the research is to generalise to a particular setting. Under these circumstances the requirement for control makes mirroring real world events difficult. With theory application this concern, with paralleling real world settings, is inappropriate and external validity is evaluated by the generalisability of explanations not effects (Calder et al. 1981).

The role of laboratory experiments in the negotiation literature is extensive (Arunachalam and Dilla, 1995; Carnevale and Lawler, 1987; Pruitt and Lewis, 1975; Thompson, 1991; Thompson, et al., 1996; Weingart et al. 1993, and Yukl et al. 1976). By choosing this type of design our research questions are answered and our study is consistent with the existing negotiation literature.

The next component of the design is the choice of subjects for the study. The goal in this study is to generalise explanations and therefore the sample of subjects required can be an arbitrary group from the general universe of people (Judd et al., 1991). To generalise explanations it is recommended to achieve maximally homogenous respondents (Calder et al. 1981). With these parameters it is possible to use students as such a group.

In this sections we have argued for using a laboratory experiment and claimed that using students as the subjects in this type of experiment is not only acceptable but appropriate provided they are maximally homogenous

4.5 Summary and caveats

In this chapter we have described our research design, our respondents, and our intentions for generalisation. We have concluded with a *post-test only experimental between subjects design*, in a laboratory setting, using a homogeneous sample as most appropriate to test our hypotheses. Although laboratory experiments have been criticised for being artificial, the comments are often incorrect if the goal of the research is to test theory (Calder et al., 1981). Because we are testing theory we want to implement the strictest possible test of this theory and this requires maximum control, which is achieved with a laboratory experiment.

However, what we can ask ourselves with these research choices is whether we are investigating the most important dimensions of negotiations? Can we use this research to form the basis of intervention in an applied setting? Many researchers argue that key dimensions of a negotiation cannot be captured in laboratory experiments, such as long-term relationships, and the social context (Greenhalgh and Chapman, 1995). We do not dispute these observations. However, it can be argued that at the theory testing stage the control afforded by laboratory experiments is required. The lack of research directly comparing dyadic and group negotiation indicates that the present study is at the theory testing stage. It should also be noted that studies have shown that the findings from laboratory research using student samples are applicable to experts in the field (Neale and Northcraft, 1986).

Although we must understand the limits of laboratory research we believe that the current design matches our goals, the type of questions we have asked, and is consistent with the methods used for understanding negotiations.

In the next chapter (5) we present the task we used in our laboratory experiments to simulate the principal dimensions of negotiation. In Chapter 6 the measurement and procedures in this study will be introduced.

CHAPTER 5

INSTRUMENTATION: TASK DESIGN

In this chapter we will present the task designed to examine our research hypotheses. Due to the nature of our question, and the extant negotiation research we chose to use a simulated negotiation task. The existing negotiation tasks do not allow for a direct comparison between dyads and groups and therefore a new task had to be designed. In this chapter the task designed for the current study is introduced.

The chapter begins with general arguments for using a simulated negotiation task (section 5.1) and then continues with a review of the traditional simulations used in the negotiation research (section 5.2). In section (5.3) the negotiation tasks developed for group simulations are presented and compared. In section (5.4) the task designed for the current investigation is introduced. In section (5.5) we conclude that a simulation is the appropriate measurement tool, and that our new task is structurally similar to existing negotiation simulations and capable of answering our research question.

5.1 Why simulation?

The present study needs to use a negotiation simulation in order to answer the research questions properly. Recall from Chapter 4 the necessity of using an experimental design to answer our research questions. Experimental designs require control over the independent variables so that a cause effect relationship can be determined, and the effects of extraneous variables can be eliminated or at least mitigated. Conducting our research in a laboratory setting increases our ability to control for these factors and in a laboratory setting it is common practice to use simulations rather than generate a real negotiation. Furthermore, our research questions require that the complexity of the task be manipulated. To accomplish this, with maximum control, the task itself must be designed. Given our research question, the advantages of using a laboratory setting, and the need to compare different levels

of complexity, a simulated negotiation task appeared to be the best instrument for our investigation.

What is a simulated negotiation task? A simulated negotiation task imitates key characteristics of a real negotiation so that negotiation behaviour can be studied in an experimental situation. Recall that a negotiation is considered a subtype of the more general category of mixed-motive tasks (McGrath, 1984). Experimental simulations have been developed to examine three broad categories of mixed-motive tasks: coalition, dilemma, and negotiation (McGrath, 1984). Coalition tasks involve groups where there exists parties with conflicting interests and there exists the possibility of agreement among a subset of members who can then allocate pay-offs to themselves (cf. Murnighan, 1978 & 1985). Dilemma simulations, most notably the prisoner's dilemma game, involve presenting subjects with a matrix of the pay-offs associated with usually two different choices. The pay-offs for each choice are dependent on the choices made by the other player. Choices are made without the players interacting. These mathematical games have been used in economic theory to develop normative solutions and have also been used in social psychological experiments to describe how people behave when confronted with such a dilemma.

The final category of simulations, negotiations, involve parties who are given a set of preferences (translated into numeric values), do not know other party's preferences or joint outcomes possible, and are instructed to resolve differences and agree upon an outcome. The negotiation simulations that are dominant the literature are based on the task developed by Kelley (1966) and Pruitt and Lewis (1975). This task contains two or more issues of different priority to the parties negotiating, and therefore allows for parties to logroll the issues (trade issues of differing priorities) to achieve integrative agreements. Simulations modelling mixed-motive behaviour include those for dyads (cf. Kelley, 1966; Kimmel et al. 1980; and Pruitt and Lewis, 1975; Thompson and Hastie, 1990a) and groups (Arunachalam and Dilla, 1995; Mannix et al., 1989; Thompson et al. 1988, and Weingart et al., 1993); and those that include no communication (PD) to interaction (Kelley, 1966); and those that range from abstractness (PD) to realism (Greenhalgh and Neslin, 1983). The type of simulation of interest in our study is one in which dyads and groups can be compared, interaction

is allowed, coalitions cannot be formed, and realism is incorporated. Further explanations about these choices will be given in section (5.4)

The advantages and disadvantages of using a simulation are similar to the benefits and costs of using laboratory over field setting experiments. Many of these issues have been covered in Chapter 4 and therefore only issues directly concerned with the simulation itself will be presented in this section.

The role of simulation in negotiation research has a long history dating from Kelley (1966) to present day. Simulations continue to be one of the dominant approaches in experimental studies of negotiations. Advantages of using this type of simulation are:

1. Findings from the present study can be incorporated into the existing body of knowledge derived from this methodology.
2. Outcomes can be evaluated using economic theory.
3. Research based on simulations can be used to prescribe negotiation behaviour in real world settings (Harris, 1990; Neale and Northcraft, 1986 & 1990).
4. The research questions in this study can be answered.

Problems arising from the use of simulations are:

1. Assigning preferences and assuming linear utilities (Northcraft et al. 1995).
2. Exclusively investigating logrolling tasks for understanding integrative outcomes (see section 2.5).
3. Excluding the role of relationships in negotiations (Greenhalgh and Chapman, 1995).
4. Artificiality.
5. Assuming that what takes place at the negotiation table is the most important aspect of negotiations (Lewicki et al., 1992).

With every choice in the research process there is a trade off. Even with the potential difficulties described above it was reasoned that an experimental simulation was most appropriate for answering our research question. The problems actually encountered in the current study, associated with the simulation developed, will be discussed in Chapter 10. We conclude that a negotiation simulation is the most appropriate method to use for the present study. In the next section we will outline the original negotiation simulation developed by Kelley (1966) from which we have developed the negotiation task for our study.

5.2 Traditional simulation: Kelley's negotiation task

The majority of laboratory experiments investigating negotiations and integrative agreements have used a negotiation task created by Kelley (1966) and developed by Pruitt and Lewis (1975) (Carnevale and Pruitt, 1992). In this section the original simulation task will be outlined with the purpose of giving the conceptual and structural background for the task we developed to study our research question. What dimensions of the negotiation were simulated in Kelley's task?

The task Kelley (1966) developed models the interaction between buyer and seller in a wholesale market. In the task two subjects must agree on the prices for three appliances (television sets, typewriters and vacuums). Each participant is given a sheet displaying the dollar profits achieved at each price (A-I) of the good (see table 5 below).

Table 5 Kelley's negotiation task

<i>SELLER</i>						<i>BUYER</i>					
<i>Television sets</i>		<i>Vacuum</i>		<i>Typewriters</i>		<i>Television sets</i>		<i>Vacuum</i>		<i>Typewriters</i>	
<i>Price</i>	<i>Profit</i>	<i>Price</i>	<i>Profit</i>	<i>Price</i>	<i>Profit</i>	<i>Price</i>	<i>Profit</i>	<i>Price</i>	<i>Profit</i>	<i>Price</i>	<i>Profit</i>
A	\$0	A	\$0	A	\$0	A	\$4000	A	\$2400	A	\$1600
B	\$200	B	\$300	B	\$500	B	\$3500	B	\$2100	B	\$1400
C	\$400	C	\$600	C	\$1000	C	\$3000	C	\$1800	C	\$1200
D	\$600	D	\$900	D	\$1500	D	\$2500	D	\$1500	D	\$1000
E	\$800	E	\$1200	E	\$2000	E	\$2000	E	\$1200	E	\$800
F	\$1000	F	\$1500	F	\$2500	F	\$1500	F	\$900	F	\$600
G	\$1200	G	\$1800	G	\$3000	G	\$1000	G	\$600	G	\$400
H	\$1400	H	\$2100	H	\$3500	H	\$500	H	\$300	H	\$200
I	\$1600	I	\$2400	I	\$4000	I	\$0	I	\$0	I	\$0

The issues (the appliances) are of differing priority to the subjects (television sets are of greater importance for the buyer - \$4000 and typewriters are of greater importance to the seller - \$4000). The highest joint profit (often defined as the integrative solution) can be achieved by trading these issues (logrolling) so that the buyer gets price A on televisions and the seller gets price I on the typewriters. The vacuum issue is a distributive issue since the parties have the same priorities and cannot trade on

that issue. A compromise agreement can be conceptualised as E-E-E with a joint profit of \$8,000. An agreement of \$10,400, the highest joint profit, could be A-(E)-I. The joint profit is then used to calculate the integrativeness of the agreement (Pruitt and Carnevale, 1982).

Kelley's task simulates several features of a negotiation: mixed-motive orientation; partially conflicting interests (preferences), and the context of a negotiation (buyer seller relationship). The structure of the task includes: two integrative issues, one distributive issue; symmetrical payoff structure (both parties can potentially earn the same amount of profit); and nine alternatives for each appliance (issue). The structure of this task enables the bargaining zone to be determined and quantified so that outcomes can be mapped out analysed. The two integrative issues make logrolling possible and integrative agreements can be measured.

In summary, the task designed by Kelley (1966) gives utilities (represented by profits) to the two negotiating parties and allows for calculation of their joint benefit. By using this task outcomes can be quantified, and economic measures can be used to assess the agreement quality. This simulation captures the mixed-motive dimension of negotiation and provides quantifiable outcomes. Over the years researchers have continued to use the basic structure of this task to study negotiations.

In the next section a comparison between the negotiation tasks used to study groups and Kelley's original simulation will be described. This comparison will isolate important dimensions that need to be included in a simulation that is equivalent for dyads and groups.

5.3 Group tasks

Kelley's task was designed for two parties, however recent interest in group negotiations has led to adaptation of this simulation. Before describing the task developed for the present study we will review the dimensions of Kelley's task that have been altered for the study of groups.

Group negotiation tasks that are based on Kelley's (1966) structure, have changed some structural aspects such as, the number of alternatives, the symmetric structure of

the task, the number of issues, and the realism. In table 6 the group tasks used in different studies and Kelley's' task are compared on several dimensions.

Table 6 Structural dimensions of Kelley's task and the adapted group negotiating tasks

	Kelley (1966)	Mannix et al. (1989)	Thompson et al. (1988)	Weingart et al. (1993)	Arumchalam and Dills (1995)
Structural Dimensions					
number of parties	2	3	3	4	3
number of issues	3	3	3	5	4
number of alternatives	9	5	3	5	5
integrative issues	2	3	3	5	3
distributive issue(s)	1	0	0	0	0
compatible issue-all parties	0	0	0	0	1
symmetric profit schedule	yes	yes	yes	no	yes
stable coalitions across issues	no	no	no	no	no
number of trades	1	1	1	1-2	1

^a A *purely* distributive issue refers to an issue which, no matter which alternative within that issue is chosen, the joint sum will stay the same for the group (resources are fixed and need to be allocated).

The dimensions in the table 6 are straightforward and refer to structural components of the simulations. When designing the simulation for the present study we have three goals: to keep the simulation similar to the existing tasks, to better our simulation in terms of realism and context, and most importantly, to have a task that is comparable across varying levels of complexity. A brief description of the dimensions found in the table will be given before presenting our evaluations and then our choices.

The first dimension refers to the number of parties participating in the negotiation and this has ranged from 2-4. The second dimension refers to the number of issues negotiators had to agree on (ranging from 3-5). The next dimension is the number of alternatives within each issue in the negotiation, which has included (3-9). We note that the information load has varied between the studies in terms of the number of parties, the number of issues, and the number of alternatives.

The next 3 dimensions refer to the *type* of issues contained in the simulation. Dimension four in the table, integrative issues, indicates the number of issues in the negotiation that can be traded to achieve high joint profit. Individually, an integrative

issue can be treated in a distributive manner, however if parties recognise they have differing priorities then trade offs among issues are possible. In a simulation a minimum of 2 integrative issues is required to make integrative agreements possible, i.e. subjects must be able to logroll. The distributive issue is one in which a trade off on other issues is not possible. Distributive issues do not alter the overall joint profit in the simulation and therefore the amount the negotiating unit can earn on that issue is fixed. With a distributive issue the parties allocate the profit among themselves. The third type of issue found in the group tasks is called a compatible issue. Compatible issues are issues in which all players have the same preferences for the alternatives on a particular issue. These issues can alter the overall joint profit.

The group simulations averaged 3 integrative issues and no distributive issues compared to Kelley's task. Only 1 group negotiation had a compatible issue, which differentiates it from Kelley's task and the other group tasks.

When payoff schedules in a negotiation simulation are identical for the different parties (in terms of potential profit and structure), except that each party has different priorities across issues, the schedule is said to be symmetric. For example in Kelley's game (table 5) each party could potentially earn the same amount of profit and the structure of their payoffs are the same although the goods that earn them the most profit differ. Only one task did not have a symmetric structure and the reasoning was that subjects found a symmetric structure made trade offs too easy (Weingart et al., 1993). Other studies have not reported this problem.

Stable coalitions (dimension 8) refer to the ability of parties to form stable coalitions across issues. This could obviously not occur in a dyad and in the group simulations preference structures did not allow for 2 or more members to agree on every issue. Although in some of the group negotiation tasks a subset of parties could form coalitions on individual issues, they could not do this *across* issues. The group negotiation simulations presented in table 6 do not include the coalition simulations described in section (5.1).

Finally, dimension 9 describes the number of trades an individual participant had to make to reach an integrative solution. The number of trades is a function of the

number of issues, the number of parties, the structure of the task and also, reflects the difficulty of the task. In the simulations presented above the most usual structure is that each participant must trade off 1 issue in order for the negotiating unit to reach the highest quality outcome.

In this section Kelley's (1966) dyadic negotiation task has been compared to the negotiation tasks developed for groups. Through examination of the tasks we can conclude that all the group negotiation tasks reported above include the key task characteristics of the original simulation created by Kelley: the mixed-motive component, the possibility for logrolling, and the pay off schedules that represent linear utilities. The deviations from Kelley's task, such as the number of parties, and either the number or the type of issues, could not be avoided when altering the simulations to accommodate for more parties. However some changes were motivated by the subjects used or by the research questions. Weingart et al. (1993) changed the task so that payoff schedules were asymmetric. This change was based on their pre-testing and their subjects. The introduction of compatible issues by Arunachalam and Dilla (1995) study was necessitated by their research question. It should be noted this alteration has also been made in the dyadic research (Thompson and Hastie, 1990a).

One change, however, that does differentiate the group tasks from Kelley's, is that the group simulations do not include a purely distributive issue. We define purely distributive in terms of all parties want the resource with equally high preferences. In previous research distributive issues have been used to study individual scores and differences between individual scores. The role of distributive issues will be discussed in Chapter 6 when we present our dependent variable, at this point it is only important to note the difference.

From our review we found no systematic comparisons of how group tasks were similar or dissimilar from other dyadic simulations although similarity was often claimed (Mannix et al., 1989, and Thompson et al. 1988). In addition, no research was found that used the same or very similar task for both dyads and groups.

In this section the original dyadic logrolling task was reviewed and similar simulations used to study groups have been presented. In the next section the task designed for the present study, and its similarity to Kelley's and the other group simulations, is introduced.

5.4 Negotiation tasks for dyads and groups

In designing the simulation for the present study three goals needed to be met: to keep the simulation similar to the existing tasks, to better our simulation in terms of realism and context, and most importantly, have a task that is comparable across varying levels of complexity. In this section the negotiation task designed for this study will be presented. In order to answer our research question the negotiation task had to be adaptable to the different levels of complexity. It was therefore necessary to develop four tasks that were as similar as possible. In this section we first describe general structural decisions with reference to our main research questions: comparing dyads and groups and varying the number of issues within dyads, and groups and then we discuss in more detail the negotiation tasks constructed.

Recall from Chapter 3 that our main focus is to compare dyads and groups and our secondary interest is to examine the effects of increases in issue complexity within dyads and groups. To address our first interest, a comparison of dyads and groups, a dyadic negotiation was created that could be extended to include more parties and more issues.

The minimum number of people possible to keep the structure of the task similar for dyads and groups was 4 and the minimum number of issues was 4. Beginning with the logic that in a negotiation simulation with integrative potential at least 2 issues are required for 2 people so that parties can trade issues of varying priority. It then follows (given that parties have non-identical interests, coalitions are not possible and parties have symmetric pay-off matrices) that at least 3 issues are required for 3 parties, and 4 issues for 4 parties.

Based on the above rationale, the minimum number of people required for a group simulation, so that the same type and number of issues is used for dyads and groups,

is 4. To keep the task simple we did not want to increase the number of issues beyond 4 and therefore we only had integrative type issues (all issues could be traded). The decision to use only integrative issues is similar to the other group tasks, and using 4 issues is within the normal number of issues dealt with in dyadic and group negotiations. We also decided to have the same number and structure of alternatives on each issue as Kelley's (1966) game. This decision was based on maintaining the comparability with the original task, allowing for many possible outcomes to secure variation, and ensuring that the dyadic task would not be too simple.

In order to examine the effects of increases in issue complexity within dyads and groups two other simulations were created. In order to increase the issue complexity within dyads and groups the basic dyadic negotiation was doubled from 4 integrative to 8 integrative issues (same preference structure) with two distributive issues added. By reviewing the number of issues in most dyadic negotiation simulations (3-5 on average) and the group negotiation simulations (3-5), 10 issues exceeded the usual issue complexity in previous simulations. In addition, our own pre-testing of the task revealed that issue complexity was regarded as much higher when negotiating 10 rather than 4 issues. The high issue complexity condition tasks of 10 issues, had marginally different outcome structures due to the addition of the distributive issues. Our goal with the high issue complexity tasks was threefold: to substantially increase the amount of information from the low issue complexity condition; to alter the structure of the task so that we could examine if differences between dyads and groups occurred across tasks; and to incorporate distributive issues into the task to make it more similar to the original Kelley (1966) simulation. In table 7 the 4 tasks are outlined.

Four tasks were developed so that dyads and groups could be compared. All the low issue complexity tasks in both dyads and groups have the same four issues, the same alternatives and the only difference is that 2 parties are added to the negotiation. The high issue complexity tasks include these same 4 issues, plus an additional 4 issues (with same preference structure as the original 4) and two purely distributive issues in which each party has a different priority on one issue that cannot be traded.

Table 7 Dimensions for task development

	Low issue complexity	High issue complexity
Dyad	2 parties 4 issues (integrative)	2 parties 10 issues (8 integrative & 2 distributive)
Group	4 parties 4 issues (integrative)	4 parties 10 issues (8 integrative & 2 distributive)

The tasks have been described in terms of the number of parties, the number of issues, and the types of issues. We will now examine other dimensions of the negotiation task and the decisions we made in our design regarding the symmetry of preference structures, possibility of coalitions, number of trades, the realism, and the context of the negotiation.

The symmetrical structure of the negotiation simulation was maintained in order to be consistent with the dyadic negotiation simulations and the majority of the group simulations. Weingart et al. (1993) created an asymmetrical profit schedule based on pre-testing and argued that symmetrical structures made the simulation too easy for their subjects to trade off issues. Pre-tests of our task did not reveal that the symmetrical structure made the simulation too easy.

In order to ensure the comparability of dyads and groups we designed the task so that no coalitions could be formed either within single issues or across issues. Although in the other group simulations no stable coalitions are possible across issues, it was possible for example, for 2 of the 3 parties to form a coalition within an issue. Based on the design of our task and the even number of parties, this was not possible in our simulation. Since coalitions of any kind are not possible in a dyads it was necessary to ensure that they were not possible in the group negotiation.

Recall that integrative issues require trade offs to be made. In our tasks the number of trades each player had to make to reach the highest quality outcome is 2 on the dyadic low issue complexity task; 1 on the group low issue complexity task; 4 on the dyadic high issue complexity task; and, 2 on the dyadic high issue complexity task. This

structural difference between dyads and groups was necessary in order to ensure similarity on the other dimensions.

Two final considerations in the construction of the simulation were the realism and context of the negotiation. In many of the dyadic and most of the group simulations the parties are only given payoff schedules with their profits listed. There is no description of the basis for their choice or the roles they are assigned. In order to increase the realism of the negotiation simulation Weingart et al. (1993) not only used the profit associated with each alternative and issue but also a description of the alternatives and the roles. With our focus on negotiation as a type of decision making task that occurs in organisations, it was decided that the added realism would make the negotiation more authentic and easier for participants to engage in the role play. Giving subjects only profit schedules can highlight the profit aspect at the expense of entering into the role play. The issues and alternatives were constructed such that there was a logical sequence of decreasing or increasing utility represented by the alternatives (please see appendix II and IV for the profit schedule and a copy of the simulation).

Finally, the context of the negotiation was considered. An organisation was the negotiation context rather than a market situation (buyers and sellers). This is similar to several of the group negotiation tasks (cf. Arunachalam and Dilla, 1995). The recent move in the group negotiation literature toward more rich role plays, and different contexts so that the focus is on the decision making aspect of the negotiations was deemed important. The intra-organisational setting also provides us with a focus on group rather than individual outcomes.

In constructing the negotiation tasks other aspects of the simulation, other than structural dimensions must be considered such as reservation points and how much time to give the negotiating parties. In other dyadic and group negotiation simulations reservation points (the level at which a negotiator will not accept and agreement) are given to either control aspiration levels, set goals or to provide particular bargaining zone. It was decided that the reservation point would be given by instructing the participants that no agreement was worse than any agreement achieved. This choice was made based on pre-tests (where reservation points affected

the negotiators interpretation and aspirations in the negotiation), current literature (Arunachalam and Dilla, 1995), and the influence of reservation points on aspiration levels (White et al., 1994).

The amount of negotiating time given to participants was based on pre-testing. It was determined that 65 minutes was sufficient time (15 minutes to read the instruction and 50 minutes to negotiate). This amount of time allowed subjects to read the instructions and complete the negotiation, without giving too much time to the low issue complexity conditions.

To summarise, all the tasks were created using many of the elements found in Kelley's negotiation game. Four tasks had to be constructed so that they were as similar as possible, and at the same time ensure that complexity could be manipulated. The structure was similar, similar distances were created between the most important issue and the other issues, nine alternatives for each issue were included, and similar distances between alternatives were maintained. The tasks were also designed based on recent group negotiation research and the goals of the current research. In table 8 a summary of the dimensions for the tasks used in this study is provided.

Table 8 gives an overview of the decisions made in the construction of the simulation used in this study. This table can also be compared to table 6 outlining the dimensions of the previous dyadic and group negotiation simulations.

Table 8 Dimensions of the negotiation tasks used for the current study

Dimensions	Dyads		Groups	
	Low	High	Low	High
number of parties	2	2	4	4
number of issues	4	10	4	10
number of alternatives	9	9	9	9
integrative issues	4	8	4	8
distributive issue(s)	no	yes	no	yes
compatible issue	no	no	no	no
symmetric profit schedule	yes	yes	yes	yes
stable coalitions	no	no	no	no
number of trades	2	4	1	2
realism	yes	yes	yes	yes
inter-or intra-organisational	intra-	intra-	intra-	intra-
reservation point	impasse < agreement	impasse < agreement	impasse < agreement	impasse < agreement
time (total)	65	65	65	65

5.5 Summary

In this chapter we presented the rationale for using a simulated negotiation and argued that given our research question this was the best method to use. Existing simulations for dyads and groups were examined and the similarities and differences compared. It was concluded that the critical dimensions in the dyadic negotiation simulations had been maintained in the group simulations developed. However, no group task had been systematically compared to the original dyadic simulation and no task appears to have been developed that directly compares dyads and groups.

In section (5.4) we presented the conceptual decisions that were made in order to construct a negotiation task that could compare groups and dyads. Our goal was to keep the dyadic and group tasks as similar as possible. This was achieved by having

identical tasks between dyads and groups with the only difference being the addition of 2 extra people for the groups. We also designed tasks with two levels of issue complexity in which the exact same task in the lower issue complexity condition was embedded in the higher issue complexity task. The main difference between these levels was simply the addition of more issues. The context and the roles in the negotiation were identical across conditions. By increasing the number and type of issues within dyads and groups, enabled us to examine issue complexity, and examine dyads and groups across tasks. The tasks designed to test our research questions allow for comparisons to be made between dyads and groups. These tasks are also similar to both the original Kelley (1966) task and the group negotiation tasks.

In the Chapter 6 we present measures of our dependent and intermediate variables. The dependent variable is a product of the task presented in this chapter.

Chapter 6

MEASUREMENT: VARIABLES

In this chapter the operationalisations of our theoretical constructs are presented. These operationalisations allow us to empirically test our research questions. In section (6.3) we introduce the measure of the integrativeness construct (our dependent variable). In section (6.4) judgement accuracy, information exchange, and the other intermediate variables are described. Critical issues involving the reliability and validity of the measures will be examined along with each of the variables. However additional issues of measurement need to be clarified before we begin with a description of our operationalisations. In section (6.1) we outline the general measurement choices we have made and in section (6.2) we discuss the crucial issues of level of analysis and aggregation.

6.1 General measurement choices

So far we have argued that our research questions can be answered using a laboratory experiment and have presented a simulation, which captures the critical dimensions of a negotiation task. We now want to measure outcome quality and the processes that occur while performing this task. Based on our constructs and practical considerations, the outcomes of the simulations and a post-negotiation questionnaire were chosen to measure our variables.

The first relationship to be investigated is between people complexity and negotiation outcomes. A high quality negotiation outcome has been theoretically defined in Chapter 2 as an integrative agreement. An integrative agreement can be measured using the results of the simulation, which can be used to determine the economic dimension of integrativeness (detailed in section 6.3). The other dimension of integrativeness, the group level social psychological benefit, can only be measured through a self-report questionnaire. The dependent variable, integrative agreement, was measured using the outcomes of the simulation and questions from a post-negotiation questionnaire.

For our theoretical constructs of judgement accuracy and information exchange, self-report measures for the first, and observational data for the second construct were the most

appropriate method of measurement. However, observations of actual behaviour using a video or an audio were not possible based on the subjects involved, time and cost considerations, and practical issues. It was therefore decided since a self-report measure was needed for part of the dependent variable and the intermediate variable judgement accuracy, that information exchange could be estimated through the subjects reporting on the behaviour that occurred in the negotiating unit. The other intermediate variables required observation (procedural structure, problem solving and trading issues). It was decided that because direct observation was not possible, the best estimate of the behaviour in the negotiating unit could be obtained from the subjects within the unit reporting on the behaviour that occurred. This supposition will be further supported in section (6.2).

In order to measure outcome quality and the processes that occur while performing a negotiating task the results of the simulations and a post-negotiation questionnaire were chosen.

In the next section we will discuss issues regarding the level of analysis of the variables and then we will present our dependent variable and process measures.

6.2 Level of analysis and aggregation

The level of analysis in our study is at the group level and therefore all measures should reflect group level phenomenon. In this section conceptual and measurement issues with reference to the level of analysis and aggregation will be introduced.

It has been stated throughout this dissertation that the level of analysis is at the group level. What do we mean by level of analysis? First we must describe the focal unit and how levels of measurement and analysis fit together. Rousseau (1985) labels the unit we want to study the focal unit. In organisational research focal units can be the organisation, the work group, or the individual. When investigating the focal unit two types of levels exist: level of measurement and level of analysis. The level of measurement designates the unit to which the data are directly connected. For example, in the current study the level of measurement for people complexity is at the group level and individual self-reports about judgement accuracy is at the individual level. The unit the data are assigned to for hypothesis testing and statistical analysis is called the level of analysis and in our study this is the group level.

Finally, the generalisations made in the research are made to the focal unit. It is imperative that misspecification about the units and level do not occur. We will present the construct and variables in our study and clarify the levels of analysis and levels of measurement.

Both the focal unit of the constructs and the level of analysis are the negotiating unit: dyads and groups of four. At the level of measurement, however, we used both the negotiating unit and individual measures, and therefore we need to address issues regarding aggregating individual measures to the group level. Throughout this section we will use the term group level to refer to the negotiating unit. The use of group level analysis is the conventional method for referring to analysis of two or more individuals.

There are many errors that can occur when aggregating data however our discussion will be limited to those errors that could occur in our study. Other potential errors that exist when using aggregated data, such as cross-level fallacies are not discussed here for the following reasons:

1. The research being conducted is no multilevel, we are only investigating the group level not the individual or the organisational level.
2. We will not be comparing group level correlations with individual level correlations.
3. We have specified our focal unit our unit of analysis and they are the same.

The focus in this section is therefore on identifying potential problems and biases with aggregating individual data to group level variables and how this affects the way we interpret our results. In the succeeding sections in this chapter detailed descriptions of the variables and how they were measured will be given. At this point we will outline the general approach to the data and the measures.

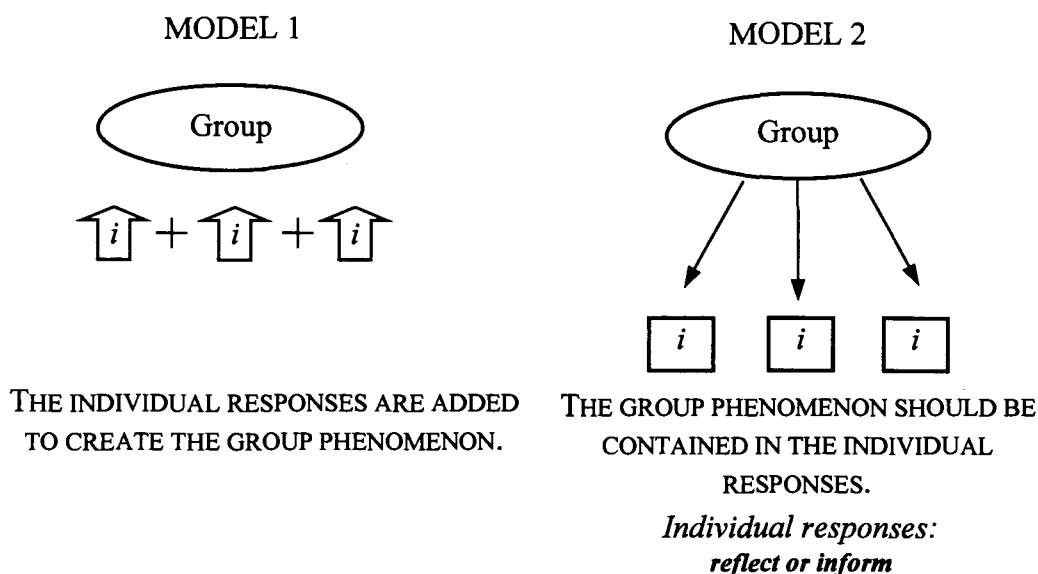
In table 9 a list of the variables and their respective focal unit, level of measurement, level of analysis, and the model of aggregation used are given. In the far right column of table 9, the model applied to the data to create the group level measure is given. These models are illustrated in figure 6 and discussed in detail following the table and diagram. Table 9 and figure 6 are meant to serve as guidelines for understanding our conceptualisation, and measurement, of the group level variables.

Table 9 Focal unit, levels of measurement and analysis, and model

Variables	Focal unit	Level of analysis	Level of measurement	Model
Economic	group	group	group	
Social psychological	group	group	individual	1
Fixed pie bias	group	group	individual	1
Priority information exchange	group	group	individual	1
Agenda structure	group	group	individual	2
Degree of organisation	group	group	individual	2
Problem solving	group	group	individual	2
Trading issues	group	group	individual	2

What role does individual data play in understanding a group phenomenon? In figure 6 we observe that there are two ways we can interpret the individual data and its relationship to a group phenomenon.

Figure 6 Measurement at the group level



Two models for understanding group level variables are presented. Model 1, illustrates how individual responses create the group phenomenon. Individual data is added together to define the group level variable and the individuals' data do not need to be related to each

other. For example, in this study judgement accuracy was determined by the fixed pie bias variable. Absence of the fixed pie bias indicated judgement accuracy. This variable was constructed for the group level by additively combining individuals' responses. The individual scores were added together to obtain a group level measure of the *degree of fixed pie bias in the group*.

For group phenomena that are represented in Model 1 the group level is represented by an additive summation of the individual responses. Aggregation does not create statistical problems because individual measures create the group level variable. However, there remains a conceptual issue related to whether this variable represents a group level phenomenon. This conceptual point will not be debated here nevertheless, we note that the variables created using Model I represent the *degree of the variable in the group*.

Model 2, illustrates how a group level property is represented in the individual responses. The group phenomenon, if it exists, should be embedded in the individual responses. For example, if we want to postulate that a group has a politeness norm the prerequisite for the existence of a group politeness norm is that individual responses reflect this norm. In situations where politeness should be exhibited, we expect that the individuals' responses in these situations would reflect the group norms. The existence of the group norm implies that individual responses should be similar.

Group level variables measured by the type of individual data, outlined in Model 2, can risk measurement problems. To what degree do the individual data indicate the existence of a group phenomenon? Several researchers have begun to address this issue so that group and individual effects can be separated from one another (cf. Florin et al., 1990 and Kenny and LaVoie, 1985).

In Model 2 a group level property is represented in the individual responses. The individual responses described above are meant to *reflect* this group property. There are other instances when individual data obtained for group level variables are meant to *inform* on the group property. Individual responses that inform on the group phenomenon give us an estimate of the actual group phenomenon. For example, with observable group behaviour where direct observation is not possible a good estimate of the behaviour in the group is the average of the individual responses.

When individual data is meant to inform on the group behaviour, average scores across individuals within the group is believed to be more reliable than any single individual's score (this assumes that no individual is trained as a key informant: Glick, 1985, and Ostroff, 1993). The differences in individual responses are considered random and having multiple respondents reduces this random error. Furthermore, using an average of individual responses to measure the group variable is recommended when two variables at the macro level are being examined (Glick, 1985, and Ostroff, 1993). In the present study all our variables are being examined at the macro level.

The distinction in Model II between individual responses that reflect or inform on the group property is necessary so that we can understand how the individual measures should relate to one another. When individual responses *reflect* the group level property then high intercorrelations are expected among the individual responses to ensure that a group phenomenon exist. However, when individual responses are informing on the group level property high intercorrelations are advantageous but do not represent the existence of a group phenomenon. High intercorrelations, when individual responses inform on the group phenomenon, represent the reliability of the measure. One potential problem with using an average is that if responses vary too much in the group than the group measure may not be reliable.

Returning to our study and the types of variables we are measuring and the role of the individual respondents we find that our two primary intermediate variables (priority information exchange and fixed pie bias judgement accuracy) which form the group phenomenon are constructed by adding individual responses: Model 1. We also constructed the social psychological dependent variable by adding individual responses (this will be discussed in detail in section (6.3.2)). Since the operationalisations are at the group level we do not risk aggregation problems. For the intermediate variables (agenda, degree of organisation, problem solving and trading issues) the individuals in the group act as informants of the group processes. The most appropriate measure of the group phenomenon under these circumstances is the group average. Measurement problems can occur here if the variance in responses is too great so that the reliability of the measure is questioned.

From the analysis of our variables we conclude that individual self-report data can be additively combined to create the group variable or can be averaged to estimate the group

process of interest. Reliability check will be needed to ensure that the group average is a reliable measure.

The issues discussed here are complex and may be main heavily debated in the literature. Our specification and arguments are not meant to define the right answer or the right way but to highlight our choices and arguments. In this section we have outlined our approach and isolated the principal risks our variables confront with aggregation. Two models have been presented to illustrate the different ways individual data can be combined and the relationship of this individual data to the group phenomenon. The largest risk to our group level variables is that individual data does not create a reliable indicator of the group phenomenon. These issues will be addressed when the individual variables and their measures are presented in sections (6.3) and (6.4) of this chapter.

6.3 Dependent variables

In the negotiation literature the quality of a negotiated outcome (the integrativeness) has generally been captured by economic measures (Thompson, 1990). We argued in Chapter 2 for the inclusion of a social psychological dimension. In this section we begin by presenting the economic measure of an integrative agreement (6.3.1) and then we will present the social psychological measure (6.3.2).

6.3.1 Economic measures

“Democratic theorists, economic as well as political, have long wrestled with the intriguing ethical question of how “best” to aggregate individual choices into social preferences and choices” (Luce and Raiffa, 1957:327).

In this section we argue that existing economic measures of negotiation outcomes which are meant to operationalise an integrative agreement are often atheoretical and incomplete. Based on economic theory, a complete definition of integrativeness, and the design of our task the Nash solution was chosen to measure an integrative agreement. Agreements in a negotiation can then be assessed by their *distance from the Nash solution*.

The choice of the Nash solution was based on three criteria: connection with economic theory, a complete definition of integrativeness, and suitability for my task. If economic measures are to be used to determine integrative agreements in negotiations they should be based on economic theory and reflect the central dimensions of the construct integrative: reconciling

interests and creating high joint benefit. In addition, measures of an integrative agreement need to be assessed in relation to the type of negotiation task. After a review of outcome measures in the negotiation literature Clyman (1995) concludes that there is probably no universally applicable measure for high quality outcomes in a negotiation and that measures of outcome should include a comprehensive understanding of the design of the negotiation task. We therefore discuss our choice of an integrative agreement measure in relation to the structure and context of our task.

We will now introduce in more detail the criteria and the reasons for our choice of the Nash solution. The following criteria will be presented in the subsequent subsections:

- a) The need for economic theory.
- b) The operationalisation of integrativeness.
- c) The structure of our task,
 - i) unique solutions possible to calculate in each negotiation, and
 - ii) distance from optimal solution possible to calculate in each negotiation.
- d) The context of our task (within an organisation).
- e) Cultural setting of present study.

6.3.1.1 Economic theory

The Nash solution is grounded in economic theory and it explicitly includes the distribution norm in the evaluation of the quality of an agreement. Other economic measures, although available, can be difficult to calculate for more complex negotiations and may not accurately represent the quality of the negotiated agreement.

The measures of joint benefit developed in the negotiation literature claim to be based on the axioms of individual rationality and normative analyses of negotiation behaviour (Thompson, 1990) originating in economic theory. John von Neumann and Oskar Morgenstern created mathematical models for investigating the economic behaviour of individuals under uncertainty based on several axioms (Nicholson, 1989). The axioms include statements about consistent beliefs, and consistent preferences (transitivity, dominance, and invariance) which when met lead to a linear utility function (Luce and Raiffa, 1957). The rational criterion for choice under uncertainty is to choose the alternative with the largest expected utility (Hogarth, 1987). From these axioms and theory the assumptions and predictions of individual

rationality and economic behaviour emerged. The argument derived from the economic theory states the economic behaviour should be rational.

In addition to defining individual rationality economists have provided us with normative analyses that have determined optimal solutions to bargaining problems which can be used to evaluate solutions for the bargaining situation. In a bargaining situation if we assume both negotiators are rational, economic theorists have tried to solve the question of what constitutes a rational agreement between the negotiators. The first measure is whether the parties reach an agreement (if an agreement is possible). The next step is more difficult, to determine how good the agreement reached is.

A bargaining solution can be presented as a fair solution or as solution that represents the actions of rational and self interested players (Bovens, 1987). Nash (1950) presented such a solution in which both fairness and rationality were dimensions of the agreement (Tripp and Sondak, 1992). We can view Nash's solution as an ideal solution for rational players or as the rational and fair solution if an arbitrator were to decide on a solution. Nash introduces us to a unique solution to a bargaining situation based on the following set of axioms:

1. Feasibility
2. Individual rationality
3. Scale invariance,
4. Pareto optimality,
5. Independence of irrelevant alternatives, and
6. Symmetry.

Given the above parameters a unique solution can be derived. Nash's solution requires that a settlement is possible and that the individuals behaviour is rational (van Damme, 1986). Assumptions three and five refer to assumptions found in utility theory (Luce and Raiffa, 1957). Assumption three states that if there are two versions of the same bargaining game (they differ only in their units and the origins of the utility functions) then the arbitrated values for the two games will be related by the same utility transformation (Luce and Raiffa, 1957). This assumption thus rules out interpersonal comparisons of utilities (van Damme, 1986). Assumption five assumes that if we have a solution for a bargaining situation with a large set of possibilities and if this solution exists in a bargaining set with fewer possibilities then the same solution should be chosen (Shubik, 1975).

Assumption four, which is the focus in the recent debate in the negotiation literature, states that an agreement is Pareto optimal if, no other agreement exists that is better for both parties or at least better for one party and the other party is not made worse off. Assumption six assumes that bargainers have equal bargaining ability. If a bargaining game gives players completely symmetric roles, "...the arbitrated value shall yield them equal utility payoffs, where utility is measured in the units which make the game symmetric" (Luce and Raiffa, 1957:127).

Given these axioms the Nash solution determines the unique solution to a bargaining game which maximises the product of the negotiators' profits (utilities). The Nash solution has been criticised by economists as, not always providing the best solution since it can lead to distributions that favour the rich over the poor, and/or not being realistic about interpersonal comparisons (c.f. Luce and Raiffa, 1957). Depending on the structure of the particular game (or the shape of the players utilities) these criticisms are more or less relevant (Yaari, 1981). The structure of our task does not make these criticisms applicable.

The assumptions of an ideal solution that should be highlighted are, Pareto optimality and Symmetry. It should be noted that most solutions to co-operative games in economic theory satisfy both properties of Symmetry and Pareto-optimality (Lensberg, 1997). The other axioms of the Nash solution are incorporated in our task (i.e. a solution is feasible, we assume individual rationality etc.).

To summarise, the economic theory states that rational players should reach a solution if there is a positive bargaining zone. This solution can then be evaluated based on the criteria of efficiency and symmetry. The economic measure for bargaining solutions, based on economic and game theory, is the extent to which a solution approaches the ideal solution. The ideal solution that matches these criteria and which can be calculated from our task, is the Nash solution.

6.3.1.2 The operationalisation of integrativeness

The second reason for choosing the Nash solution is related to our construct integrative. In the negotiation literature there have been discussions concerning the appropriateness of certain economic measures, however the conclusions appear to confuse economic measures

with integrative outcomes. Economically rational and integrative are not mutually exclusive concepts, however not every economic measure captures the richness of what is meant by an integrative agreement. Recall from Chapter 2 that integrative agreements are those that reconcile the parties' interests and produce high benefit for both parties (Follet, 1925; Neale and Northcraft, 1991; Pruitt and Carnevale, 1982).

In the negotiation literature integrative agreements have been defined and operationalised by their efficiency (cf. Bazerman, et al., 1988; Clyman, (1995) and Thompson, 1991). In fact Thompson (1990: 517) states that the, "... economic definition of integrative bargaining is precise and refers to whether negotiated outcomes are efficient, or Pareto optimal". In recent articles this idea of economic efficiency has dominated debates regarding the economic outcome measures of negotiations. However, there has been little debate about whether this efficiency criterion is a sufficient criterion to understand the integrativeness of an agreement.

One exception is Pruitt and Carnevale (1982:155) who discuss Pareto efficiency, joint profit and a measure developed by Sen (1970). Sen's measure evaluates agreements based on the party who receives the lesser sum. This measure considers distributional aspects of the outcome. Thompson et al. (1988) also suggest that more equal distributions among group members, when power is equal, is a desirable objective and in their study found a strong correlations between unequal distributions and low group scores. Although some theorists point to the importance of distributive aspects of the negotiation, few researchers have used economic measures that include both Pareto efficiency and distribution norms.

Tripp and Sondak (1992:282) criticise the use of joint profit as an outcome measure because sometimes, "... negotiation researchers who use joint profit as a measure of dyadic performance may be confounding distributive norms with rational choice by negotiators." Tripp and Sondak (1992) then propose a Pareto-efficiency measure that they claim does not confound performance with distribution norms. However, Clyman (1995:48) presents arguments claiming that "there cannot exist a single measure of joint performance that is distribution free in every negotiating setting." The question that emerges for us is how can performance be divorced from distribution when we are measuring integrative agreements?

Our argument is that the negotiation tasks used in the research have been constructed based on economic considerations, and therefore economic measures of quality should be used to

measure integrativeness. The use of joint profit can make interpretation of outcomes confusing because it does not rely on economic theory (Tripp and Sondak, 1992). Although using high joint profit might imply that a particular distribution of resources is optimal, it does not explicitly measure the distance of other agreements from this optimal solution. The Pareto efficiency and Integrative quotient measures put forward by Tripp and Sondak (1992) and Lax and Sebenius (1987), respectively, measure efficiency and attempt to exclude distributional considerations. These measures can favour individual rationality over the reconciling of interests at the group level. We argue that distributional factors are quintessential to evaluating the integrativeness of an agreement.

It is contended that although efficiency is an important aspect of measuring agreements, the distribution of the resources is also critical for evaluating the integrativeness of the agreement. Setting certain distribution norms as optimal has a long history in economic theory and several solutions are available to examine the quality of agreements based on the degree of efficiency and the distribution of resources. Efficiency is not integrativeness, but it is one dimension of integrativeness. We argue that distribution norms should be made explicit and included in the measure of integrativeness.

The current trend in the negotiation literature to move towards more theoretically based economic measures has led to definitional operationalism [measures define the construct (Campbell, 1969)]. For example, economic measures such as Pareto efficiency are equated with integrativeness (c.f. Thompson, 1990 and Thompson et al., 1988). The problem of defining integrative with a narrow economic measure is that it excludes fundamental dimensions of the construct. The difficulty is not so much with the measures themselves, but with the link of these measures with the integrative construct. With only one operationalisation of integrative it can be argued that we are not accurately measuring this construct. What is required is multiple operationalisations of the concept. If we only conceive of integrative agreements in terms of Pareto efficiency we define integrative by rationality alone and do not include other central dimensions of joint benefit, such as the distribution of resources among the parties. The distribution of outcomes is very important when we are *measuring joint benefit* and as stated earlier this dimension has often been included in defining optimal economic solutions in similar tasks investigated by game theory (c.f. Nash, 1950).

The Nash solution represents both efficiency and symmetry, which appear to be a better operationalisation of integrative agreement than Pareto-efficiency alone. Carnevale and Pruitt (1992) reviewed the literature reporting that norms of fairness and equal outcomes can lead to faster and/or more reliable agreements. Problems can arise as to which fairness criteria should be invoked however, based on the structure of the negotiation task for this study and the types of utilities given to subjects, equal distribution would be the fair solution. A Nash solution adequately reflects the ideal integrative agreement, and other agreements can be compared by their distance from this ideal solution.

An integrative agreement needs to be operationalised to reflect the primary dimensions of the construct. We argue that both Pareto Optimality and Symmetry are essential to measure in order to capture what is meant by an integrative agreement. In this section we note that the measure which can fulfil these requirements is the Nash solution.

6.3.1.3 The structure of our task

The structure of the tasks we designed in terms of size (people and issues), symmetry, equal power, and no possibility of coalitions also made using the Nash solution appropriate.

The size of the tasks and comparisons that needed to be performed made use of other economic measures, such as Tripp and Sondak's measure, more difficult to interpret and compute. The Nash solution on the other hand was easy to calculate and to interpret. The Nash solution enables us to calculate a unique solution so that distances from this unique solution can be determined in each task. The differences in tasks can be discussed with reference to all possible agreements. The distances from the ideal solution are standardised across tasks and therefore can be compared. Because all the tasks are symmetric, have similar internal structures, and the solutions all have the same properties, it can be argued that the comparisons are valid.

Comparing agreements based on their distance from the Nash solution is meaningful for several reasons. By measuring distances we have a conceptual understanding of the relative quality of the agreements. We do not measure how many better agreements there are to assess the degree of integrativeness, or use the percentage of the total of the best agreement, instead we use the distance from the best solution.

6.3.1.4 The context of the task

The setting of the task also influenced our choice of the economic measure of an integrative agreement. The simulation was designed to be intraorganisational and therefore not only is individual rationality important but also group level rationality. As stated previously the Nash solution determines the best arbitrated solution for the bargainers. In an organisation we could assume that rational and fair criteria would be used to evaluate outcomes for a group task.

If only Pareto-efficiency is considered and not the distribution of the outcomes, negative consequences could arise in an organisational setting. For example, in the tasks used in this study some players could acquire all the profit and at least one of the other players would receive nothing. This agreement based on Pareto-efficiency criteria would be classified as integrative. From a top management perspective such a solution could be very damaging to the organisation as a whole. Also, if organisational members do not consider solutions fair other problems could arise. There is empirical evidence that negotiators themselves prefer equal payoffs (Lowenstein et al., 1989). The setting of the task indicates that social utility needs to be considered in addition to individual utility. A high quality outcome for groups in organisations needs to include both the Pareto-efficiency of the agreement and the symmetry.

6.3.1.5 Cultural setting of present study

Finally, the subjects used in this study differ from previous studies in that most studies have used American students whereas this study uses Norwegian students. Collective concerns, as opposed to individual self interest could be argued as more important in the Norwegian context (Rognes, 1994). Therefore, it could be contended that symmetry and equity aspects of a negotiation are even more essential for measuring the integrativeness of an agreement using Norwegian subjects.

6.3.1.6 The Nash solution and other measures

We have already argued that the Nash solution is based on economic theory, is a good measure of integrative agreements, and is particularly suited for our task. In this section we will briefly review the other measures not chosen, and those which have been used to measure group negotiation outcomes.

In the negotiation literature, although integrativeness has been the construct used to understand high quality outcomes the operationalisation of this construct has often led to ignoring economic theory or an over emphasis on efficiency. In the dyadic negotiation literature most solutions, until recently have used joint profit (Tripp and Sondak, 1992) and currently, the focus is on the Pareto-efficiency of agreements. Pareto-efficiency measures, although founded on economic theory, neglect distributional dimensions of the agreement and fail to give a complete definition of integrative.

The degree to which an agreement is fair or symmetric has not received as much attention. Some exceptions are Eliasberg et al. (1986), Greenhalgh et al. (1985) and Greenhalgh and Neslin (1983) which have used the Nash solution and compared agreements based on their distance from the Nash solution. These studies were mentioned but not discussed in Tripp and Sondak's (1992) review. However, these researchers were focused on testing the emergence of Nash solutions rather than using them to describe outcomes.

Some studies have examined the distribution of resources as a separate measure (cf. Arunachalam and Dilla, 1995), or have examined the outcome of the lowest negotiating partner (Kimmel et al. 1980) or have argued the importance of fairness in evaluating outcomes (Bazerman, 1993). As mentioned earlier, Sen (1970) presented an evaluation based on the "lesser -outcome". Although these studies have included distributional considerations it is unclear how these measures are linked to economic theory or and to the integrative construct. It appears that although distribution measures have been considered an important aspect of an integrative agreement they have not be used consistently or tied explicitly to the construct. This makes these measures more ad hoc and difficult to interpret across studies.

Since we are investigating group negotiation we will give a brief overview of the quantitative outcome measures that these studies have used (for a comprehensive overview of the outcome measures in the dyadic literature please see Tripp and Sondak, 1992).

Table 10 Quantitative and economic outcome measures in the group negotiation research

	QUANTITATIVE MEASURES		ECONOMIC MEASURES				OTHER
	Joint profit	Distribution	Individual profits	Impasse	Inferiority index	Pareto Optimality	
Thompson et al. (1988)	yes	yes (equality)					
Mannix et al. (1989)	yes		yes	excluded			yes
Weingart et al. (1993) study 1	yes			yes	yes	yes	
Arunachalam and Dilla (1995)	yes	inequality	yes				
Shapiro and Rogness (1996)	yes						

From table 10 we note that all the studies have used joint profit to measure integrativeness, 2 studies have examined the distributions (Arunachalam and Dilla, 1995 and Thompson et al., 1988) and only one study has used economically grounded measures (Weingart et al., 1993). Individual profit can be rooted in economic theory, however, it provides no measure of the integrativeness of the agreement and also it is difficult to statistically analyse. Impasses can be used to understand agreements but does not tell us about the integrativeness of the agreement.

In the negotiation literature there needs to be more clarification and justification of the quantitative measures used. The quality of a negotiated agreement needs not only to reflect individual rationality but joint rationality. This cannot be captured meaningfully by efficiency alone. It is important not to confuse equity and efficiency yet we can argue that both are necessary to understand the integrativeness of an agreement (Mumpower, 1989 quoted in Neale and Northcraft, 1991).

When we examine the Nash solution in comparison to other measures of integrative agreements, we note that the Nash solution is similar to other measures yet grounded in theory and contains the two main dimensions of an integrative agreement.

One final clarification should be noted. The Nash solution is used as both a predictor of rational behaviour and as the optimal solution if a third party were to arbitrate an agreement with full information about both parties utilities. The purpose of an economic measure in this

study is to define a rational and best solution so that other agreements can be measured with reference to this optimal solution. In this context the solution is seen as normative and as a goal to strive towards. In the negotiation literature the Nash solution has received empirical support as a predictor of dyadic solutions (Greenhalgh and Neslin, 1983) however, for the purposes of this paper it is seen as the ideal, normative solution, not as a predictor of behaviour. We will therefore calculate the ideal solution and measure other agreements according to their distance from this ideal solution. Calculation of the Nash solution for our tasks can be found in appendix (V).

6.3.1.7 Impasses

The Nash solution argued for in the above sections instructs us how to compare agreements reached. It is now necessary to clarify how economic outcomes can be calculated for negotiating units who did not reach an agreement. In the current study impasses are seen as a crucial aspect of the quality of the negotiation.

In the literature impasses have not been treated systematically. Researchers have dealt with impasses in the following ways:

1. Not reporting them, or excluding them from analysis (Mannix et al. 1988).
2. Giving impasses a numeric score based on reservation prices (Carnevale and Lawler, 1986).
3. Giving impasses a numeric score based on compromise solutions (Pruitt and Lewis, 1975).
4. Giving impasses a numeric score based on the lowest agreed outcome (Kimmel et al., 1980).
5. Giving impasses a numeric score of 0 (Yukl et al., 1976).

Deciding on how to treat impasses is both a theoretical and statistical issue and one that demands more attention (Tripp and Sondak, 1992). Theoretically we are concerned that our outcome measures accurately reflect the quality of the negotiations. If we exclude impasses we create a selection bias in our results and risk not accurately representing quality outcomes. Statistical problems emerge if we give impasses a score of 0 as this leads to increased skewness and heterogeneity of variance in the dependent variables. This makes the use and

interpretation of the statistics questionable. In addition to these considerations, the nature and purpose of the experiment are critical factors in deciding how to treat impasses.

Our decision based on theoretical, statistical, and experimental considerations was to keep impasse information by reporting the number of impasses between the experimental conditions and by incorporating them into the economic measure of joint performance. We did not explicitly give a quantitative alternative to the negotiated agreement, however subjects were told that any agreement was better than no agreement. It was therefore decided to give the lowest score achieved in the total sample to dyads and groups who reached impasses. This choice has been implemented previously in the negotiation research (cf. Kimmel et al., 1980).

The choices not taken and the reasons why will be briefly described. Assigning 0 to negotiating units who did not reach an agreement would have been commensurate with the instructions of our task, however, as stated earlier this would cause large statistical problems and is not recommended (Kimmel et al. 1980 and Tripp and Sondak, 1992). A compromise solution could have been assigned to groups who did not reach agreement, however this choice would lead to inflated outcomes for impasses. Based on our economic measure of integrative agreements (the Nash solution) giving a compromise in our task would give negotiating groups high scores on symmetry which would inflate their economic outcome score. Giving impasses a compromise solution would therefore not reflect a low quality outcome. The last option would have been to treat impasses as missing data, however this choice would lead to weaker statistical tests, as well as, a loss of important information regarding our experimental manipulations.

To give the dyads/groups the lowest score reflects a conservative approach (since more points are being given than earned). Tripp and Sondak (1992) argue that problems occur if an explicit alternative value is given to negotiators since this can affect aspiration levels. They also state that problems occur by not giving an explicit alternative to the negotiated agreement since assigning them a score gives the negotiators more than they agreed to. Either choice can lead to problems. Since our pre-test indicated that aspiration levels were affected by giving reservation points we opted for assigning an outcome score although no numeric reservation point was given. We wanted the score given to impasses to reflect the furthest distance from the Nash solution; therefore impasses were given the score of the lowest negotiating unit. Our

decision is conservative and statistically safe and is theoretically based on previous research and our choice of the economic outcome measure (Nash solution).

In this section we have presented theoretical and practical evidence for the suitability of the Nash solution to measure economic outcomes in this study. We have also accounted for the treatment of impasses and how they will be incorporated into the outcome measure. In the next section we will present the social psychological dependent variable.

6.3.2 Social psychological dependent variable

As argued in Chapter 2 integrativeness has objective and subjective dimensions. The subjective dimension is based on the negotiators' perception of the negotiation. One of the critical perceptions in negotiation is the negotiator's perception of the bargaining situation in terms of satisfaction and evaluations of fairness (Thompson, 1990). Judgements of fairness and satisfaction with the procedures and outcomes in a negotiation are part of the negotiator's subjective outcome. This subjective dimension of integrativeness is conceptualised as the social psychological joint benefit.

To operationalise social psychological joint benefit five questions were developed and derived from the general negotiation literature. The questions addressed the individual's satisfaction and feelings of fairness with the negotiation process and outcomes. A 5 point Likert scale was used where the endpoints were 5= satisfied and 1= dissatisfied, and 5= fair and 1= unfair respectively. The scale used is similar to the one used by Shapiro and Bies (1994).

The social psychological joint benefit variable is at the group level so it was necessary to aggregate the individual data to the group level. In figure 6 of this chapter, two models of aggregation were presented. The model of aggregation used for the subjective dependent variable is Model I. The social psychological joint benefit was measured using 5 indicators (5 questions relating to satisfaction and fairness). These indicators were additively summed to create group level indicators. The negotiating units contained 2 or 4 parties, so to standardise scores across groups, averages were used to indicate the degree of the indicator in the group. The mean was not used to represent the indicator at the group level (for example, group level satisfaction) but instead it was meant to provide a standardised score of the amount of the indicator in the group.

These five group level indicators were then examined to see if they reflected the construct social psychological joint benefit. We anticipated that our five indicators would reflect one construct. Previous research has shown high correlations between the subjective dimensions of satisfaction and fairness (Shapiro and Bies, 1994). However, in general perceptual measures have not received a great deal of empirical attention (Neale and Northcraft, 1991) especially at the group level, therefore the degree to which the five group scores would reflect one construct needed to be examined.

Table 11 Coefficients for the social psychological questions

	n	alpha coefficients
individual level	150	,7809
group level	57	,8177

The high alpha coefficients at the group level show that the five indicators are strongly correlated and reflect one construct. The reliability of the 5 group indicator scores was high ($r = .8116$). Based on these initial findings it was decided to create a factor to represent the social psychological benefit in the group. This procedure enables us to evaluate the dimension of social psychological joint benefit, and provides clarity and parsimony in our subsequent analysis.

Before presenting the factor analysis it is important to reiterate that when examining group level correlations there is a risk that these correlations are inflated compared to individual level correlations (Ostroff, 1993). The interest in this study is not in analysing differences in the correlations of individual level variables and group level variables but in examining correlations between group level variables, only. However we did want to investigate if a different conceptualisation and aggregation method (examining indicators at the individual level) would produce different results. In table 11 we have provided correlations at the individual and group level and note that these correlations are almost identical. This indicates that our aggregation method, in addition to being conceptually consistent with the group level construct of social psychological joint benefit, does not overly inflate the relationships at the individual level.

A confirmatory principal component factor analysis was conducted to summarise the information contained in the five group indicators. Confirmatory factor analysis requires that hypotheses be made regarding the number of factors to be extracted and if possible the variables that will load on these factors (Kim and Mueller, 1986). This imposes a particular model on the data. The principal component factor analysis is the exact mathematical transformation of the raw variables and enables us to create a score (based on the variables) that exactly represents the components in the factor (Kim and Mueller, 1986). By running a confirmatory principal components factor analysis we can ensure the five scores are related to one another and also create one score that reflects all five components based on their relationship to the factor.

Before presenting the factor loadings and results, the standard guidelines for performing a factor analysis are outlined. In order to conduct a factor analysis the general rule is the number of observations should be four or five times greater than the number of variables to be analysed (Haire et al., 1992). In our study we have 57 groups (dyads and groups of four) and 5 variables. The criterion for including the variables with factor loadings of $\pm .30$, was predicated as the general rule of thumb in the literature (Tabachnick and Fidell, 1983). With only one factor to extract there was no need for rotation.

We have hypothesised one factor with all five variables loading positively on it. The initial unrotated factor provides the best linear combination of variables and the first factor can be seen as the best summary of linear relationships demonstrated in the data (Haire et al., 1992). From table 12 we can observe that the factor loadings range from .554 to .861 and percentage of variance explained is 59.34%. It was decided to use this factor score to simplify data analysis and enhance theoretical understanding.

Table 12 Factor loadings

Variables	Factor 1
group outcome satisfaction	.837
group process satisfaction	.767
group outcome fairness	.861
group process fairness	.554
group individual satisfaction	.797
% of variance and cumulative	59.34

The construct of social psychological joint benefit is similar to economic joint benefit in that individuals within groups can have different levels of benefit. Our construct does not assume group similarity in answers, although this can happen, it is not necessary. It should be noted that the factor score represents the *degree of social psychological benefit in the group* and not the group social psychological benefit.

The indicators of social psychological benefit in the group have shown high reliability (see table 11) and now issues of validity of our measure need to be addressed. The extent to which different questions (indicators) of the construct correlate is an indication of the extent to which they measure the target construct (Judd et al., 1991). Theoretically it is expected that social psychological joint benefit will be related to economic measures of joint benefit (see Chapter 2). This expected relationship is confirmed, these two variables are significantly correlated with one another ($r=.361$, $p<.01$, 1-tailed). The face validity of the measure was evaluated by comparing our questions with questions used in previous research (Pinkley et al., 1995 and Shapiro and Bies, 1994) and by examination of the questions by colleagues studying negotiations. Based on these observations and checks it suggests that the measure of social psychological benefit is valid

In this section we have presented the social psychological measure of integrativeness and reported the validity and reliability of this instrument based on our sample. This measure is correlated with the economic measure yet it represents the psychological component of an integrative agreement. In the next section we will present the measures for our intermediate variables.

6.4 Intermediate variables

As stated in section 6.1 the intermediate variables were measured using a post-negotiation questionnaire. The questionnaire was developed using questions from previous negotiation studies and Likert scales. Where possible multi-items were used to measure constructs to increase the reliability of the measure. Data was collected at the individual level and was aggregated to the negotiating unit level. Use of indexes and use of multiple respondents increased the reliability of the estimates. In section (6.4.1) a discussion of formative and

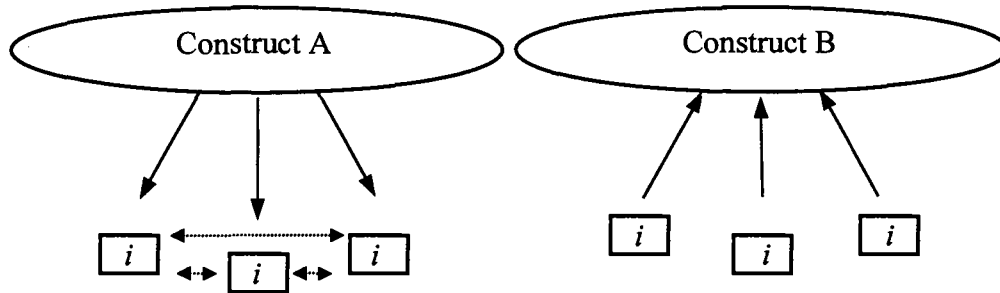
reflective measures is presented to clarify the background for index use. The validity of the measures was considered acceptable based on pre-testing, previous research and the straightforward nature of many of the questions (high face validity). Construct validity of the variables will be discussed individually as they are described in this section.

The intermediate variables were measured using a post-negotiation questionnaire. The questionnaire consisted of 24 questions of which the following questions were related to the present study 1,2, 3, 4, 5,6a, 6b, 6c, 6d, 6g, 6h, 6i, 7, 15, 16, 17, 18, 19, 20; questions 21-24 were demographic questions (please see appendix (I) for a copy of the questionnaire). The questionnaire was administered to individuals, and each variable was aggregated to the group level. In the next section we will briefly discuss general measurement issues that apply to our questionnaire.

6.4.1 Formative and reflexive measures

When measuring a construct the central question we need to ask is whether indicators reflect the construct or form the construct. Bollen and Lennox (1991) state this in another way and divide between indicators as causes or effects of the construct. It is critical to decide the type of construct, which is being measured as this has serious ramifications for testing the reliability of the indicators chosen. In figure 8 the construct *A* is measured by indicators, *i*. These indicators reflect construct *A* and therefore we expect (provided it is a unidimensional construct) that these indicators are highly correlated (Bollen and Lennox, 1991). With construct *B* the indicators, *i*, are said *to cause* the phenomenon and therefore we can make no predictions about the correlations between these indicators. In order to assess the reliability of the measure of construct *A* we can check inter indicator correlations (within construct correlations) however with construct *B* checking correlations would be inappropriate and could lead to incorrect choices. Causal indicators are not invalidated by lower internal consistency.

Figure 7 Formative and reflective measures of constructs



When designing the questionnaire and the questions that would be used to measure our variables we needed to decide whether our constructs were *A* or *B* constructs. *A* constructs require that indicators be assessed using scales, whereas *B* constructs require indicators to represent different facets of the construct and therefore require indexes.

An index can be understood as composite measure that combines two or more items or indicators (Nachmias and Nachmias, 1981). Three reasons for using indexes are that they provide parsimony (several variables can be represented by a single score); greater precision and statistical manipulation, and increased reliability of the measure (Nachmias and Nachmias, 1981).

In our study procedural structure was conceptualised as a *B* construct and two indexes were formed to measure this construct. To ensure the validity and reliability of indexes the key dimensions of the construct need to be identified. Examining the internal consistency and correlations among the indicators cannot assess reliability for this measure. We will discuss the reliability and validity of our indexes in section (6.4.1.3).

In the next section we present the operationalisations of the variables. Recall from Chapter 3 that the intermediate variables of interest in this study are judgement accuracy, information exchange, procedural structure, problem solving, and trading issues. For exact translations of the questions described below see appendix (I)

6.4.1.1 Judgement accuracy

Measuring whether subjects viewed the whole negotiation as fixed or variable was the central concern of our investigation. Originally an index of judgement accuracy was constructed which included two other questions. One of the questions asked for specific information regarding the other parties most important issues. Due to the different tasks and confusion answering the question, this question was dropped (see Appendix I for the question). The second question, not included for analysis, asked subjects whether they perceived the negotiation as a win or lose situation (see Appendix I). During debriefing it was discovered that subjects had misunderstood this question. We therefore decided to use the one general question on judgement accuracy.

The question is:

Do you believe that your most important issue is also the most important issue for the other party?

This general question indicates whether the subject consciously thought of the negotiation as fixed or variable. It was found that this single item measure had high validity with related indicators. For example, from the literature we expect judgement accuracy to be correlated with high joint profit and this was supported ($r=.45, p<.001$). Other measures of judgement accuracy have varied in the amount of detail subjects must provide about others' priorities (Carnevale and Isen, 1986; Kimmel et al., 1980; and Thompson and Hastie, 1990a). Our conservative measure of judgement accuracy is similar with those used in Thompson and Hastie (1990a).

The question was scored by giving individuals either 1, for a correct answer that the task was variable sum, or 0 for an incorrect answer that the task was fixed sum. Individual data were additively combined to form a group score, *degree of judgement accuracy* in the group. Each negotiating unit received a score between 0-100 where a score closer to 100 indicates more members with a fixed pie bias (absence of judgement accuracy).

Summing individual accuracy scores to calculate the degree of judgement accuracy in dyads and groups has been used in previous studies (Arunachalam and Dilla, 1995, and Thompson, 1991).

Judgement accuracy at the negotiating unit level was calculated by measuring the percentage of subjects in the unit who had a fixed pie bias. A higher score represented a higher percentage of people in the group with a fixed pie bias and therefore a lower degree of judgement accuracy in the group. Validity was assessed through the relationship of this variable to other theoretically relevant variables and its high face validity. Next we will present the information exchange variable.

6.4.1.2 Information exchange

Recall from Chapter 2 and 3 that the exchange of information in a negotiation can be important for achieving integrative outcomes. The information deemed most important, and which has been linked to integrative outcomes, is information about the priority of issues for the different parties (Thompson, 1991).

In order to measure sharing priority information individuals were simply asked if they told one or more members in the group which issue was their most important issue. If members told another member they were given 1 point. These points were additively summed to form a group score. In order to standardise the scores percentages were used.

The variable sharing priority information was measured by the percentage of members who shared their priority information. Similar to the fixed pie variable, this measure has high face validity.

6.4.1.3 Procedural structure

Recall from Chapter 2 the two elements in procedural structure that were determined important in comparing dyads and groups: the type of agenda used and the degree of organising. The type of agenda has often been manipulated in experiments (cf. Mannix et al., 1989 and Weingart et al., 1993) whereas in this experiment we wanted to measure it. Rather than seeing the type of agenda used as a dichotomous variable we imagined that groups would differ in degree of using simultaneous or simultaneous consideration of issues.

We also decided that at different times in a negotiation different agendas could be used. For example, in the beginning the groups might have considered issues one by one but by the end of the negotiation they could be using packages. We therefore created an index that could measure the degree to which the negotiation could be characterised by simultaneous or sequential considerations of issues. Four questions were developed and individual scores were averaged to create the group score (see Appendix I for exact translations). Since these questions were asking respondents to inform on the group processes averages were the best estimate of the behaviour that actually took place. Respondents were asked to state the degree (a Likert scale was used with 1 representing in to small degree and 5 representing to great degree) to which the following behaviours occurred in the negotiation process are:

- (1) The group discussed all issues together.
- (2) The group decided on issues one at a time.
- (3) The group agreed on more than one issue at a time.
- (4) The parties took turns describing which issue was most important for them.

The first three questions are straightforward in that they measure to what degree issues were dealt with one at a time or together. The last question examines whether the group structured the process so that each group member gave priority information. Although this question is related to sharing priority information, it was deemed appropriate to include in the agenda measure. By including this question, a better understanding of the structuring of the process is obtained. We do not know with this question if individuals *did reveal* their priority issue, this can be determined by the information sharing question discussed above. In Weingart et al. (1993) the results indicated that simultaneous agendas cued group members to share information about preferences and priorities. With this question we explicitly cover the structure of sharing information, although we do not measure whether the information itself was shared.

As groups increasingly discussed more than one issue together, handled issues together and not one by one, and structured the process by taking turns stating which issues were important, the agenda can be characterised as increasingly simultaneous rather than sequential approach. The group score range on this index was 4-20 where 4 represents a group that

approaches the negotiation issue by issue (single issues) and a score of 20 represents a group that approaches the negotiation dealing with several issues at once (multi-issue).

The degree to which the negotiating units organised the negotiation process was measured by a degree of structure index, which included two group scores on the questions:

(1) Degree of leadership.

(2) Time spent organising.

Each of these question was originally asked on 5 point Likert scale, with 5 representing to what extent the negotiation process was characterised by a person who helped co-ordinate the process (leader), and/or time was used in the beginning to organise and plan the negotiation (see Appendix I for exact translations). The leadership question was phrased so that it made sense to people negotiating in dyads. Group scores were calculated with averages, and then added together to form the index. Again averages were considered the best estimate of the group process. The scale ranged form 2-10, where 10 was high degree of organisation- the process was characterised by leadership and time spent organising.

Procedural structure both in terms of content and degree was measured by two indexes. The indexes were formed based on estimates of the group behaviour that actually occurred. By using indexes we increase our reliability and by asking subjects to inform on group processes we have multiple measures of the process behaviours.

In addition, the reliability of the indicators was checked. If respondents are acting as informers on group processes and their responses differ greatly, the group level indicator might not be a reliable measure. We therefore ran a test to ensure that variance between groups was higher than variance within groups (illustrating intra-group agreement) on each indicator. Variation on all these indicators was greater between than within groups indicating group members had similar perceptions about the group procedures.

6.4.1.4 Problem solving and Task requirements

The construct problem solving was measured at the group level. We wanted to know the degree to which the process was considered constructive problem solving by the negotiators. Problem solving behaviour stems from a problem solving orientation or strategy. When the

negotiators view the issues or parts of the negotiation as a problem to be solved the behaviour produced is usually flexible and inventive and the negotiators search for a variety of options (Walton and McKersie, 1965). Problem solving is often manipulated by instructing the negotiators to take a particular approach. For example, Pruitt and Lewis (1975:65) instructed participants to “view the bargaining situation as a solvable problem. Attempt to play down the conflict nature of the task and view it as a problem situation”

The negotiators were expected to inform on the problem solving of the group (see Appendix I for the exact question). Subjects were asked to rank the following: To what degree was the negotiation process characterised by the following statement (a 5 point Likert scale was used with 1 representing–small degree and 5 - large degree):

(1) Constructive problem solving approach was used in the group.

Although the problem solving measure is a single item question, our main interest was to identify if the approach taken by the negotiating unit was focused more on finding a solution or on bargaining. The question has high face validity. We checked the reliability of the measure and determined that variance between groups was higher than variance within groups indicating sufficient reliability of the group measure.

The variable trading issues was measured on a similar 5 point Likert scale (see Appendix I for exact translations). We asked the individuals members: To what degree do the following statements describe the negotiation process:

(1) The negotiating unit traded issues (I will give you issue 2 if you give me issue 4).

The trading issue question had high face validity and once aggregated to the group level gave a good estimation of group behaviour. Reliability of individuals as informers on the group process was assessed, and again variation between groups was greater than variation within groups indicating the measure was suitably reliable.

It should be noted that although single items have been used, because we are aggregating the responses to the group level, reliability increases. Although multiple items have not been used, multiple responses to items increases the reliability of the measure. In addition we checked to ensure that there was not too much variation among the group members’ responses

(variation between groups was higher than variation within groups). This final check indicates reliability of respondents.

In the next section we briefly describe our experimental manipulations (our independent variables).

6.5 Manipulations

The independent variables were people and issue complexity measured by the number of people and the number of issues in the negotiation. Subjects were divided into male and female and then randomly assigned to negotiate in groups of four, with four issues or ten issues, or in dyads with four issues or ten issues.

6.6 Procedure

In this section we present the pre-tests we conducted to ensure that our simulation was believable and logical to subjects and that our questionnaire was clear and appropriate. We then present our sample and experimental procedure in section (6.6.2).

6.6.1 Pre-test

Two pre-tests were conducted to ensure that the negotiation task was understandable and scorable, and that the questionnaire was understood. The first pre-test focused on the task and included 20 students from the Norwegian School of Economics and Business Administration taking a course in international management. During this pre-test feedback was gathered on the negotiating task itself, the time needed to complete it, the use of reservation points, the instructions, and the logic of the task. Based on the feedback from the students we concluded that the symmetry of the task did not make the simulation too easy and the use of reservation points tended to lower subjects' aspiration levels. Based on this information we decided that: the simulation should not have reservation points; 65 minutes allowed enough time for completion of the task in the high issue complexity conditions while not providing too much time for the other conditions; and that the symmetric structure of the task could be maintained (see Chapter 5).

The second pre-test included 30 students from The Foundation for Life Long Learning (NHHK). The subjects were randomly placed in the dyadic or group conditions and given the simulation and questionnaires. After the negotiation was complete we had a debriefing and obtained feedback on the simulation and the questionnaire. The simulation was considered believable and understandable. The simulation was corrected for language errors and the instructions were made clearer. As for the questionnaire, several questions were altered so that the dyadic and group questionnaires would be as similar as possible to the group questions.

6.6.2 Study

6.6.2.1 Sample

We recruited our sample from Norwegian business school students. We attempted to have a maximally homogenous group as recommended when the generalisations are related to theory not effects (Calder et al., 1981).

Based on previous research (Arunachalam and Dilla, 1995), expected effect size, and time and cost considerations it was deemed that a minimum of 25 dyads and groups were needed. This would ensure comparisons between groups and dyads and provide 12-15 groups in the issue complexity conditions within dyads and groups. In table 13 the sample obtained is presented.

Table 13 Sample size

	Dyads		Groups	
	Low issue complexity	High issue complexity	Low issue complexity	High issue complexity
subgroups	12	15	15	16
total	27		31	

The sample comprised 178 students recruited from three educational institutions in Norway - the Norwegian School of Economics and Business Administration (Norges Handelshøyskole), The Foundation for Life Long Learning (NHHK); The Norwegian School of Management (BI) and one placement institution for students with higher education (SYSLAB).

All students were recruited with the help of lecturers at the above mentioned institutions. Once participation was secured for a given class, the subjects were divided into male and female groups and then randomly assigned to an experimental condition.

6.6.2.2 *Procedure*

178 subjects were obtained from various classes at the institutions mentioned above. At the beginning of the class the researcher introduced the subjects to the negotiation task. The introduction was that they would be divided into groups and would be given general information regarding the negotiation. They had had 15 minutes to read through the general information.

Subjects were also told that after they finished reading the general instructions they would receive a preference sheet. This preference sheet would indicate the subject's preferences, with a number, on the different issues and alternatives. They were told that the numbers represented profit associated with the alternative, and that this profit would be earned for their department.

After the general introduction, subjects were divided into male and female groups and then randomly placed in dyads (2), and groups (4) of high or low issue complexity. Depending on the location of the data collection, the sessions were conducted in either separate rooms or separate areas within the school. Checks on data collection methods were obtained to ensure that these factors did not affect outcomes (see Chapter 7).

Once the subjects had read the general information (the issues and alternatives that were to be negotiated) the researcher handed out their individual preference sheets. Before handing these out the subjects were asked if they had any questions and were reminded that no agreement was worse than any agreement they could reach. They were also reminded that preference points represented profit to their department. They were then instructed that they had 50 minutes to complete the negotiation. After completing the negotiation they were asked to fill out the agreement they had reached, and to individually complete the questionnaire. During the negotiation the researcher was available if the subjects had any questions. No additional questions were asked. If groups were not finished 15 minutes before time was out in the

negotiation they were told they had 15 minutes to finish. Subjects were then debriefed and dismissed.

6.7 Summary

In this chapter we have described how we operationalised our theoretical constructs. The chapter began with an overview of the type of measures used and conceptual issues regarding the level of analysis and aggregation. The aim in this first section was to clarify our aggregation and general measurement choices.

Next, operationalisations of the integrative agreement (dependent variable), and the intermediate variables were presented. Issues of validity and reliability associated with these measures were also assessed. Overall, the measures were deemed reliable and as having high face validity. In the final section of this chapter our pre-tests, and our procedure were described. In the next chapter we will present the description of the data we obtained from our investigation.

Chapter 7

DESCRIPTIVE STATISTICS

This chapter examines the general quality of the data including a description of the data, and an inspection of the assumptions for the statistical methods used to test our hypotheses. The inferential statistics will be presented in Chapter 8.

The quality of the data was assessed by using descriptive statistics and frequencies to check for missing data, outliers, and out of range scores caused by incorrect data entry. The level of analysis for this study is the group level, however, as mentioned in Chapter 6 several of the variables for groups were calculated from individual scores. Data was missing for some of these individual scores and therefore we needed to assess what effect this had on the group level variables. A discussion of the missing data is therefore presented in section 7.1 (for a review of the aggregation and index issues see Chapter 6). In section (7.2) the sample demographics are summarised, followed by quality checks on the data collection method (section 7.3 & 7.4). The variables in our study are examined in detail in section (7.5) to determine their general quality and appropriateness for statistical testing. Finally, we introduce the assumptions of the statistical tests used in this study and the degree to which our data met with these assumptions.

Before presenting the descriptive statistics a brief review of the variables under investigation is required. Recall from Chapter 6 our dependent variables: the economic and social psychological measure of integrativeness and our central intermediate variables: judgement accuracy and information exchange. In this chapter and in Chapter 8 we have measured judgement accuracy with the fixed pie variable. In the reporting of the statistics we have used the label fixed pie (sum) and results should be interpreted as the more fixed pie bias in the group the less judgement accuracy. Two indices agenda and degree of organisation measure the intermediate variable, procedural structure. Problem solving will be labelled problem solving and the task requirements will be measured using the variable trading issues.

In the next sections these variables will be examined and described and the overall quality of the data will be assessed.

7.1 Missing data

Complete data were available for the group level dependent variables measured with economic scores, however data for individual items were missing for the social psychological outcome construct and the some of the intermediate variables.

For both the social psychological construct (using 5 variables) and the process variables, the missing scores accounted for less than 6% of the sample and showed no systematic differences between the conditions. The goal of treating missing data either by excluding it from analysis or by estimating the values, is to give a fair representation of the data. In this study the data set is not sensitive to individual missing data because group level variables need to be estimated when individual data is missing. In the literature deleting cases or variables is considered one of the more conservative procedures for dealing with missing data (Tabachnick and Fidell, 1983). It is often recommended to estimate the missing data. Since this study was investigating group level variables, estimations based on individual scores were used.

The treatment of missing data was based on the following considerations:

1. Group level variables composed of individual scores in which no more than 50% of the individual scores were missing were calculated with the remaining group members, using either percentages or averages.
2. If over 50% of the information were missing for the group then the case was deleted for that particular statistical test.
3. If the group score were missing on one dimension of an index, that case was deleted (all indexes were formative and therefore if one dimension was missing the case could not be included).

Recall from Chapter 6 the discussion of aggregation and indexing issues. We encounter problems when aggregating individual scores that sum to form the group measure if some of the individual scores are missing. These missing scores cannot be estimated from other group members since no correlation is assumed among group scores. However we would lose too much information if we excluded all these cases from analysis. It was therefore decided that group scores would be calculated on those individual scores available and percentages would

be used. With the social psychological dependent variable in which averages were used to indicate the degree of satisfaction in the group, the degree was based on those individuals who responded. For group level variables in which averages were considered the best estimate of the behaviour in the group, missing data was not as critical since other members scores could be used to estimated the group behaviour with only a minimal reduction in reliability.

7.2 Sample

In this section we give a general description of our sample. After visual inspection of the data no errors in the data punching were detected, however, two outliers were found. Although an experimental design was employed, an examination of the demographic data was undertaken to check that age, work experience, and education were evenly distributed in the conditions. Two extreme scores for work experience were found at the group level and it was decided to remove these cases from analysis as this demographic variable could influence our analysis and outcomes. In Table 14 summarises the sample before and after eliminating the outliers.

Table 14 Sample demographics

	Dyads				Groups		Total	
	n=29		n=27 ^a		n=31		n=58 ^a	
	Mean	sd.	mean	sd.	mean	sd.	mean	sd.
Age	26.93	3.06	25.57	6.22	26.8	4.90	26.23	5.54
Education	3.39	1.72	3.42	1.78	3.14	1.74	3.27	1.75
work experience	5.51	5.93	4.19	3.01	4.19	4.71	4.19	3.98

^a outliers removed

To control for the effects of gender an attempt was made to place subjects in all female and all male groups, however, the practical limitations imposed by the data collection method, and the need for randomisation resulted in some mixed sex negotiating units. In the dyadic condition, there were 10 female, 13 male, and 4 mixed negotiating units; and, in the group condition there were 12 female, 16 male, and 3 mixed negotiating units. Tests were run to see if male, female, and mixed negotiating units performed differentially on the negotiation tasks, and no differences were detected.

7.3 Effects of the data collection method

To ensure that collecting the data from 4 different institutions did not affect the outcome scores, ANOVAs were conducted, one for the economic outcome variable and one for the social psychological variable. The results were non-significant for both the economic outcomes; and the social psychological outcomes. The data collection method did not affect outcomes.

7.4 Effects of roles

The role the subject was playing did not significantly affect the individual outcome measured by individual profit. We examined roles to ensure that in the group condition the additional roles (marketing and production) did not reach systematically lower or higher scores than the economic and research & development roles, which were in both the dyadic and group tasks. If this had been the case the different task roles (marketing and production) could have been introduced as an alternative explanation for groups achieving lower or higher scores than dyads.

7.5 Inspection of variables

The descriptive statistics of the mean, standard deviations, skewness, kurtosis and the minimum and maximum of the variables are given. First, the independent variables, which are categorical are presented in table 15 and then the dependent variables are described in table 16. Finally, the intermediate variables, which will act as independent variables in subsequent analysis, are illustrated in table 17. Statistical analysis of these variables will be conducted on the total sample and on the sub-samples (dyads and groups). It is therefore necessary to inspect the distributions in the total and the sub-samples. Bivariate correlations of the dependent and intermediate variables for the whole sample, as well as the sub-samples, will be included in order to achieve an overview of the relationships within the data set.

Table 15 Independent variables

Dyads n=27		Groups n=31	
Low issue complexity	High issue complexity	Low issue complexity	High issue complexity
12	15	15	16

For the dependent variables listed in table 17 high quality data is reflected in the scores. For the regression analysis normal distributions of the dependent variables are necessary. If the variable is too skewed (scores are concentrated at one end of the distribution with only a few scores sparsely spread along the opposite tail) and /or the distributions have too sharp or blunt peaks (kurtosis) then we cannot assume the dependent variable is normally distributed. As a rule of thumb kurtosis scores above 2 suggest that we have a problem with the variable. For skewness a value of 0 indicates a normal distribution so we can use a z-test to determine if the skewness reported is significantly different from 0 or we can also use the rule of thumb that scores above 1 are problematic. Skewness reported below is represented by the statistic, and not the z score. Scores over 1 indicate potential problems with the variable. In addition, z scores were calculated, although not reported, to ensure the rule of thumb was correct and no z-scores were significant. In the tables below we note that all dependent variables appear to be normally distributed in the sample and the sub-samples and no outliers are detected through the examination of the minimum and maximum scores.

Table 16 Descriptive statistics for the dependent variables

Variables	N	mean	sd.	skewness	kurtosis	min	max
<u>Total sample</u>							
Economic	58	76.05	8.96	.253	-.348	64.35	100
Social psych.	57	0	1	.179	-.211	-2.15	2.16
<u>Dyad sub-sample</u>							
Economic	27	78.51	8.82	-.045	.286	64.35	100
Social psych.	26	.372	1.18	-.288	-.713	-2.15	2.16
<u>Group sub-sample</u>							
Economic	31	73.89	8.64	.588	-.199	64.35	96.21
Social psych.	31	.312	.702	-.483	-.01	-2.10	.93

In the next table the intermediate variables are examined for normality of distribution so that the analysis which treats them as independent and dependent variables can be undertaken. From examination of the table we observe that the only variables that violate the assumption of normality are trading issues (marginally in group sub-sample) and degree of organisation in the dyad sub-sample. Caution is therefore required when interpreting the results associated with these variables.

Table 17 Descriptive statistics for the intermediate variables

Variables	N	mean	sd.	skewness	kurtosis	min	max
<u>Total Sample</u>							
Agenda	57	11.28	2.90	.676	.360	5	19
degree of organisation	58	4.52	1.64	.926	1.22	2	10
fixed sum error	57	40.49	35.69	.217	-1.27	0	100
trading issues	58	2.35	1.36	.628	-969	1	5
information about priorities	58	58.19	39	-.370	-1.348	0	100
problem solving	58	3.22	.80	-.06	.252	1	5
<u>Dyadic sub-sample</u>							
Agenda	26	10.98	3.50	.753	.219		
degree of organisation	27	4.194	1.811	1.585	3.263		
fixed sum error	26	13.46	22.62	1.11	-.850		
trading issues	27	2.667	1.454	.240	-1.353		
information about priorities	27	46.296	43.69	.151	-1.712		
problem solving	27	3.407	.9611	-.453	.055		
<u>Group sub-sample</u>							
Agenda	31	11.533	2.34	.858	.009		
degree of organisation	31	4.798	1.437	.325	-.328		
fixed sum error	31	63.1613	28.06	-.291	-.742		
trading issues	31	2.08	1.23	1.04	-.094		
Information about priorities	31	68.548	31.601	-.747	-.470		
problem solving	31	3.05	.5967	-.066	.397		

Bivariate correlations were also examined and are presented for both the (economic and social psychological) dependent variables and joint profit in tables 19 and 20 below. In order to

assess the relationship between the Nash economic criteria and the more common measure, joint profit, evaluation of the data included reporting joint profit. As we can see in the table these two measures are highly correlated. The social psychological measure is also highly correlated with the economic measure indicating a relationship between group economic outcome and the social psychological outcome.

Table 18 Bivariate correlation of the dependent variables

	<i>Economic</i>	<i>Social Psychological</i>	<i>Joint Profit^a</i>
<u>Total sample</u>			
Economic	1.00		
Social Psychological	.361**	1.00	
Joint Profit ^a	.869**	.423**	1.00
<u>Dyadic sub sample</u>			
Economic	1.00		
Social Psychological	.235	1.00	
Joint Profit ^a	.872**	.370*	1.00
<u>Group sub-sample</u>			
Economic	1.00		
Social Psychological	.419**	1.00	
Joint Profit ^a	.848**	.379*	1.00

^a Includes impasses which are given a compromise solution

* correlation significant at the $p < .05$ and ** correlation significant at the $p < .01$ (both 1-tailed)

By inspecting the data we observe that in the total sample correlations between the social psychological and economic variables are significant. In the sub-samples these significant relationships are not maintained. At this early stage the data reveals that different mechanisms may be working in dyads and groups.

Table 19 illustrates the correlations between the intermediate variables. We note that there are differences in dyads and groups between intermediate variables which are significantly correlated. In dyads the two measures, degree of organisation and sharing of priority of information, were significantly correlated but not in groups.

Table 19 Bivariate correlations of the intermediate variables

	agenda	degree of organisation	fixed sum error	Trading issues	Information about priorities	problem solving
Total sample						
Agenda	1.00					
Degree of organisation	.263*	1.00				
Fixed sum error	-.189	.301*	1.00			
Trading issues	.622**	-.015	-.445**	1.00		
Information about priorities	.271*	.462**	.161	.069	1.00	
Problem solving	.244	.302*	-.156	.137	.129	1.00
Dyadic sub-sample						
Agenda	1.00					
Degree of organisation	.298	1.00				
fixed sum error	-.175	.299	1.00			
trading issues	.651**	.055	-.313	1.00		
information about priorities	.271	.562**	.083	.040	1.00	
problem solving	.280	.367*	-.108	.094	.289	1.00
Group sub-sample						
agenda	1.00					
degree of organisation	.181	1.00				
fixed sum error	-.551**	.172	1.00			
trading issues	.684*	-.011	-.481**	1.00		
information about priorities	.229	.241	-.246	.282	1.00	
problem solving	.261	.352*	.088	.093	.051	1.00

• correlation significant at the * $p < .05$ and ** $p < .01$ (2-tail)

The above table will be referred to in the next section when the assumptions for the statistical are tested.

One final inspection of the data is required. Since there has been a substantial amount of research on the fixed pie bias in dyads we would like to investigate the expected correlations of this variable with outcome scores. Although the findings are more equivocal for priority

information exchange we would also like to investigate this variable's relationship to outcomes. The other intermediate variables will also be presented.

Table 20 Bivariate correlations of the intermediate and the dependent variables

	Nash solution	Social Psychological outcome	Joint profit	Joint Profit with impasses
<u>Total sample</u>				
agenda	.498**	.353**	.558**	.547**
degree of organisation	.178	.146	.383**	.312**
fixed sum error	-.289*	-.283*	-.314*	-.308**
trading issues	.462**	.344**	.473**	.476**
information about priorities	.017	.008	.179 ^a	.097
problem solving	.276*	.619**	.212	.255*
<u>Dyadic sub-sample</u>				
agenda	.732**	.563**	.713**	.755**
degree of organisation	.218 ^a	.335*	.571**	.483**
fixed sum error	-.201	-.233 ^a	-.102	-.109
trading issues	.506**	.508**	.322 ^b	.453**
information about priorities	.193	.212 ^a	.381*	.350*
problem solving	.031	.567**	.217	.083
<u>Group sub-sample</u>				
agenda	.359*	.072	.416*	.391*
degree of organisation	.265 ^b	.049	.308 ^b	.263 ^b
fixed sum error	-.073	.091	-.360 ^b	-.197 ^a
trading issues	.355*	-.033	.598**	.437**
information about priorities	-.014	-.083	.056	-.021
problem solving	.508**	.659**	.247 ^a	.408*

* correlation significant at the ^a p<.15, ^b p<.10 *p<.05 and ** p<.01(1-tailed)

Expected relationships predicted from the negotiation research for the commonly used dependent variables (joint profit) were supported in the total sample. However, in the sub-sample, correlations exhibited some deviations from the relationships expected. The sample size is reduced when examining the sub-samples and therefore correlations will have to be

stronger to reach significance at the traditional levels ($p < .05$). We have therefore also noted correlations that are significant at $p < .15$ and $p < .10$ which indicate that the relationship is present and in the expected direction. Most of the negotiation research has used joint profit and has reported negative correlations between the fixed pie bias and joint profit. From table 20 we note that this relationship holds in the total sample and is in the right direction for both dyads and groups although the dyads do not show a strong correlation ($r = -.102$) between these variables. The relationship between information sharing and joint profit has received equivocal findings in the negotiation research. From table 20 we note that sharing information on priorities is related to outcomes in the total sample (marginally) and in the dyadic sample (significantly $p < .05$) but not in the group sample.

The other intermediate variables agenda, degree of organisation, trading issues and problem solving were also examined. Agenda was deemed an important variable because of its effect on outcomes. In the total and the sub-samples it was significantly and positively correlated with all the economic outcome measures. These findings are consistent with the negotiation research where agenda has been manipulated (cf. Weingart et al., 1993). In groups the agenda was not positively related to the social psychological outcome measure. Previous research findings show a positive relationship with agenda and joint profit, this correlation was also found in our data. The degree of organisation is theoretically postulated to be positively related to outcomes. This was supported for the joint profit measures across the total sample and the sub-samples and marginally supported in the dyadic conditions. In the group sub-sample degree of organisation was not linked to the social psychological measure.

Problem solving in the total sample was positively correlated with all the outcome measures, although not significantly correlated with joint profit. The relationships for this variable are all in the proposed direction. However, the expected relationship between problems solving and outcomes was not maintained in the dyadic sub-sample. In the group sub-sample the relationship between problem solving and outcome measures was significant and in the predicted direction.

Finally, trading issues was correlated with all the economic outcomes, as would be expected considering the task requires this behaviour, however in groups trading issues did not appear to be related to the social psychological outcomes.

By examining table 20 we note that our data set exhibits similar correlations to previous research (e.g. fixed sum-joint profit, agenda-joint profit). The correlations in our study that differ from previous research, only differ in terms of significance, not direction. It should be noted that with these variables (information sharing about priorities, problem solving), results have been equivocal or sparse (degree of organisation). In the next section we present the analyses chosen to examine our research question and whether our data set meets the requirements for these tests.

7.6 Analysis choices and assumptions

In this section we present the choice of analyses we used for our data and the assumptions that the data had to meet. Statistical tests are built on mathematical models, which assume that the data has certain properties. The assumptions regarding the data must be examined so that we can trust and interpret the results we obtain from the statistical tests. Many of the statistical models are robust to violations of some of the assumptions. In sections 7.6.1-7.6.3 we outline the degree to which our data quality matches the requirements of the statistical tests chosen, and discuss the implications if any violations discovered. The degree and type of violation should be included in discussions of the results so that we can analyse the potential impact on the interpretation of the findings.

The choice of analysis techniques is determined by the research question, and the number, type (non-metric or metric), and quality of variables under investigation. Our research questions involve testing for the significance of group differences and testing for relationships of the intermediate and outcome variables within dyads and groups. These considerations determine the group of tests available for our use and once we have chosen the procedures that fit our data, we must ensure that the quality of the data allows us to use these analytical techniques.

For hypotheses 1a and 1b the independent variable is non-metric (people complexity) and the dependent variables are metric (economic and social psychological outcomes). The two dependent variables, although correlated, represent different dimensions of quality and therefore we can argue that running two *t*-tests is appropriate. Recall that our hypotheses are unidirectional and therefore require a one tail not two tail test.

For hypotheses 1c-1f *t*-tests were conducted (non-metric-information level -variable and metric outcome variables). Again we had directional hypotheses and the dependent variables represent conceptually different aspects of quality outcomes. A two way ANOVA was also run to inspect for interaction effects between people and issue complexity.

For hypotheses 2a-2c a MANOVA was required as the independent variable (people complexity: non-metric) was postulated to have an effect on the intermediate variables (metric). Conceptually, these variables are expected to be related to one another, and therefore a MANOVA was chosen. For hypotheses 2d-2g *t*-tests were run.

For research questions 3 a contextual multiple regression was suitable to understand the processes within dyads and groups. For these research questions the intermediate variables became the independent variables (metric) and the economic and social psychological variables remained the outcome measures (metric). The sub-samples, groups and dyads, provided the context. By using this technique, differences in processes between dyads and groups could be compared. An option to running contextual analysis on sub-samples would have been to run a multiplicative regression model entering group and dyads as the dummy variable. However, contextual regression is a better choice because it is easier to interpret, appropriate when we have only two sub-samples, and provides a more parsimonious picture of the results.

The statistical techniques that will be used for our investigation are: *t*-test, ANOVA, MANOVA, and contextual multiple regression. In order to use these techniques certain assumptions regarding our data and variables need to be met. In the next section we will comment on the degree to which these assumptions have been fulfilled.

7.6.1 Testing the assumptions of the *t*-test and the ANOVA

The first set of hypotheses investigated how the people complexity of the negotiation task (a categorical variable) affected the outcomes of a negotiation (interval variable). We then examined how issue complexity affected outcomes within dyads and groups. When testing the differences between two means the appropriate analysis technique is a *t*-test. Both the economic and social psychological dimensions of an integrative agreement are postulated to be related but represent different dimensions of an integrative agreement. These outcome

variables are considered theoretically separate but linked dimensions. A two-way ANOVA was run to check for possible interaction effects between people and issue complexity. In order to ensure the appropriateness of using a *t*-test and the ANOVA the following assumptions had to be met:

1. independence;
2. normal distribution of scores for treatment populations; and,
3. homogeneity of variance (Shavelson, 1981).

The independence assumption requires that the score for any one subject is independent of the scores of the other subjects; i.e. the score should supply unique information about the treatment effect (Shavelson, 1981). This assumption is usually met by using an experimental design with random assignment to treatment conditions (Keppel, 1982). In the present study subjects were assigned to groups and dyads randomly and to high and low issue complexity conditions.

The second assumption demands that scores within each treatment population be normally distributed. In general, the *t*-test and ANOVA are not sensitive to violations of normality for an independent variable with a fixed number of levels (Shavelson, 1981). Checking the normality of the variables can be accomplished by examining the skewedness and kurtosis of the distributions. It was found that the skewedness for both dependent variables was not significantly different from 0 (skewness scores of under 1), and that the kurtosis scores were under 2, indicating that the normality assumptions were not violated. Also the assumption of normality for an ANOVA refers to the sampling distribution and therefore the central limit theorem guards against problems with normality when the sample size used is large and there are approximately an equal number of cases in the groups (Tabachnick and Fidell, 1983).

The third assumption, that variances in the two groups should be equal, is robust to violations when cell sizes are equal (Shavelson, 1981). Although cell sizes were not strictly equal they were approximately equal and only if the cell sizes are very different (e.g. 3 to 1) should non-parametric tests be used (Shavelson, 1981). Levene tests revealed that the homogeneity of variance assumption was not violated for the economic dependent variable, but was violated for the social psychological variable. Although the *t*-test and ANOVA are robust with respect to this violation, to be conservative we ran significance tests with equal cell sizes (randomly excluded 5 group cases) and ran a non-parametric Mann-Whitney test. In both instances our

results were still significant. We therefore believe that although this assumption has been violated it does not increase the probability of committing a Type I error. Within dyad and group conditions the assumptions of ANOVA were met.

For the second group of hypotheses the intermediate variables became the dependent variables and needed to be examined for homogeneity of variance and the normality of distribution. The homogeneous variance tests generally revealed no significant deviations, and since cell sizes were almost equal, ANOVA should be robust to these violations. Normality of the hypothesised intermediate variables is shown in table 17. Independence was assumed since randomisation to the group or dyad condition was conducted. In summary, for our various hypotheses, the quality of our data was sufficient to run *t*-tests and ANOVAs and to be confident in our findings.

7.6.2 Testing the assumptions of the MANOVA

A MANOVA was chosen to examine the differences in the intermediate variables between the group and dyadic conditions. The MANOVA is the appropriate statistical technique to use because the intermediate variables, which have become the dependent variables, are related. These variables are not really independent since the information was obtained from the same individuals using the same self-report questionnaire. A MANOVA protects against Type I errors, which increase if multiple one way ANOVAs are run. The assumptions of a MANOVA are homogeneity of variance for each dependent variable, homogeneity of variance-covariance matrices, and multi-normally distributed dependent variables (Haire et al., 1992). A MANOVA test also requires that there are more cases than dependent variables otherwise the power of the test will be lowered and the test for homogeneous variances cannot be conducted (Tabachnick and Fidell, 1983). This requirement was met.

The first assumption of the homogeneity of variance for the dependent variables was tested using the Levene statistic. Results indicated that there were violations for 2 of the intermediate variables (acting as dependent variables): Priority information sharing and problem solving in the group. However, Tabachnick and Fidell (1983) state that the analysis is robust to a violation of this assumption provided there are no outliers in the cells. They go so far as to state that one need not even test for this violation as long as the ratio between the largest and smallest sample size is no more than 4:1 and the ratio between largest and

smallest variance is no greater than 20:1. Examining our data we determined that although the assumption was violated it should not impact on the interpretation of our results since we have no outliers, our sample size ratio is 1.2:1, and our variance ratio was much less than 20:1.

Running Box's M test of equality of covariance checked assumption 2. Results indicated that this assumption was not violated. Assumption 3 regarding multivariate normality can be checked by examining univariate normality. Although univariate normality gives no assurance of multivariate normality the probability of multivariate normality is increased if all the variables have normal distributions. Our intermediate variables reveal normal distributions (see table 17). Mardia (1971), quoted in Tabachnick and Fidell, (1983) illustrates that MANOVA is robust to modest violations of normality if the violation is created by skewness rather than by outliers. Tabachnick and Fidell (1983) also conclude that a sample size of around 20 in the smallest group should ensure robustness with a few dependent variables. Based on the sample size, the general normality of distribution, modest violations should not prevent the use of MANOVA.

In summary, the quality of the data meets the requirements of the MANOVA.

7.6.3 Testing the assumptions of multiple regression

The multiple regressions were run for the two sub-samples, the dyads and the groups of 4 parties. It was therefore necessary to check that the assumptions of the regression were met in both sub-samples. A simultaneous multiple regression was chosen to analyse the data. The simultaneous or standard regression strategy enters all of the independent variables into the equation at the same time. By using this type of multiple regression strategy each independent variable can be judged by what it contributes to the prediction of the dependent variable beyond the predictability provided by the other independent variables (Tabachnick and Fidell, 1983).

Before conducting multiple regression there is a suggested minimum requirement of 4 to 5 times more cases than independent variables (Tabachnick and Fidell, 1983). In our sub-samples we met this prerequisite.

Through examining our data we found that the assumptions for running multiple regression were generally met. Multicollinearity diagnostics were conducted and the variables fell within acceptable VIF (variance inflation factor) ranges. Normal distribution of residuals was checked and although in the dyadic sub-sample the distribution of the residuals appeared as if they deviated, it was not a sufficient violation to justify transforming the data. Due to the high R^2 and the significance of the coefficients we can feel safe that the significant intermediate variables we found, do contribute substantially to the outcomes.

7.7 Other descriptive information

In table 21 the economic outcome scores for dyads and groups is presented. These outcome scores are inclusive and exclusive of impasses. In the negotiation literature joint profit is often used as the measure of an integrative agreement, therefore we have presented the scores on this measure for inspection. Also included is the quality of the agreements reached (scores not including impasses) and quality of outcome (where impasses are assigned a compromise score). We have already argued for the Nash solution, inclusive of impasses, as the most accurate representation of high or low quality scores, however for background information we present table 21.

Table 21 Other outcome measures for the dependent variables

	Quality of agreements reached		Quality of outcomes		
	Nash without impasses	Joint profit without impasses	Nash with impasses	Joint profit with impasses at 75	impasses
<u>Dyads</u>					
low information	81.62	83.98	80.13	83.22	2
high information	80.39	81.37	77.18	80.09	3
<u>Groups</u>					
low information	76.95	78.47	73.58	77.54	4
high information	80.02	82.03	74.18	79.39	6

We note from the table above that Nash and Joint profit give similar results in the different conditions. We also note that by including impasses in measuring the quality of outcomes affects group scores in the higher issue complexity condition, most. We have combined dyads in the two issue complexity conditions and groups in the two issue complexity conditions, to achieve an understanding of the differences and similarities between dyads and groups: our

central research question. To reiterate the two different tasks with varying issue complexity allows us to examine the differences between dyads and groups across tasks, as well as investigate the effects within dyads and groups of increases in the issue complexity.

7.8 Summary

In this chapter we have described our data, and shown that it has met the requirements for our statistical tests. We can now use the statistical tests outlined in this chapter to test our hypotheses. Our inferential statistics will be presented in Chapter 8.

Chapter 8

HYPOTHESES TESTING

The aim of this dissertation is to test the causal relationships predicated by the negotiation and decision theory. The hypotheses presented in Chapter 3 represent these relationships. Our choice of an experimental design allows us to draw causal inferences from our results, and thus test our hypotheses. Using statistical methods we can determine the degree to which differences in negotiation outcomes (or the intermediate variables) are attributable to the manipulation of complexity or attributable to chance. By using randomisation to the different levels of complexity, we rule out differences in the outcome based on initial differences between the two samples. When we know the null hypothesis is true (the samples should not differ systematically before the experimental manipulation is administered) we are able to state how probable a difference-of-means of a certain size occurred simply by the vagaries of the randomisation alone. The significance test tells us whether we are able to draw causal inferences. We cannot, with our model generalise to other conditions or individuals, but we can determine the probability whether relationships occurred in our research by manipulation or by chance.

In this section the hypotheses proposed in Chapter 3 will be tested using 4 inferential statistical methods: *t*-test, ANOVA, MANOVA, and multiple regression analysis.

In this chapter we present the results of the hypotheses testing in the order of the research questions. Before the hypotheses are presented we will present some general findings regarding the data. Discussion of the results will be saved for chapter 9.

8.1 General findings

Recall from Chapter 6 that impasses were included in the economic outcome variable by assigning impasse groups the low score for the sample. In Chapter 7 we presented the number of impasses in the various conditions in table 22. The number of impasses that occurred in the dyadic and group conditions was 4 and 10 respectively. In dyads 15% of the units did not reach an agreement and in the groups 32% of the units did not reach an agreement. Although no agreements were prevalent in the group condition no statistically significant difference

between the number of impasses in dyads and groups was found. More impasses in the group condition lowered the overall economic measure of an integrative agreement however, we have stated explicitly in Chapter 6 that no agreement is the lowest quality outcome in our simulation. Therefore, our measures do reflect the overall quality of outcomes in the negotiation simulation.

We will now present the results of our hypotheses testing in the order of our research questions.

8.2 RQ1

Do increases in objective task complexity cause decreases in the quality of outcomes in a negotiation?

We defined complexity in terms of people and issues. Recall that the first hypothesis proposed was:

H1a: As people complexity increases, the negotiating unit's economic outcomes will decrease.

Consistent with this hypothesis, increases in people complexity led to lower outcomes. Dyads achieved higher economic outcomes than groups, $t=2.01$, ($df=56$), $p<.05$, one tail.

H1b: As people complexity increases, the negotiating unit's social psychological outcomes will decrease.

Again, dyads had higher scores than groups on the social psychological measure, $t=2.727$ ($df=55$) $p<.0.1$, one tail. As mentioned earlier homogeneity of variance for the social psychological measure was violated, therefore additional analysis (Mann-Whitney U test) was undertaken to ensure that this violation did not affect the significance testing. Results from this additional test showed that the difference between dyads and groups was significant. For the social psychological outcome a check of the distribution of benefit was attempted. Our main aim was discover if there were differences between dyads and groups in their distribution of social psychological benefit. It was found that there was more variance in dyads than in groups. These results are inconclusive since a possible explanation of this greater variance could be that dyads contain fewer units.

For the following hypotheses no significant differences were found:

H1c: Within dyads, as issue complexity increases, economic outcomes will decrease.

H1d: Within groups, as issue complexity increases, economic outcomes will decrease.

H1e: Within dyads, as issue complexity increases, social psychological outcomes will decrease.

H1f: Within groups, as issue complexity increases, social psychological outcomes will decrease.

A two way ANOVA was also run to check for interaction effects between people and issue complexity, and no significance was detected.

From RQ1 we found support that people complexity affected both economic and social psychological outcomes, but that issue complexity had no effects on outcomes in dyadic or group conditions.

8.3 RQ2

Do increases in objective task complexity affect the variables that emerge in the negotiation process?

To test the group of hypotheses associated with this research question a MANOVA statistical procedure was chosen. Recall that our focus is on the people complexity dimension of objective task complexity. Before examining the statistical tests related to our specific hypotheses we ran a MANOVA on the 6 intermediate variables. Overall differences between intermediate variables in groups and dyads was found, (Wilks Lambda (.694) and Pillai's trace (.306), both at $p=.005$): see table 22.

Table 22 Effect of people complexity on the intermediate variables.

test name	value	DF	Error DF	sig. of F
Wilks	.385	6	49	.000
Pillai's trace	.615	6	49	.000
Hotellings- T	1.598	6	49	.000

In table 23 we can examine the univariate *F-tests* generated from our MANOVA, to test our next group of hypotheses.

H2a: As people complexity increases priority information sharing will decrease.

We observe that no support was found for hypothesis H2a, and in fact that the findings are in the opposite direction than hypothesised.

H2b: As people complexity increases, fixed pie error will increase.

From table 23 we see that support for H2b is found (the higher the score the more fixed pie bias).

H2c: As people complexity increases, problem solving behaviour will decrease in the negotiating unit.

The univariate test did show differences in problem solving although only marginally significant, ($p=.098$), with dyads reporting more problem solving behaviour than groups. The other variables are also listed in table 23 and show no significant differences.

Table 23 Univariate F-tests for the Intermediate variables

Intermediate variables	Dyads	Groups	F
Fixed Sum			52.76**
Mean	13.46	63.16	
<u>sd</u>	22.61	28.06	
<u>n</u>	26	31	
Priority Information Sharing			5.028 ^a
mean	46.30	68.55	
<u>sd</u>	43.69	31.60	
<u>n</u>	27	31	
Agenda			.505
mean	10.98	11.53	
<u>sd</u>	3.50	2.34	
<u>n</u>	26	31	
Degree of structure			2.00
mean	4.19	4.80	
<u>sd</u>	1.81	1.43	
<u>n</u>	27	31	
Problem Solving			2.96 ^b
mean	3.41	3.05	
<u>sd</u>	.96	.60	
<u>n</u>	27	31	
Trading Issues			2.74
mean	2.67	2.08	
<u>sd</u>	1.45	1.23	
<u>n</u>	27	31	

^a $p < .10$ (2 tail), opposite direction than predicted. ^b $p < .10$ (1 tail). ** $p < .001$ (2 tail).

The next set of hypotheses is related to issue complexity within dyads and groups.

H2d: As issue complexity increases within dyads, priority information sharing will decrease.

H2e: As issue complexity increases within groups, priority information sharing will decrease.

H2f: As issue complexity increases within dyads, fixed pie error will increase.

H2g: As issue complexity increases within groups, fixed pie error will increase.

There was no support found for hypotheses H2c-H2f. Issue complexity had no effect on information or fixed pie bias in dyads or groups. These non-findings will be discussed in Chapter 9.

8.4 RQ3

Do the intermediate variables that lead to high quality outcomes differ between groups and dyads?

In this section the overall regression models for the dyadic and group sub-samples will be presented first. For the group and dyadic sub-sample the intermediate variables' effects on both the economic and the social psychological outcomes variables will be reported. Next a summary of the differences and similarities between dyads and groups will be introduced, and lastly the results of the directional hypotheses will be given. Two sub-sample multiple regression analyses were performed to examine which intermediate variables lead to integrative agreements in dyads and groups. For this research question these variables are treated as independent variables.

8.4.1 Sub-sample regressions

Table 24 shows the results for the effect of the intermediate variables on the economic outcomes in the dyadic condition. The overall model had an $F_{6,18}=7.78$, $p<.001$ and an adjusted R^2 of .630. The 6 intermediate variables chosen appear to explain a large percentage of the outcome variance. The intermediate variables that have a significant impact are, the agenda the time used organising.

Recall that the tests of the regression model assumptions for the dyadic condition revealed some problems with the distribution of residuals. In addition, there is a small ratio of cases to variables. Caution should be used when interpreting the degree of explanatory strength, and

generalisability of this model. Since the findings are so strong we can be confident in the variables identified as important, and the significance of the overall model.

Table 24 Multiple regression analysis for dyads: Economic outcome

Independent variables	B	Beta	t	Sig
FIXED SUM ERROR	-.00244	-.065	-.469	.645
PRIORITY INFORMATION	.02311	.121	.198	.421
AGENDA	1.282	.556	3.08	.006
DEGREE OF ORGANISATION	1.964	.401	2.53	.021
PROBLEM SOLVING	-2.36	-.288	-2.061	.054
TRADING ISSUES	.669	.121	1.03	.492
adjusted R^2	.630			

Model	Sum of squares	df	mean square	F	Sig.
Regression	1147.929	6	199.321	7.79	.000
Residuals	441.547	18	24.530		
Total	1589.476	24			

In table 25 the results are shown for the effect of the intermediate variables on the economic outcomes for the group condition. An adjusted R^2 of .241 was obtained and the intermediate variable that is significant is, problem solving. The model has an $F_{6,24}=2.586$, $p<.045$.

Table 25 Multiple regression analysis for groups: Economic outcome

Independent variables	B	Beta	t	Sig
FIXED SUM ERROR	-.000765	-.002	-.012	.991
PRIORITY INFORMATION	-.00491	-.179	-1.021	.317
AGENDA	.0589	.016	.062	.951
DEGREE OF ORGANISATION	.965	.160	.857	.400
PROBLEM SOLVING	6.144	.424	2.382	.026
TRADING ISSUES	2.5	.356	1.558	.132
adjusted R^2	.241			

Model	Sum of squares	df	mean square	F	Sig.
Regression	881.137	6	146.856	2.59	.045
Residuals	1363.147	24	56.798		
Total	2244.284	30			

The intermediate variables, which affected social psychological outcomes in dyads, are presented in table 26. This regression model was significant, $F_{6,17} p=.009$ and the adjusted $R^2 = .451$. We note that reported problem solving was positively and significantly related to social psychological outcomes in dyads ($t=2.62, p=.018$) which is opposite to its relation for economic outcomes.

Table 26 Multiple regression analysis for dyads: Social psychological outcome

Independent variables	B	Beta	t	Sig
FIXED SUM ERROR	-.00823	-.151	-.874	.394
PRIORITY INFORMATION	-.00414	-.146	-.782	.445
AGENDA	.04.821	.085	.568	.577
DEGREE OF ORGANISATION	.105	.146	.701	.493
PROBLEM SOLVING	.553	.461	2.623	.018
TRADING ISSUES	.282	.346	1.489	.155
adjusted R^2	.451			

Model	Sum of squares	df	mean square	F	Sig.of F
Regression	19.881	6	3.314	4.151	.009
Residuals	13.570	17	.798		
Total	33.451	23			

The intermediate variables which affected social psychological outcomes in groups are presented in table 27. This regression model was significant, $F_{6,24} p=.009$ and that $R^2 = .357$. Reported problem solving was positively and significantly related to social psychological outcomes for groups ($t=4.55, p=.000$) similar to its relation to economic outcomes.

Table 27 Multiple regression analysis for groups: Social psychological outcome

Independent variables	B	Beta	T	Sig
AGENDA	-.00785	-.026	-.110	.913
DEGREE OF ORGANISATION	-.00968	-.198	-1.151	.261
FIXED SUM ERROR	-.0000313	-.001	-.006	.995
PROBLEM SOLVING	.876	.745	4.547	.000
TRADING ISSUES	-.0418	-.073	-.349	.730
PRIORITY INFORMATION	.00105	-.047	-.293	.772
adjusted R^2	.357			

Model	Sum of squares	Df	mean square	F	Sig.
Regression	7.179	6	1.196	3.774	.009
Residuals	7.608	24	.317		
Total	14.787	29			

8.4.2 Differences between dyads and groups

In table 28 comparisons between the dyadic and group conditions are shown for the economic and social psychological outcome variables. Although differences are evident between the dyads and groups, in order to claim that the intermediate variables that are critical for dyadic outcomes are significantly different from those variables that are critical for group outcomes *t*-tests (Hardy, 1993). This section will begin with a comparison of the economic outcomes, then the social psychological outcomes, and finally comments will be made on the overall models.

The effect of the intermediate variables on the economic outcomes differs between dyads and groups. As shown in table 28, the indicators of procedural structure contribute significantly to dyadic economic outcomes but not to group economic outcomes. Although these variables are important for dyadic outcomes, they were not significantly more important for dyads than for groups. A significant difference between the group and dyadic conditions was only found between the coefficients for problems solving ($t=3.029$ $p<.01$). Problem solving contributes significantly to economic outcomes for groups but in dyads problem solving is negatively related to economic outcomes.

The effect of the intermediate variables on the social psychological outcomes between dyads and groups showed few differences. Although the regression equation differed slightly, both

dyads and groups had the problem solving variable significantly related to outcomes. There were no significant differences between dyads and groups on this outcome variable.

Table 28 Comparing Dyads and Groups

Variable	ECONOMIC		SOCIAL PSYCHOLOGICAL	
	Dyadic outcomes BETA (T SIG)	Group outcomes BETA (T SIG)	Dyadic outcomes BETA (T SIG)	Group outcomes BETA (T SIG)
FIXED SUM ERROR	.065 (.645)	-.002 (.991)	.151 (.394)	-.001 (.995)
PRIORITY INFORMATION	.121 (.492)	-.179 (.317)	.146 (.445)	-.047 (.772)
AGENDA	.556 (.006)**	.016 (.951)	.085 (.577)	-.026 (.913)
DEGREE OF ORGANISATION	.401(.021)*	.160 (.400)	.146 (.493)	-.198 (.261)
PROBLEM SOLVING	-.288(.054)*	.424 (.056)*	.461 (.018)*	.745 (.000)**
TRADING ISSUES	.121(.492)	.356 (.132)	.346 (.155)	-.073 (.730)
Adjusted R ²	.630	.241	.451	.357

** $p < .001$ * $p < .05$ ^a $p < .10$

Finally, the amount of variation explained by the 6 process variables was higher for dyads than for groups for both the economic and social psychological outcomes. However, these differences were not statistically different.

A discussion and possible explanations will be presented in Chapter 9. In the next section the directional hypotheses will be examined. It should be reiterated that these hypotheses are more tentative.

8.4.3 Differences between dyads and groups: Specific hypotheses

H3a: Procedural structure will be more important for groups to achieve high economic outcomes than for dyads.

From table 28 we can deduce that procedural structure (defined by the variables of agenda and degree of organisation) was significant for dyadic economic outcomes, but not for groups. These results are in the opposite direction of our hypothesis.

H3b: Information sharing about priorities will be less important for groups to achieve high economic outcomes than for dyads.

No support was found for hypothesis 3b. Neither in dyads nor in groups did information exchange contribute to economic or social psychological outcomes. This hypothesis was not supported.

8.5 Summary

In table 29 is a summary of all the hypotheses and whether they received support. In Chapter 9, we will discuss our results and examine what our findings can tell us about dyadic and group negotiation. Possible explanations and implications of our results will also be evaluated.

Table 29 Summary of the findings

Hypotheses	
H1a: As people complexity increases, the negotiating unit's economic outcomes will decrease.	✓
H1b: As people complexity increases, the negotiating unit's social psychological outcomes will decrease.	✓
H1c: Within dyads as issue complexity increases, economic outcomes will decrease.	
H1e: Within dyads as issue complexity increases social psychological outcome will decrease.	
H1d: Within groups as issue complexity increases, economic outcomes will decrease.	
H1f: Within groups as issue complexity increases, social psychological outcomes will decrease.	
RQ2 Do increases in people complexity affect the variables that emerge in the negotiation process?	✓
H2a: As people complexity increases, priority information sharing will decrease.	
H2b: As people complexity increases, fixed pie error will increase.	✓
H2c: As people complexity increases, problem solving behaviour will decrease in the negotiating unit.	✓
H2d: As issue complexity increases within dyads, priority information sharing will decrease.	
H2e: As issue complexity increases within groups, priority information sharing will decrease.	
H2f: As issue complexity increases within dyads, fixed pie error will increase.	
H2g: As issue complexity increases within groups, fixed pie error will increase.	
RQ3 Do the intermediate variables that lead to high quality outcomes differ between groups and dyads?	✓
H3a: Procedural structure will be more important for groups to achieve high economic outcomes than for dyads.	
H3b: Information sharing about priorities will be less important for groups to achieve high economic outcomes than for dyads.	

✓ = Full support ✓ = marginal support $p < .10$

CHAPTER 9

Discussion and Implications

In this chapter we will discuss the results found in Chapter 8. We begin in section (9.1) with our overall conclusions based on the results. In section (9.2) the findings are discussed in detail with an examination of significant and non-significant results, as well as, possible explanations. In section (9.3) we summarise what can be said about the findings in light of current research.

Chapter 10 will examine the overall strengths, limitations, and implications for managers, as well as for future research.

9.1 Overall conclusions

Groups are a fact of organisational life. Research on groups is mixed and complicated with, groups sometimes performing well and other times not. To learn how to manage groups in organisations it is essential that the types of tasks they engage in are specified, and that the factors that lead to high or low performance on these types of tasks are identified. We have argued that many tasks found in organisations can be classified as a negotiation. Extensive research within the negotiation field has led to the development of decision aids that can improve performance on negotiation tasks. Unfortunately, few studies have investigated groups and hence most of the existing negotiation research is based on dyads. Can we use this research on dyads and apply it to groups in order to improve group performance?

Although no empirical investigation has directly compared dyads and groups, the theoretical literature states that groups will have more problems than dyads in reaching high quality outcomes. Recall from Chapter 1 and 2 that high quality outcomes in a negotiation can be measured by the integrativeness of an agreement. By using this outcome measure, dyads and groups can be compared and it can be examined whether groups do have more problems reaching an integrative agreement. Similarities and differences between dyads and groups can also be investigated, so that we can learn which prescriptions from the dyadic literature can be applied to groups.

In order to understand groups in organisations, groups that engage in negotiation activities, it is first necessary to determine whether outcomes between groups and dyads differ. Our main interest in this study was to investigate the differences between dyadic and group negotiations. The aim was to empirically test whether dyads achieved more integrative agreements than groups and examine the determinants of high quality outcomes. Our findings support the theoretical claim that dyads reach more integrative agreements than groups on both economic and social psychological dimensions of an integrative agreement. Theory predicts that a primary reason for groups achieving lower outcomes than dyads is that the increase in information load leads to less judgement accuracy.

Our secondary interest was to investigate how increases in people complexity (dyads to groups) affect the determinants of integrative agreements. Overall, our findings support the predictions that differences exist between dyadic and group negotiation. Specifically, groups had less judgement accuracy (more fixed pie error) and reported less problem solving than dyads. However, by examining this data closer some interesting findings emerged.

In the negotiation theory, both decreases in judgement accuracy and problem solving are predicted in groups. Decreases in judgement accuracy and problems solving were postulated to cause the lower outcomes in groups. These postulations were not fully supported. The relationships appear more complex than presented in the literature. Judgement accuracy did not cause lower outcomes for dyads or groups, and although problem solving was less prevalent in groups it led to higher economic and social psychological outcomes for groups. For dyads problem solving only led to higher social psychological outcomes. There were significant differences between the determinants of integrative agreements for dyads and groups. Problem solving was found to be positively related to high economic outcomes for groups but *negatively* related to economic outcomes for dyads (statistically significant difference). In addition, we found that the 6 intermediate variables explained more of the variance in the integrative agreements for dyads than for groups.

From this study, our main conclusions are that we have empirical support that dyads achieve more integrative agreements than groups, and that the determinants of integrative agreements (intermediate variables) may vary in importance for dyads and groups. From our results it appears that caution must be used in directly transferring research on dyadic negotiations to groups.

In the next section we will present the findings in more detail and evaluate their validity.

9.2 Overview of the findings

In this section the significant results will be presented first. In section (9.2.2) the non-significant findings will be reviewed and possible explanations for the lack of support for our hypotheses will be discussed. In the third part of this section we will introduce general issues regarding the validity of our findings.

9.2.1 Significant results

Our overall conclusions are based on the significant findings briefly described in this section. Reviewing our conceptual model, we note that our primary interest in this study was to determine whether there was empirical support that dyads perform better than groups in a negotiation. Although theoretically this was expected, there had been no empirical investigation directly comparing negotiating dyads and groups.

Research question 1 addressed the differences in outcomes between dyads and groups. Consistent with our predictions dyads achieved higher economic outcomes ($t=2.01$, $df=56$ $p<.05$, 1-tail), defined by the distance from the Nash solution, and obtained higher social psychological benefit, ($t=2.727$, $df=55$ $p<.0.1$, 1-tail), defined by the degree of benefit in the negotiating unit.

The aim of research question 2 was to discover whether the determinants of integrative agreements were similar for dyads and groups. The results revealed that there were significant differences between dyads and groups (*Wilks Lambda* (.694) and Pillai's trace (.306), both at $p=.005$). Specific predictions were also made for 3 of the intermediate variables: judgement accuracy, priority information sharing, and problem solving. We found, as predicted from the literature, that groups had more fixed pie bias than dyads ($F_{1, 55} = 52.76$, $p<.001$ 1-tail). Partial support was found for the problem solving variable, with dyads reporting more problem solving than groups ($F_{1, 56} = 2.96$, $p<.10$ 1-tail). Significance was found for research question 2, with 2 of our 3 hypotheses supported..

The third research question sought to discover whether the role of the intermediate variables had the same effect on integrative agreements in groups and dyads. This research question

was more explorative in nature than the other research questions. For dyads, the consideration of issues (agenda) ($t=3.04$, $p<.006$), and the degree of organisation ($t=2.530$, $p<.021$) contributed significantly to high economic outcomes. Problem solving in dyads however, had a negative impact on economic outcomes ($t=-2.061$, $p<.054$). It appears that in dyads the procedural structure is a good predictor of economic outcomes. However, for dyads different intermediate variables were important when examining social psychological benefit. The only variable that contributed significantly and positively to high social psychological benefit was problem solving ($t=2.623$, $p<.018$).

For groups, problem solving was the only intermediate variable that was significant both for the economic ($t=2.382$, $p<.026$), and social psychological outcomes ($t=4.547$, $p<.000$). To test for significant differences between dyads and groups a t -test for the difference between beta coefficients was run. The contribution of the problem solving variable to economic outcomes was significantly different between the dyadic and group conditions ($t=3.029$, $p<.01$).

All 4 multiple regression models for dyads and groups were significant. The 6 intermediate variables included in this study accounted for a large proportion of the outcome variables. The regression model for the dyadic economic outcomes accounted for a higher proportion of variance than the regression equation for the groups.

In this section we have highlighted our significant findings. Overall, our 3 research questions have shown that dyads perform better than groups on a negotiation task, that differences exist between the intermediate variables in dyads and groups, and finally we have indications from our third research question that mechanisms that lead to integrative outcomes differ between dyads and groups.

In the next section we will briefly discuss what we expected to find, but did not.

9.2.2 Non-significant results

The most important and perhaps surprising non-findings in our study are related to the role of judgement accuracy and information sharing in a negotiation. In Chapter 2, behavioural decision theory was the theoretical base of our investigation. We conceptualised increasing the number of parties as an increase in objective task complexity. This specific type of

objective task complexity we labelled people complexity. The decision theory clearly states, based on extensive empirical research, that as objective complexity increases, simplifying strategies will be used and these can lead to sub-optimal decision outcomes. One simplifying strategy often found in negotiations is the fixed pie bias and this bias has been linked to lower integrative outcomes. Information sharing is also critical in behavioural decision and negotiation theory and Information exchange has been shown to be related to judgement accuracy and integrative agreements. It has been demonstrated in previous research that both judgement accuracy and information exchange influence outcomes in negotiations.

The results of our study did not support the causal role of judgement accuracy and priority information exchange. In addition, we found no support that increases in issue complexity affect the outcomes in a negotiation.

Judgement accuracy as measured by the presence of fixed pie bias, although higher in groups, was not causally related to economic or social psychological outcomes. Judgement accuracy was significantly correlated to outcomes, but after running the sub-sample multiple regressions, judgement accuracy was not found to contribute to economic or social psychological outcomes for dyads or groups. The other research on judgement accuracy has generally examined the correlations between judgement accuracy and high economic outcomes (c.f. Thompson, 1991). In Arunachalam and Dilla's (1995)'s study, judgement accuracy was found to be significantly related to group negotiation outcomes. However, their manipulation of communication channels had effects on outcomes not mediated by judgement error. This implies that other mechanisms are working in the group negotiation besides judgement accuracy alone. Although their experiment showed that their manipulations improved negotiation outcomes by reducing negotiator judgement error, other mechanisms were also at work affecting outcomes.

Possible explanations for our lack of findings with judgement accuracy could be related to measurement however, these issues will be addressed in the next section. First it should be noted that our results are consistent with the other research that has shown a correlation between judgement accuracy and economic outcomes (Kimmel et al., 1980; Thompson and Hastie, 1990a; and Thompson, 1991). Our lack of findings linking judgement accuracy causally to integrative outcomes might be related to the fact that other factors in the negotiation process are more important than judgement accuracy in contributing to integrative

outcomes. The difference between our results and the results of Arunachalam and Dilla's (1995) could be explained by the intermediate variables we included in our model. One could postulate that the relationship of judgement accuracy to outcomes is caused by other variables such as procedural structure or problem solving. Structure or approach might be more important in negotiations than accuracy alone. The negotiation literature emphasises the importance of other components in a negotiation such as relational, motivational and structural elements (cf. Greenhalgh and Chapman, 1995; Pruitt and Carnevale, 1982; and Weingart et al., 1993). Arunachalam and Dilla (1995) only included judgement accuracy variables and not other intermediate variables. Perhaps our non-findings illustrate that the role of accuracy is dependent on other factors in a negotiation.

From the decision research, individual judgement accuracy is linked to individual outcomes. The level of analysis we used in our study might explain our lack of causal findings. However, biases found at the individual level have been found at the group level (Argote et al. 1986; and Bazerman et al. 1984), and in the negotiation literature judgement accuracy and outcomes have been measured at this level.

In this study we found no support for the role of sharing priority information. This non-finding can be attributed to our measurement, and to the equivocal role information exchange has played in the negotiation theory. Measurement issues will be introduced in the next section. From the negotiation theory, we know that information exchange can be important in a negotiation but its impact varies depending on how the information is understood and used (Pinkley et al, 1995; and Thompson, 1991). Due to our measurement instruments, we were unable to obtain a detailed understanding of the information exchange that took place in the negotiation, and we conclude this to be the reason for our lack of findings.

The role of increases in issue complexity did not affect the economic or social psychological outcomes in dyads or groups. Increases in objective task complexity, determined by the number of issues, did not lead to lower outcomes. A possible explanation for this non-finding is that the negotiation was already sufficiently complex in terms of issues so that the addition of more issues did not have the intended effect. The negotiation simulation, although containing few issues in the low issue complexity condition, had more information than other similar negotiation tasks. The simulations used in this study were more realistic and required more information regarding the issues and alternatives. This additional information might

have made the low issue complexity condition too complex. This is one possible explanation for the lack of significance found.

Another explanation, consistent with our findings, is that judgement accuracy did not affect negotiation outcomes because other mechanisms were critical for outcomes. Both people and issue complexity are different dimensions of objective task complexity. Increases in objective task complexity, denoted by any increase in information load of the task, were postulated to affect decision strategies, which in turn would affect outcomes. As stated above the information load might have been sufficiently high so further increases did not change decision strategies.

Increases in objective task complexity, due to increases in the number of parties did cause more fixed pie bias, however lower outcomes could not be attributed to this lack of judgement accuracy. It appears that people complexity does not merely increase information load and change decision strategies but instead it influences outcomes in other ways.

Finally, we did not find support for the tentative hypothesis that procedural structure is more important for groups than for dyads. Results revealed the opposite conclusion for measures on the economic outcome (i.e. procedure was important to dyads for high outcomes). For the social psychological outcome these variables were not significant for groups or dyads. One possible explanation for this finding is that it is easier in dyads than in groups to take advantage of the correct procedural structure. Groups might find simultaneous consideration of issues too difficult to properly implement. Although Weingart et al. (1993) have shown that groups that use simultaneous consideration of issues do better than groups who use sequential consideration of issues, this could be explained by their manipulations and measures. Also they found that sequential groups could do well if there was trust and reciprocation. They directly manipulated agendas rather than allowed them to emerge, which could have cued groups about the integrative potential of the negotiation. Finally, the manipulation used by Weingart et al. (1993) for sequential consideration of issues was highly artificial (groups could not discuss more than one issue at a time). Our study, on the other hand, had degree of sequential and simultaneous consideration of issues rather than a categorical manipulation.

In the next section general issues of validity will be presented. These evaluations will place our findings and non-findings in perspective.

9.2.3 Issues of validity

The validity of our conclusions will be assessed by reviewing some of the measurement issues and potential statistical problems with our findings.

Potential measurement problems are related to our simulation, and to our questionnaire. Our simulations were quite detailed and could have provided too much information for the subjects, which could account for the lack of findings with respect to increases in issue complexity. The problem with added realism in our simulations is that participants might make additional judgements regarding the validity of the arguments given in the simulation.

Others potential problems are related to the use of simulations in general. These include:

1. The assignment of preferences, and assumptions of linear utilities (Northcraft et al. 1995).
2. Only investigating logrolling tasks for understanding integrative outcomes in negotiations.
3. Excluding the rôle of relationships in negotiations (Greenhalgh and Chapman, 1995).
4. Assuming that what takes place at the negotiation table is the most important aspect of negotiations (Lewicki et al., 1992).

As for our questionnaire, we will first discuss the measurement of the intermediate variables followed by the social psychological outcome variable. Ideally, observations would have been made to measure our intermediate variables. However, as stated previously, a questionnaire was used based on methodological and practical reasons. We will present our intermediate variables in the following order: judgement accuracy, information sharing, problem solving, agenda, degree of organisation, and trading issues. Finally, we will discuss our measure and conceptualisation of the social psychological outcome variable.

Judgement accuracy was indicated by the degree of fixed pie bias in the negotiating unit. The measure we used was similar to other measures, and correlated with the predicted outcome measures. However, our measure required less detail from the participants and perhaps did not differentiate between different levels of accuracy while other studies have used a more detailed measure. Consequently, a more precise measure of the negotiating units' judgement

accuracy would have given us a more powerful test of our hypotheses. However, due to the complexity of the negotiation task we believed the chosen measure would give us a good indication of the amount of bias found in the negotiating units. Although not as sensitive as other measures, our measure of judgement accuracy was consistent with several of the theoretical predictions, and did give a base indication of accuracy.

The second intermediate variable is exchange of priority information. The operationalisation of this variable excluded reporting the overall amount of information and the percentage of priority information exchanged. Also, the measure involved asking individuals if they had told anybody about their priorities, and not whether the other members had actually understood or listened to this information. We believe that the operationalisation of this variable was weak, and can in part account for our lack of findings. The validity of the priority information exchange variable appears to be questionable, and non-findings for this variable are most likely linked to our measurement, and not the role of this variable in negotiations.

The third intermediate variable measured in the questionnaire, was problem solving. The problem solving measure was a single item measure involving subjective interpretations about the group behaviour in the process. All group members reported on this behaviour. We therefore have multiple measures for the group level variable. Subjective interpretations of problem solving could bring into question whether individual members were reporting on the same behaviour. However, intragroup correlations in both dyadic and group sub-samples showed that there was intragroup agreement on the reporting of this process variable. Statistical examination of this variable revealed that there were greater differences between groups than within groups. The measure of problem solving is reliable. The validity of the measure can be questioned.. However, the fact there was agreement in the group about this behaviour, and our question is similar to the other measures of this construct (Pruitt and Lewis, 1975), we believe that the measure is valid.

The variables for procedural structure are considered sufficiently reliable and valid. By examining each indicator (question), the reliability of the measure was assessed. Variance within negotiating units was smaller than the variance between negotiating units on each indicator, suggesting that the group level measure of these variables is reliable. The use of aggregated data (which provides multiple measures of the behaviour that occurred in the

negotiating units), and the high face validity of the measures, indicate our construct has validity. The use of indexes in general, increases the validity and reliability of a measure.

The final intermediate variable measured was trading issues. Recall that we included this variable to check how the requirement of the task might influence outcomes. The negotiation task required trading of priority issues so that integrative agreements will be achieved. Our measure examined whether the trading behaviour took place, but not whether priority issues were traded. This measure was assessed for reliability by examining intragroup correlation and was found to be reliable. The measure also had multiple respondents and high face validity. However, this question did not measure the amount of trading that took place nor whether priority issues were traded.

The last variable examined for reliability and validity is the social psychological outcome variable. This variable showed high reliability and high face validity. The high alpha coefficients at the group level denote the reliability of the measure ($r = .8116$). However, the method of aggregation and operationalisation of social psychological benefit in the negotiating unit might be questioned. Since few measures have sought to understand the social psychological dimension of integrative agreements, we view this measure as improving with repeated testing and development. In the current study, this variable showed the predicted relationship with the economic outcome variable. Overall, this variable is still at the formation stage and issues of aggregation and measurement are not settled. In the present study, however, we are satisfied with the reliability of this measure, its high face validity and its fit with the other variables.

Finally, we need to discuss the robustness and validity of our data analysis and results. First, it should be noted that our small samples affect our confidence in our conclusions drawn for research question 3. Since we had few degrees of freedom our data is restricted and hence our predictions may be less generalisable. Few degrees of freedom suggests that the resulting prediction may be less generalisable, as few observations were not incorporated into the prediction. However, our use of the multiple regression in an experiment with high reported significance levels and explained variance, gives us confidence that our findings have determined: (a) which variables are important for an integrative agreement, and (b) the contribution of these variables to the outcomes. We should, however, use caution in interpreting the degree of significance and the amount of variation explained.

The generalisability of our study as mentioned previously is focused on theory and not on effects. We are most interested in relationships between the variables that *can* exist. Our statistical analysis has been able to isolate the primary variables that affect outcomes in dyadic and group negotiations.

9.3 Findings in light of the current research

Our findings give empirical support to negotiation theory which states that groups will achieve less integrative agreements than dyads (Bazerman, et al., 1988; and Kramer, 1991). Our study also reveals that the application of research on dyads to group negotiation should be done with caution.

The proposed determinants of integrative agreements also appear to differ between dyads and groups in the expected direction: decreases in the use of problem solving in groups (Bazerman et al., 1988; and Kramer, 1991) and increases in the fixed pie bias (Kramer, 1991). However our findings are not consistent with Arunachalam and Dilla, (1995) where causal links between judgement accuracy and high outcomes were established. Although many studies have postulated the causal link between judgement accuracy and high economic outcomes, few have investigated causal relationships (Arunachalam and Dilla, 1995). Our results are consistent with other studies in finding significant correlations between judgement accuracy and outcomes (Carnevale and Isen, 1986, Kimmel et al., 1980 and Thompson, 1991). In light of the theory and contradictory empirical findings we suggest that more research investigate in detail the causal link between judgement accuracy and integrative agreements, as well as, the use of multiple and varied measures of judgement accuracy. Our findings suggest that the causal relationship between judgement accuracy and integrative agreements is not as straight forward as previously thought.

As mentioned previously, priority information sharing was not shown to be related to outcomes. Our interpretation is that our measure of priority information exchange was not detailed enough and therefore findings did not match the predictions of the theories. We will not comment further on these non-findings and their relation to theory, since we believe this to be caused by weaknesses in measurement.

The finding that problem solving led to lower economic outcomes for dyads and higher economic outcomes for groups is an unusual finding. The negotiation literature claims a problem solving orientation is positive for integrative agreements, and empirical evidence supports that a problem solving orientation in dyads leads to integrative agreements (Pruitt and Carnevale, 1982 and Walton and McKersie, 1965). Our contradictory findings could arise from the fact that previous studies have manipulated the problem solving orientation whereas we used self reports on problem solving behaviour. Our measure is also at the group level, as opposed to the individual level, and is used to describe the group negotiation process.

In the group condition, full support for the positive relationship between problem solving and outcomes was maintained (both on the economic and social psychological dimension measures). This is consistent with current negotiation theory's predictions of the positive effects of problem solving. For dyads, the positive relationship between problem solving and negotiation outcomes was only true for the social psychological measure. For the economic outcome measure, problem solving had a negative effect on outcomes. Implications for negotiation theory are that different effects of problems solving at the group level require further investigation and multiple measures. What we can safely deduce from these findings is that different mechanisms appear to be working in dyads and groups. Overall, it is necessary to remember that our third research question is more exploratory. From the present study, we can conclude that problem solving at the group level has different effects for dyads and groups on economic dimensions of an integrative agreement.

Our next intermediate variable, procedural structure, has been manipulated in previous studies whereas in our study we allowed procedural structure to emerge. Our findings show that organisation of the negotiation is not more important for groups than dyads. This contradicts predictions made from the theory. It is difficult to assess why structure was found to be important for dyads, but not groups, however we postulated that perhaps it could be more difficult for groups to reap the benefits of good procedural structure (simultaneous agendas and time for organising). Further research is required, but these findings indicate that simply instructing a group to consider issues simultaneously or spend time organising, is sufficient to guarantee good outcomes.

Recall that we included the trading issue variable to check how the requirement of the task might influence outcomes. Merely trading issues did not lead to a more integrative agreement

however trading issues was significantly correlated with judgement accuracy in groups and agendas in dyads (see table 20). These correlations indicate that trading issues might have different effects for dyads and groups. The role of this variable is unclear. In the multiple regression, trading issues did not account for higher economic outcomes for dyads or groups. The important finding with this variable, is that even when negotiating units trade issues, there is no guarantee that they will achieve integrative agreements.

In summary, our research findings are consistent with much of the negotiation theory regarding the general differences between dyads and groups. Our findings, however, are not consistent the decision theory and indicate that judgement accuracy might not be as important for achieving integrative agreements as other mechanisms. In addition to information processing perspectives, negotiation researchers have suggested the importance of interpersonal and emotional dimensions of group negotiations (cf. Kramer, 1991). It appears that these other dimensions could be essential for understanding the differences between dyadic and group negotiations.

The findings from this study add to the current theory by specifying the differences and similarities between dyadic and group negotiations. We must remember that research question 3 was more explorative than the other research questions, and that further research is required to refine our understanding of the mechanisms that lead to integrative agreements in dyads and groups.

9.4 Concluding remarks on results

In this chapter we presented a discussion of the results from our study. Significant findings, and non-findings, were examined. The validity and reliability of our measures, and our study were also evaluated. Our results support the theoretical proposition that groups and dyads differ both in terms of outcomes and the mechanisms for achieving integrative agreements. In the next chapter we present the general strengths and limitations with our study, as well as, what are study implies for managers.

CHAPTER 10

Conclusion

Our findings have illustrated that groups achieve less integrative agreements than dyads. The findings also indicate that the mechanisms for achieving integrative agreements in dyads and groups differ. Procedural structure predicts high economic outcomes for dyads, whereas problem solving contributes to both economic and social psychological outcomes in groups. Problem solving is significantly different for dyads and groups. In dyads problems solving leads to lower economic outcomes although higher social psychological outcomes.

In this chapter we present the contributions of our study and then discuss the limitations. We conclude with implication for managers and comments on future research

10.1 Contributions and Strengths

The strengths of this study are related to the task designed to investigate our research question, our conceptualisation of an integrative agreement and our empirical findings that groups and dyads differ in terms of the variables found in their processes and outcomes.

The simulations developed for this research allowed direct comparisons to be made between dyads and groups, and added more realism to the negotiation task. Since previous research has not designed tasks that are directly comparable we consider this a contribution.

Our conceptualisation of an integrative agreement as including both economic and social psychological dimensions extends our understanding of what an integrative agreement is, and provides a more accurate operationalisation of the construct. Also, our economic measure of outcomes, the Nash solution, allowed us to incorporate the distributional dimension into the outcome score. Based on the definition of an integrative agreement this outcome measure more accurately reflects joint benefit and grounds joint benefit in economic theory.

Finally, our empirical findings contribute to an understanding of the similarities and differences between dyadic and group negotiations.

10.2 Limitations

The main limitations of the study are connected to measurement issues, sample size, and research design and setting. Since we have already discussed the measurement and sample size issues in section (9.2.3) we will focus on the setting.

One could argue that the laboratory experiment is an inappropriate research design and setting for understanding the complexity of negotiation. Although this is a potential weakness it was deemed important to determine if groups did have lower outcomes, than dyads and if the processes and determinants of integrative agreements differed. In order to examine these causal questions an experimental design was necessary.

It should be reiterated that research question 3 is tentative, and that the findings based on our measures, require further specification, improvement and testing. We also believe that observations rather than questionnaires should be used to gain a better understanding of some of the process variables.

10.3 Implications of the study for professional practice

Managers can benefit from a better understanding of group activities and outcomes in organisations. We have argued throughout this dissertation that many group tasks can be characterised as a negotiation. Our study points managers towards negotiation theory to understand group processes and outcomes, and negotiation theory can provide useful interventions to improve group outcomes. In order to properly use the prescriptions from the negotiation theory, we have argued that it is necessary to understand the similarities and differences between dyadic and group negotiation.

Our study shows that caution should be used when applying research findings based on dyads to groups. Managers should be aware that groups do not reach as integrative agreements as dyads. From our research we believe that encouraging groups to approach the task as a problem to be solved can lead to higher quality outcomes in groups.

Integrative agreements are important in organisations and an understanding of these outcomes and how groups can achieve them is necessary. Our study focuses on illuminating these issues, however, our findings are preliminary and require further research.

10.4 Future research

More research is needed on group negotiations, and the similarities and differences between dyads and groups of varying sizes. We need to explore in more detail which mechanisms lead to integrative agreements in dyads and groups. Future research should also focus on improved economic measures of integrative agreements, and continue to develop the social psychological measure.

This study has attempted to isolate some primary differences between dyadic and group negotiation however, it is only the first step. More research is needed to understand judgement accuracy and relational issues in negotiations, and how the relative importance of these dimensions may differ between groups and dyads. Research also needs to focus on causal rather than merely correlational relationships.

REFERENCES

- Argote, L., Devadas, R., and Melone, N. (1990). The base rate fallacy: contrasting processes and outcomes of group and individual judgment. *Organizational Behavior and Human Decision Processes*, 46: 296 - 310.
- Argote, L.D., Seabright Mark A., and Dyer, Linda (1986). Individual versus group use of base-rate and individuating information. *Organizational Behavior and Human Decision Processes*, 38: 65-75.
- Arunachalam, V., and Dilla, W. (1995). Judgement accuracy and outcomes in negotiation: A causal modeling analysis of decision-aiding effects. *Organizational Behavior and Human Decision Processes*, 61, 3: 289-304.
- Asch, S.E. (1951). Effects of group pressure upon the modification and distortion of judgements. In *Groups, Leadership, and Medn.* Ed. H. Guetzkow. Pittsburgh, PA.: Carneige Press (quoted in Bazerman et al., 1988).
- Bazerman, M.H. (1986). *Judgment In Decision Making*. New York: John Wiley and Sons.
- Bazerman, M.H. (1993). Fairness and Social Comparison. In J.K. Murnighan (Ed.) *Social Psychology in organizations: Advances in Theory and research*: 184-203, Englewood Cliffs; NJ: Prentice Hall.
- Bazerman, M.H. and Carroll, John S. (1987). Negotiator Cognition. In L.L. Cummings & B.M. Staws (Eds.) *Research on Organizational Behavior*. Greenwich, CT: JAI Press: 247-288.
- Bazerman, M.H., Guiliano, T. And Appleman, A. (1984). Escalation of Commitment in Individual and group decision making. *Organizational Behavior and Human Performance*. 33:141-152.
- Bazerman, M.H., Magliozzi, Thomas, and Neale, Margaret A. (1985). Integrative bargaining in a competitive market. *Organizational Behavior and Human Decision Processes*, 35: 294 – 313.
- Bazerman, M.H, Mannix, Elizabeth A., and Thompson, Leigh L. (1988). Groups as mixed motive negotiations. *Advances In Group Processes*, 5: 195-216.
- Bazerman, M.H. and Neale, M.A. (1982). Improving negotiator effectiveness: The role of selection and training. *Journal of Applied Psychology*, 67:543-548.
- Bazerman, M.H. and Neale, M.A. (1992) *Negotiating rationally*. New York: Free Press.
- Beach, L.R. and Mitchell, Terrence, R. (1978). A contingency model for the selection of decision strategies. *Academy of Management Review*, 2: 439-449.
- Bettenhausen, K. (1991) Five years if group research: What we have learned and what needs to be addressed. *Journal of management*, vol.7, 2: 345-381.

- Biggs, S.F., Bedard, J.C., Gaber, B.G., and Linsmeier, T.J. (1985). The effects of task size and similarity on the decision behavior of bank load officers. *Management Science*, 31: 970-987.
- Bollen, Kenneth, and Lennox, R. (1991). Conventional wisdom on measurement: A structural equation perspective. *Psychological Bulletin*, 110, 2: 305-314.
- Bovens, Luc. (1987). On arguments form self-interest for the Nash solution and Kalia egalitarian solution to the bargaining problem. *Theory and decision*, 23: 231-260.
- Brehmer, B. (1976). Social judgment theory and the analysis of interpersonal conflict. *Psychological Bulletin*, 83 (6):985-1003.
- Brett, J.M. (1991). In theory: Negotiating group decisions. *Negotiation Journal*, July: 291-310.
- Calder, B., Phillips, L., and Tybout, A. (1981). Designing research for application. *Journal of Consumer Resesearch*, vol. 8: 197-206.
- Campbell, D.J. (1988). Task complexity: A review and analysis. *Academy of Management Review*, 13 (1): 40-52.
- Campbell, D.T. (1969). Reforms as experiments. *American Psychologist*, 24:409-429 (quoted in Judd et al. 1991).
- Carnevale, P. and Isen, A.M. (1986). The influence of positive affect and visual access on the discovery of integrative solutions in bilateral negotiation. *Organizational Behavior and Human Decision Processes*, 37: 1-13.
- Carnevale, P.J.D and Lawler, E.J. (1987). Time pressure and the development of integrative agreements in bilateral negotiations. *Journal of Conflict Resolution*, 30 (4): 636-659.
- Carnevale, Peter, and Pruitt, Dean G. (1992). Negotiation and Mediation. *American Review of Psychology*, 43:531-82.
- Carroll, J.S., Bazerman, M.H. and Maury, Robin (1988). Negotiator cognitions: A descriptive approach to negotiator's understanding their opponents. *Organizational Behavior and Human Decision Processes*, 41: 353-370.
- Carroll, J.S. and Payne, John, W. (1991). An information processing approach to two party negotiations. In M.H. Bazerman, R.J Lewicki, and B.H. Sheppard (Eds.) *Research on Negotiation in Organizations*, 3: 3-34. Greenwich, CT: JAI.
- Churchill, G.A. *MarketingResearch: Methodological foundations*. 4thed. Chicago: The Dryden Press.
- Eliasberg, J.LaTour, S.A., Rangaswamy, A. and Stern, L.W. (1986). Assessing the predictive accuracy of two utility based theories in a marketing channel negotiator context. *Journal of Marketing Research*, 21, 39-53.

- Fisher, R., Ury, W., and Patton, B. (1991). *Getting to Yes: Negotiating agreement without giving in 2nd edition*. Boston: Houghton Mifflin.
- Fiske, Susan, T., and Taylor, Shelley E., (1991). *Social Cognition, 2nd edition*. New York: McGraw-Hill, Inc.
- Florin, P., Giamartino, G., Kenny, D. and Wandersman, A. (1990). Levels of analysis and effects: Clarifying group influence and climate by separating individual and group effects. *Journal of Applied Psychology*, 20, 11:881-900.
- Follett, Mary Parker (1925). Constructive conflict. In P. Graham (Ed.). *Mary Parker Follett-Prophet of Management: A Celebration of Writings from the 1920's*. Boston, Massachusetts: Harvard Business School Press (1995). This paper was first presented before a Bureau of Personnel Administration conference group in 1925.
- Greenhalgh, L. and Chapman, D. (1995). Joint decision making: The inseparability of relationships and negotiation. In R.M. Kramer & D. M. Messick (Eds.), *Negotiation as a Social Process*. London; Sage Publications: 166-185.
- Greenhalgh, L. and Neslin, S.A. (1983). Determining outcomes of negotiations. In M.H. Bazerman, and R.J Lewicki (eds.) *Negotiating in Organisations*, Sage Publications:114-134.
- Greenhalgh, L., Neslin, S. and Gilkey, R.W. (1985) The effects of negotiator preferences, situational power and personality on outcomes of business negotiations. *Academy of management of Journal*, 28. 9-33.
- Haire, Joseph F. Jr., Anderson, Rolph E., Tatham, Ronald L., and Black, W. (1992). *Multivariate Data Analysis* , 3rd edition. New York: MacMillan Publishing
- Hardy, Melissa (1993). *Regression with dummy variables*. Newbury Park: Sage.
- Harris, M.M.(1990). Methodological issues and statistical techniques in conflict management research: An update. *The International Journal of Conflict Management*. Vol.1:3:293-307
- Hogarth, Robin. (1987). *Judgement and Choice, second edition*. Chichester: John Wiley and Sons.
- Huber, V.L. and Neale, M.A. (1986). Effects of cognitive heuristics and goals on negotiator performance and subsequent goal setting. *Organizational Behavior and Human Decision Processes*, 38: 342-365.
- Iversen, G. and Norpoth, H. (1987). *Analysis of Variance*, 2ed. Newbury Park: Sage.
- Judd, C.M., Smith, E.R. and Kidder, L.H. (1991) *Research Methods in Social Relations*, 6th ed. Fort Worth: Holt, Rhinehart and Winston, Inc.
- Kelley, H.H. (1966). A classroom study of the dilemmas in interpersonal negotiations. In K. Archibald (Ed), *Strategic interaction and Conflict*. Berkeley, Calif.: Institute of International Studies, University of California, 1966.

- Kelly, J.R. and McGrath, J.E. (1985). Effects of time limits and task types on task performance and interaction of four-person groups. *Journal of Personality and Social Psychology*, vol. 49:2: 395-407.
- Kenny, D. and La Voie, L. (1985). Separating individual and group effects. *Journal of Personality and Social Psychology*, vol.48, 239-248.
- Kim, Jae-on and Mueller, C.W. (1986). *Factor Analysis: Statistical methods and practical issues*. Beverly Hills: Sage Publications.
- Kimmel, M.J., Pruitt, D. Magenau, J., Konar-Goldband, E., and Carnevale, P. (1980). Effects of trust, aspiration, and gender on negotiation tactics. *Journal of personality and social psychology*, vol. 38, 1: 9-22.
- Kramer, R.M. (1991). The more the merrier: Social psychological aspects of multiparty negotiations in organisations. In M.H. Bazerman, R.J Lewicki, and B.H. Sheppard (Eds.) *Research on Negotiation in Organisations*, 3: (307-332). Greenwich, CT: JAI.
- Lensberg, Terje (1997, April). *Discussions relating to the Nash Solution*. Bergen, Norway
- Levine, J. and Moreland, R. (1990). Progress in small group research. *Annual Review of Psychology*, 41:585-634.
- Lewicki, R., Weiss, S., and Lewin, D. (1992). Models of conflict, negotiation and third party intervention: A review and synthesis. *Journal of Organisation Behavior*, vol.13: 209-252.
- Lind, E.A. and Tyler, T.R. (1988). *The social psychology of procedural justice*. New York: Plenum.
- Lowenstein, G, Thompson, L., and Bazerman, M.H. (1989). Social utility and decision making in interpersonal contexts. *Journal of Personality and Social Psychology*.
- Luce, D.R., and Raiffa, H. (1957). *Games and Decisions*. New York: John Wiley.
- Lussier, D.A., and Olshavsky, Richard W. (1979) Task complexity and contingent processing in brand choice. *Journal of Consumer Research*, 6:154-165.
- Mannix, E. (1993). Organisations as resource dilemmas: The effects of power balance on coalition formation in small groups. *Organizational Behavior and Human Decision Processes*, 55: 1-22.
- Mannix, E., Thompson, L., and Bazerman, M.H. (1989). Negotiation in small groups. *Journal of Applied Psychology*, 74(3): 508-517.
- Mannix, E. and White, S.B. (1992). The impact of distributive uncertainty on coalition formation in organisations. *Organizational Behavior and Human Decision Processes*, 51: 198-219.
- Midgaard, K and Underdal, A (1977). Multiparty conferences. In D. Druckman (ed). *Negotiations: Social psychological perspectives*. LA: Sage: 329-345.

- Miller, George A. (1994). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, 101(2): 343-352.
- Mumpower, J.L. (1989). The cognitive characteristics of negotiators and the structure of negotiations. Working paper, Center for Policy Research, State University of New York, Albany.
- Murnighan, J. K. (1994). Game theory and organizational behavior. In L.L. Cummings & B.M. Staws (Eds.) *Research on Organizational Behavior*. Greenwich, CT: JAI Press.
- Murnighan, J. K. (1978). Models of coalition behavior: Game theoretic, social psychological, and political perspectives. *Psychological Bulletin*. vol.85, No.5: 1130-1153.
- Murnighan, J. K. (1985). Coalitions in decision making groups: Organizational Analogs. *Organizational Behavior and Human Decision Processes*, 35: 1-26.
- Nachmias, Chavas and Nachmias, David (1981). *Research Methods in the Social Sciences: Alternate ed. without statistics*. London: Edward Arnold.
- Nash, J.F. (1950) The bargaining problem, *Econometrica*, 18:155-162
- Neale, M.A. (1984). The effect of negotiation and arbitration cost salience on bargainer behavior: The role of arbitrator and constituency in negotiator judgment. *Organizational Behavior and Human Performance*, 34: 97-111.
- Neale, M.A. and Bazerman, M.H. (1985). When will externally set aspiration levels improve negotiator performance? A look at integrative behavior in a competitive market. *Journal of Occupational Behavior*, 6: 19-32.*
- Neale, M.A. and Bazerman, M.H. (1992). Negotiator cognition and rationality: A behavioral decision theory perspective. *Organizational Behavior and Human Decision Processes*, 51: 157-175.
- Neale, M.A., Huber, V.L., and Northcraft, Gregory. (1987). The framing of negotiations: Contextual versus task effects. *Organizational Behavior and Human Decision Processes*, 39: 228-241.
- Neale, M.A. and Northcraft, Gregory B.(1986). Experts, amateurs, and refrigerators: Comparing expert and amateur negotiators in a novel task. *Organizational Behavior and Human Decision Processes*, 38: 305-317.
- Neale, M.A., and Northcraft, Gregory B. (1990). Experience, expertise, and decision bias in negotiations: The role of strategic conceptualization. In M.H. Bazerman, R.J Lewicki, and B.H. Sheppard (Eds.) *Research on Negotiation in Organisations*, (55-75). Greenwich, CT:JAI.

Neale, M.A., and Northcraft, Gregory B. (1991). Behavioral decision theory: A framework for conceptualizing dyadic bargaining. In L.L. Cummings & B.M. Staws (Eds.), *Research on Organizational Behavior*. Greenwich, CT:JAI Press.

Nicholson, Walter (1989). *Microeconomic theory: Basic principles and extensions* fourth edition. Chicago: Dryden Press.

Northcraft, Gregory B. Brodt, S.E. and Neale, M.A. (1995). Negotiating with nonlinear subjective utilities: Why some concessions are more equal than others. *Organizational Behavior and Human Decision Processes*, 63: 298-310.

Olshavsky, R. W. (1979). Task complexity and contingent processing in decision making: A replication and extension. *Organizational Behavior and Human Performance*, 24: 300-316.

Ostroff, Cheri, (1993). Comparing correlations based on individual-level and aggregated data. *Journal of Applied Psychology*, vol. 78, no.4, 569- 582.

Parks, Craig D. and Cowlin, Rebecca (1995). Group discussion as affected by the number of alternatives and by a time limit. *Organizational Behavior and Human Decision Processes*, 62 (3): 267 - 275.

Payne, John W. (1976). Heuristic search processes in decision making. *ACR* 3: 321-327.

Payne, John W. (1976). Task complexity and contingent processing in decision making: An information search and protocol analysis. *Organizational Behavior and Human Performance*, 16: 300-316.

Payne, J.W., Bettman, James R., and Johnson, Eric J. (1993). *The Adaptive Decision Maker*. New York: Cambridge University Press.

Pinkley, R., Griffith, T. And Northcraft, G. (1995). 'Fixed pie' a la mode: Information availability, information processing, and negotiation of suboptimal agreements. *Organizational Behavior and Human Decision Processes*, 62,1: 101-112.

Pruitt, D.G. (1983). Achieving integrative agreements. In M.H. Bazerman, and R.J Lewicki (eds.) *Negotiating in Organisations*, (35-50). Sage Publications.

Pruitt, D.G. (1983b). Strategic choice in negotiation. *American Behavioral Scientist*, vol. 27 No.2., November/December:167-194.

Pruitt, D.G. and Carnevale, P.J. (1982). The development of integrative agreements. In *Co-operative and Helping Behavior: Theories and Research*. (Eds.) Valerian J. Derlega and Janusz Grzelak. New York: Academic Press.

Pruitt, D.G. and Drews, J.L. (1969). The effect of time pressure, time elapsed, and the opponent's concession rate on behavior in Negotiation. *Journal of Experimental Social Psychology*, 5: 43-60.

Pruitt, Dean G. and Lewis, S. (1975). Development of integrative solutions in bilateral negotiations. *Journal of Personality and Social Psychology*. 5:43-60

- Pruitt, Dean G. and Lewis, S. (1977). The psychology of integrative bargaining. In D. Druckman (Ed.), *Negotiations: A social psychological perspective*. Beverly Hills, Calif.: Sage-Halsted.
- Raiffa, Howard (1982). *The Art and Science of Negotiation*. Cambridge: Harvard Press.
- Rognes, J. (1994). Norway. In A. Blum and A. Rahim (eds). *Global Perspectives on Organizational conflicts*. New York: Praeger.
- Rousseau, Denise (1985). Issues of level in organizational research: multilevel and cross-level perspectives. *Research in Organizational Behavior*, vol.7:1-37.
- Samuelson, W.F. and Bazerman, M.H. (1985). Negotiating under the winner's curse. In V. Smith (Ed.), *Research in Experimental Economics*, 3: Greenwich, CT: JAI Press.
- Schulz, J.W., and Pruitt, D.G. (1978) The effects of mutual concern on joint welfare. *Journal of Experimental Soc Psychology*. 14 :480-492.
- Sen, A.K. (1970). *Collective choice and individual values*. New York: Holden Day, 1970.
(quoted in Pruitt and Carnevale, 1982).
- Shapiro, D. and Bies, R. (1994). Threats, bluffs and disclaimers in negotiations. *Organizational behavior and human decision processes*, 60, 14-35.
- Shapiro, D. and Rognes, J. (1996). Can a dominating orientation enhance the integrativeness of negotiated agreements. *Negotiation Journal*, 12, 81-90 91.
- Shavelson, Richard (1981). *Statistical reasoning for the behavioral sciences*. Boston: Allyn and Bacon, Inc.
- Shubik, M. (1975). *Game theory and related approaches to social behavior*. Cambridge, Ma: MIT Press.
- Simon, Herbert A. (1990). Invariants of human behavior. *Annual Review of Psychology*, 41: 1-19.
- Snizek, J.A. (1992). Groups under uncertainty: An examination of confidence in group decision making. *Organizational Behavior and Human Decision Processes*, 52: 124-155.
- Spector, P.E. (1981). *Research Designs*, Beverly Hills, Sage University Papers, 11-28.
- Stasser, G., Taylor, L.A., and Hanna, C. (1989). Information sampling in structured and unstructured discussions of three- and six-person groups. *Journal of Personality and Social Psychology*, 57(1): 67-78.
- Stasser, G and Titus, W. (1987). Effects of information load and percentage of shared information on the dissemination of unshared information during group discussion. *Journal of Personality and Social Psychology*, vol.53, 1: 81-93.
- Steiner, Ivan D. (1972). *Group Process and Productivity*. New York: Academic Press.

- Tabachnick, Barbara G. and Fidell, Linda S. (1983). *Using Multivariate Statistics*. New York: Harper and Row.
- Thompson, L.A. (1990a). Negotiation behavior and outcomes: Empirical evidence and theoretical issues. *Psychological Bulletin*, 108 (3): 515-532.
- Thompson, L.A. (1990b). An examination of naive and experienced negotiators. *Journal of Personality and Social Psychology*, 59 (1): 82-90.
- Thompson, L.A. (1991). Information exchange in negotiation. *Journal of Experimental Social Psychology*, 27:161-179.
- Thompson, L.A., Peterson, E., and Brodt, S. (1996). Team negotiation: An examination of integrative and distributive bargaining. *Journal of Personality and Social Psychology*, 70(1): 66-78.
- Thompson, L.A. and Hastie, R. (1990a). Social Perception in Negotiation. *Organizational Behavior and Human Decision Processes*, 47: 98-123.
- Thompson, L.A., and Hastie, R. (1990b). Judgment tasks and biases in negotiation. In M.H. Bazerman, R.J. Lewicki, and B.H. Sheppard (Eds.) *Research on Negotiation in Organizations*, (31-54). Greenwich, CT: JAI Press.
- Thompson, L.A., Mannix, E. and Bazerman M.H. (1988). Group negotiation: Effects of decision rule, agenda and aspiration. *Journal of Personality and Social Psychology*, 54(1): 86-95.
- Thompson, L.A., Peterson, E. and Kray, L. (1995). Social context in negotiation: An information processing perspective. In R.M. Kramer & D. M. Messick (Eds.), *Negotiation as a Social Process*. London; Sage Publications.
- Timmermans, D. (1993). The impact of task complexity on information use in multi-attribute decision making. *Journal of Behavioral Decision Making*, 6: 95-111.
- Tindale, R.Scott (1993). Decision errors made by individuals and groups. In N. John Castellan, Jr. *Individual and Group Decision making*. Hillsdale, New Jersey: Lawrence Erlbaum Associates (109-124).
- Tripp, T.M. and Sondak, H. (1992). An evaluation of dependent variables in experimental negotiation studies: Impasse rates and Pareto optimality. *Organizational Behavior and Human Decision Processes*, 51: 273-295.
- Tversky, A. and Kahneman, D. (1974). Judgement under uncertainty: Heuristics and biases. *Science*, 185: 1124-1131.
- Tyler, T. (1986) When does procedural justice matter in organizational settings? In R.J. Lewicki, B.H. Sheppard and M.H. Bazerman (Eds), *Research on negotiation in organizations* (Vol 1, pp 7 - 24). Greenwich, CT: JAI Press.

Walton, R.E. and Mckersie, R.B. (1965). *A Behavioral Theory of Labor Negotiations: An analysis of a social interaction system*. New York: McGraw-Hill.

Weingart, L. Bennett, Rebecca, and Brett, Jeanne M. (1993). The impact of consideration of issues and motivational orientation on group negotiation process and outcome. *Journal of Applied Psychology*, 78(3): 504-517.

White, S.B., Valley, K.L., Bazerman, M.H, Neale, M.A. and Peck, S.R. (1994). Alternative models of price behavior in dyadic negotiations: Market prices, reservation prices, and negotiator aspirations. *Organizational Behavior and Human Decision Processes*, 57(3): 430-447.

Yetton, P. W. and Bottger, P.C. (1982). Individual versus group problem solving: An empirical test of a best member strategy. *Organizational Behavior and Human Decision Performance*, 29: 307-321.

Yukl, Gary A., Malone, Michael P., Hayslip, Bert, and Pamin, Thomas A. (1976). The effects of time pressure and issue settlement order on integrative bargaining. *Sociometry*, 39(3): 277-281.

Appendices

Appendix I

Questionnaires

Four questionnaires were used to measure the intermediate and outcome variables across the different conditions. Two questionnaires are included in this appendix: the dyadic questionnaire for dyads with 4 issues, and the group questionnaire for groups of 4 with 10 issues.

The questionnaires for the dyads were as similar as possible to the questionnaires for groups however, the dyadic questionnaires did not include questions 6g or 6h. These questions were related to decision rules which are possible only in groups. Within dyads and groups of 4, the exact same questionnaires were used, except that in the high issue complexity condition, 10 negotiating issues were listed instead of 4. Minor language adjustments were made so that the questions made sense in either the dyadic or group context.

As noted in the main body of the dissertation, this questionnaire included additional questions that were not related to our current hypotheses. Therefore the questions translated into English are those specifically related to our hypotheses and listed in Chapter 6. These translations will be presented after the Norwegian questionnaires.

DYADIC QUESTIONNAIRE: Example from low issue complexity condition

no. _____

din rolle økonomi.
 FoU.

1) Hvis gruppen din ble enige om en avtale, hvorfor aksepterte du avtalen?

- a. Jeg syntes det var et akseptabelt utfall for meg
- b. Jeg syntes det var et godt utfall for meg
- c. Jeg syntes det var et akseptabelt utfall for oss
- d. Jeg syntes det var et godt utfall for oss

2) Fortalte du motparten hvilke saker som var mest viktige for deg (gav deg mest poeng) ja nei

3) Av og til viser partene hverandre sine poeng. Viste du ditt poengskjema til din motpart? ja nei

4) Hva tror du var den mest viktige saken (for eksempel, Lokaler) for motpart?

Rapporteringssystemer	Testmetoder	Produktansvar	Lokaler

5) Følte du i forhandlingene dersom en av dere vant, så ville den annen tape ja av og til nei

6) Hvordan organiserte dere forhandlingen?

I hvilken grad gir følgende utsagn en god beskrivelse av forhandlingsprosessen:

	i liten grad		i stor grad		
a. En av dere hjalp med til å koordinere prosessen	1	2	3	4	5
b. Du forklarte hvilke saker som var viktigst for deg og motparten hvilken som var viktig for seg.	1	2	3	4	5
c. Dere brukte tid i begynnelsen til å diskutere hvordan dere skulle gå fram for å løse oppgaven	1	2	3	4	5
d. Dere diskuterte alle sakene sammen	1	2	3	4	5
e. Dere bestemte dere for å behandle sakene en og en	1	2	3	4	5
f. Dere byttet saker (jeg vil gi deg sak 2 hvis du vil gi meg sak 4)	1	2	3	4	5
g. Dere ble enige om mer enn en sak om gangen	1	2	3	4	5

7) Tror du at din viktigste sak også var viktigste sak for motparten? ja nei

8) Hva var ditt primære mål i forhandlingene?

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for begge
- annet (spesifiser) _____

9) Skiftet du målsetting underveis i forhandlingene? ja nei

10) Før forhandlingene startet, hvilke primære mål forventet du at motpartene hadde?

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for begge
- annet (spesifiser) _____

11) Etter forhandlingene, hva tror du faktisk var motpartenes primære mål i forhandlingene?

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for begge
- annet (spesifiser) _____

12) Hvor sikker er du i vurderingene av motparten? Usikker Sikker
1 2 3 4 5

13) Egen atferd i forhandlingene:

	liten grad		i stor grad		
a. Jeg stilte mange spørsmål	1	2	3	4	5
b. Jeg gav mye informasjon	1	2	3	4	5
c. Jeg var ærlig	1	2	3	4	5
d. Jeg kom med mange trusler	1	2	3	4	5

e. Jeg argumenterte like mye for hver sak	1	2	3	4	5
14) Motpartenes atferd i forhandlingene	liten grad		i stor grad		
a. Motparten stilte mange spørsmål	1	2	3	4	5
b. Motparten gav mye informasjon	1	2	3	4	5
c. Motparten var ærlig	1	2	3	4	5
d. Motparten kom med mange trusler	1	2	3	4	5
e. Motparten brukte mange argumenter for hver sak	1	2	3	4	5

15) I hvilken grad var forhandlingsprosessen preget av følgende:	i liten grad		i stor grad		
a. informasjonsutveksling	1	2	3	4	5
b. argumentasjon for sakene	1	2	3	4	5
c. konstruktiv problemløsning	1	2	3	4	5

	misfornøyd		fornøyd		
16) Hvor fornøyd er du med forhandlingsresultatet?	1	2	3	4	5
17) Hvor fornøyd er du med forhandlingsprosessen?	1	2	3	4	5
18) Hvor fornøyd er du med din individuelle fortjeneste?	1	2	3	4	5

	urettferdig		rettferdig		
19) Hvor rettferdig synes du resultatet vart?	1	2	3	4	5
20) Hvor rettferdig synes du forhandlingsprosessen var?	1	2	3	4	5

21) Alder _____

22) Kjønn Kvinne Mann

23) Utdannelse (antall år utover gymnas) _____ år

24) Arbeidserfaring _____ år

Takk!

GROUP QUESTIONNAIRE: Example high issue complexity condition

no. ____

rollen din økonomi. markedsføring
 FoU produksjon

1) Hvis gruppen din ble enige om en avtale, hvorfor aksepterte du avtalen?

- a. Jeg syntes det var et akseptabelt utfall for meg
- b. Jeg syntes det var et godt utfall for meg
- c. Jeg syntes det var et akseptabelt utfall for gruppen
- d. Jeg syntes det var et godt utfall for gruppen

2) Fortalte du andre i gruppen hvilke saker som var mest viktige for deg (gav deg mest poeng) ja nei

3) Av og til viser partene hverandre sine poeng. Viste du ditt poengskjema til en eller flere andre i din gruppe? ja nei

4) Hva tror du var den mest viktige saken (for eksempel, Lokaler) for motparter

	Rapport-erings systemer	Test-metoder	Produkt ansvar	Lokaler	Produk-ter	Markeds-førings-kamp.	distrib.	info. direktør	over-skudd	patent søknad
Økonomi										
Markedsføring										
Produksjons										
FoU										

5) Følte du i forhandlingene dersom en av gruppemedlemmene vant, så ville de andre tape ja av og til nei

6) Hvordan organiserte gruppen din forhandlingen?

I hvilken grad gir følgende utsagn en god beskrivelse av forhandlingsprosessen:

	i liten grad				i stor grad
a. En av deltakerne hjalp til med å koordinere prosessen	1	2	3	4	5
b. Alle beskrev etter tur hvilke saker som var viktigst for dem	1	2	3	4	5
c. Gruppen brukte tid i begynnelsen til å diskutere hvordan vi skulle gå fram for å løse oppgaven	1	2	3	4	5
d. Gruppen diskuterte sakene sammen	1	2	3	4	5
e. Gruppen brukte flertalls avstemming for å ta en beslutning ved minst en anledning	1	2	3	4	5
f. Gruppen brukte full enighet som beslutningskriterium	1	2	3	4	5
g. Gruppen bestemte seg for å behandle sakene en og en	1	2	3	4	5
h. Medlemmene i gruppen byttet saker (jeg vil gi deg sak 2 hvis du vil gi meg sak 4)	1	2	3	4	5
i. Gruppen ble enig om å behandle mer enn en sak om gangen	1	2	3	4	5

7) Tror du at din viktigste sak også var viktigste sak for en eller flere av de andre i gruppen? ja nei

8) Hva var ditt primære mål i forhandlingene?

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for alle
- annet (spesifiser) _____

9) Endret du målsetting underveis i forhandlingene? ja nei

10) Før forhandlingene startet, hvilke primære mål forventet du at motpartene hadde?

økonomi motpart

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for alle
- annet (spesifiser) _____

markedsføring motpart

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for alle
- annet (spesifiser) _____

produksjon motpart

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for alle
- annet (spesifiser) _____

FoU motpart

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for alle
- annet (spesifiser) _____

11) Etter forhandlingene, hva tror du faktisk var motpartenes primære mål i forhandlingene?

økonomi motpart

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for alle
- annet (spesifiser) _____

markedsføring motpart

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for alle
- annet (spesifiser) _____

produksjon motpart

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for alle
- annet (spesifiser) _____

FoU motpart

- maksimere egen fortjeneste
- maksimere egen fortjeneste og samlet fortjeneste for alle
- annet (spesifiser) _____

12) Hvor sikker er du i vurderingene av motpartene?

1 2 3 4 5

13) Egen atferd i forhandlingene

i liten grad

i stor grad

- | | | | | | |
|---|---|---|---|---|---|
| a. Jeg stilte mange spørsmål | 1 | 2 | 3 | 4 | 5 |
| b. Jeg gav mye informasjon | 1 | 2 | 3 | 4 | 5 |
| c. Jeg var ærlig | 1 | 2 | 3 | 4 | 5 |
| d. Jeg kom med mange trusler | 1 | 2 | 3 | 4 | 5 |
| e. Jeg argumenterte like mye for hver sak | 1 | 2 | 3 | 4 | 5 |

14) Motpartenes atferd i forhandlingene

i liten grad

i stor grad

økonomi motpart

- | | | | | | |
|---|---|---|---|---|---|
| a. Motparten stilte mange spørsmål | 1 | 2 | 3 | 4 | 5 |
| b. Motparten gav mye informasjon | 1 | 2 | 3 | 4 | 5 |
| c. Motparten var ærlig | 1 | 2 | 3 | 4 | 5 |
| d. Motparten kom med mange trusler | 1 | 2 | 3 | 4 | 5 |
| e. Motparten argumenterte like mye for hver sak | 1 | 2 | 3 | 4 | 5 |

markedsføring motpart

- | | | | | | |
|------------------------------------|---|---|---|---|---|
| a. Motparten stilte mange spørsmål | 1 | 2 | 3 | 4 | 5 |
| b. Motparten gav mye informasjon | 1 | 2 | 3 | 4 | 5 |
| c. Motparten var ærlig | 1 | 2 | 3 | 4 | 5 |
| d. Motparten kom med mange trusler | 1 | 2 | 3 | 4 | 5 |

e. Motparten argumenterte like mye for hver sak 1 2 3 4 5

Produksjon motpart

a. Motparten stilte mange spørsmål 1 2 3 4 5

b. Motparten gav mye informasjon 1 2 3 4 5

c. Motparten var ærlig 1 2 3 4 5

d. Motparten kom med mange trusler 1 2 3 4 5

e. Motparten argumenterte like mye for hver sak 1 2 3 4 5

FoU motpart

1 2 3 4 5

a. Motparten stilte mange spørsmål

b. Motparten gav mye informasjon 1 2 3 4 5

c. Motparten var ærlig 1 2 3 4 5

d. Motparten kom med mange trusler 1 2 3 4 5

15) I hvilken grad var forhandlingsprosessen preget av følgende: i liten grad i stor grad

a. informasjonsutveksling 1 2 3 4 5

b. argumentasjon for sakene 1 2 3 4 5

c. konstruktiv problemløsning 1 2 3 4 5

misfornøyd

fornøyd

16) Hvor fornøyd er du med forhandlingsresultatet? 1 2 3 4 5

17) Hvor fornøyd er du med forhandlings prosessen? 1 2 3 4 5

18) Hvor fornøyd er du med din individuelle fortjeneste? 1 2 3 4 5

urettferdig

rettferdig

19) Hvor rettferdig synes du resultatet var? 1 2 3 4 5

20) Hvor rettferdig synes du forhandlingsprosessen var? 1 2 3 4 5

21) Alder _____

22) Kjønn kvinne mann

23) Utdannelse (antall år utover gymnas) _____ år

24) Arbeidserfaring _____ år

An English translation of the demographic questions and those related to our hypotheses are given below.

Demographic questions asked:

1. Age: Alder

2. Sex: Kjønn

Female: Kvinne

Male: Mann

3. Education: Utdannelse

4. Work experience: Arbeidserfaring

The demographic variables were measured by Questions 21-24, on both the dyadic and group questionnaire.

Questions measuring judgement accuracy:

The three questions originally intended to measure judgement accuracy are Questions 4, 5, and 7 from the dyadic and group questionnaires. The translation are listed below:

Question	Norwegian		English	
	Dyad	Group	Dyad	Group
4	Hva tror du var den mest viktige saken (for eksempel Lokaler) for motpart?	Hva tror du var den mest viktige saken (for eksempel Lokaler) for motparten?	Which negotiating issue was most important to the other party? (the issues were listed in the table)	Which negotiating issue was most important to the other parties?
5	Følte du i forhandlingene dersom en av dere vant, så ville den annen tape	Følte du i forhandlingene dersom en av gruppelemmene vant, så ville de andre tape	Did you feel that in the negotiation if one of you won the other would lose?	Did you feel that in the negotiation if one of the group members won other group members would lose?
scale	ja, av og til, nei		yes, sometimes, no	
7	Tror du at din viktigste sak også var viktigste sak for motparten?	Tror du at din viktigste sak også var viktigste sak for en eller flere av de andre i gruppen?	Do you believe that your most important issue is also the most important issue for the other party?	Do you believe that your most important issue is also the most important issue for one or more of the others in the group?
scale	ja, nei		yes, no	

Question measuring information sharing

The question measuring information sharing was Question 2 on both the dyadic and group questionnaires.

	Norwegian		English	
Question	Dyad	Group	Dyad	Group
2	Fortalte du motparten hvilke saker som var mest viktige for deg (gav deg mest poeng)?	Fortalte du andre i gruppen hvilke saker som var mest viktige for deg (gav deg mest poeng)?	Did you tell the other party which issues were most important to you (gave you the most points)?	Did you tell others in the group which issues were most important to you (gave you the most points)?
scale	ja, nei		yes, no	

Questions measuring to procedural structure

The translations for the questions regarding procedural structure are listed below. All these questions were asked in question 6 on both the dyadic and group questionnaire.

	Norwegian		English		
Question	Dyad	Group	Dyad	Group	
6	Hvordan organiserte dere forhandlingen? I hvilken grad gir følgende utsagn en god beskrivelse av forhandlingsprosessen.		How did you (plural) organise the negotiation? To what degree do the following statements describe the negotiation process.		
6.d	6.d	Dere diskuterte alle sakene sammen.	Gruppen diskuterte sakene sammen.	You (plural) discussed all the issues together.	The group discussed the issues together.
6.e	6.g	Dere bestemte dere for å behandle sakene en og en.	Gruppen bestemte seg for å behandle sakene en og en.	You (plural) decided on issues one by one.	The group decided on issues one by one.
6.g	6.i	Dere ble enige om mer enn en sak om gangen.	Gruppen ble enig om å behandle mer enn en sak om gangen.	You (plural) agreed on more than one issue at a time.	The group agreed on more than one issue at a time.
6.b	6.b	Du forklarte hvilke saker som var viktigst for deg og motparten hvilken som var viktig for seg.	Alle beskrev etter tur hvilke saker som var viktigst for dem.	You explained which issue was important to you and the other party which issue was important to him/her.	Everyone described which issue was important for him or her.
6.a	6.a	En av dere hjalp med til å koordinere prosessen.	En av deltakerne hjalp til med å koordinere prosessen.	One of you helped to coordinate the process.	One of the parties helped to coordinate the process.
6.c	6.c	Dere brukte tid i begynnelsen til å diskutere hvordan dere skulle gå fram for å løse oppgaven.	Gruppen brukte tid i begynnelsen til å diskutere hvordan vi skulle gå fram for å løse oppgaven.	You (plural) used time in the beginning of the negotiation to discuss how you would proceed to solve the task.	The group used time in the beginning of the negotiation to discuss how you would proceed to solve the task.

scale i liten grad/i stor grad (1-5) to a small degree/to a large degree (1-5)

Questions measuring problem solving and trading issues variables

		Norwegian		English	
Question		Dyad	Group	Dyad	Group
6		Hvordan organiserte dere forhandlingen? I hvilken grad gir følgende utsagn en god beskrivelse av forhandlingsprosessen.		How did you (plural) organise the negotiation? To what degree do the following statements describe the negotiation process?	
6.f	6.h	Dere byttet saker (jeg vil gi deg sak 2 hvis du vil gi meg sak 4).	Medlemmene i gruppen byttet saker (jeg vil gi deg sak 2 hvis du vil gi meg sak 4).	You (plural) traded issues (I will give you issue 2 if you give me issue 4).	
15		I hvilken grad var forhandlingsprosessen preget av følgende:		To what degree was the negotiation process characterized by the following statements:	
15.c	15.c	konstruktiv problemløsning.	konstruktiv problemløsning.	Constructive problem solving.	Constructive problem solving.
scale		i liten grad/i stor grad (1-5)		to a small degree/to a large degree (1-5)	

Questions measuring the dependent variable: social psychological benefit

We will present the translations of the questions used to measure the social psychological benefit variable.

		Norwegian		English	
Q.		Dyad	Group	Dyad	Group
16		Hvor fornøyd er du med forhandlingsresultatet?		How satisfied were you with the negotiation result?	
17		Hvor fornøyd er du med forhandlingsprosessen?		How satisfied were you with the negotiation process?	
18		Hvor fornøyd er du med din individuelle fortløpelse?		How satisfied were you with your individual result?	
scale		misfornøyd -fornøyd (1-5)		Satisfied -dissatisfied (1-5).	
19		Hvor rettferdig synes du resultatet var?		How fair do you think the results were?	
20		Hvor rettferdig synes du forhandlingsprosessen var?		How fair do you think the negotiation process was?	
scale		urettferdig- rettferdig (1-5)		unfair-fair (1-5)	

Appendix II

Negotiation Payoff matrices

Negotiation Payoff Matrix for dyadic (party 1 and party 2) and group (party 1, party 2, party 3, and party 4) for the low issue complexity condition.

	<i>alternative</i>	<i>issue 1</i>	<i>issue 2</i>	<i>issue 3</i>	<i>issue 4</i>
Party 1	A	6000	3000	750	1500
	B	5250	2625	656.25	1312.5
	C	4500	2250	562.5	1125
	D	3750	1875	468.75	937.5
	E	3000	1500	375	750
	F	2250	1125	281.25	562.5
	G	1500	750	187.5	375
	H	750	375	93.75	187.5
	I	0	0	0	0
Party 2	A	0	0	0	0
	B	375	750	187.5	93.75
	C	750	1500	375	187.5
	D	1125	2250	562.5	281.25
	E	1500	3000	750	375
	F	1875	3750	937.5	468.75
	G	2250	4500	1125	562.5
	H	2625	5250	1312.5	656.25
	I	3000	6000	1500	750
Party 3	A	0	0	3000	6000
	B	93.75	187.5	2625	5250
	C	187.5	375	2250	4500
	D	281.25	562.5	1875	3750
	E	375	750	1500	3000
	F	468.75	937.5	1125	2250
	G	562.5	1125	750	1500
	H	656.25	1312.5	375	750
	I	750	1500	0	0
Party 4	A	1500	750	0	0
	B	1312.5	656.25	750	375
	C	1125	562.5	1500	750
	D	937.5	468.75	2250	1125
	E	750	375	3000	1500
	F	562.5	281.25	3750	1875
	G	375	187.5	4500	2250
	H	187.5	93.75	5250	2625
	I	0	0	6000	3000

The payoff matrix for the 4 issue condition is identical for dyads and groups of 4. After the dyadic negotiation was constructed two additional parties were added. In the dyadic negotiation issues 1 and 2 were most important for the two parties and issues 3 & 4 were of secondary importance. In the group of 4 negotiation the additional parties were given issues 3 & 4 as their most important issues and were given the same pay off structure for issues 1 and 2 as the dyadic parties were given for issues 3 and 4. The same solution for the dyads and groups gave the highest quality outcomes.

In this negotiation task for dyads the highest joint outcome in this task is A-I-I-A (Joint benefit 15,000) and a compromise solution would be E-E-E-E (Joint benefit 11,250). For party 1, issue 1 earns the most profit (is the most important issue) and for party 2, issue 2 earns the most profit (is the most important). Issues 3 & 4 although of lesser value, need to be traded to achieve the highest quality outcome. In the group of 4 the highest joint benefit is also reached by the agreement A-I-I-A, however with an addition of two more players the total group joint benefit increases to 30,000. A compromise solution is the same as in the dyad, E-E-E-E and the joint benefit from this agreement is 22,500. Both parties 1 and 2 have the same priority issues in the dyadic and the group of 4 negotiation tasks. Parties 3 and 4 have issues 3 and 4 as their priority issues. In the group of 4 task each party has one high priority issue and if these trades are made the highest quality outcome can be achieved. In the dyadic task 2 trades had to be made: first, trades on the parties most important issues needed to be made and then a trade on issues 3 and 4 which were not as important. However, all parties in the dyadic and group negotiation had 1 high priority issue that they needed to trade and then a second less important issue that they also needed to trade to achieve the highest quality outcome. In groups of 4 the issue of secondary importance for one group member was the most important issue for another group member.

The high issue complexity task was developed based on the logic of the low issue complexity task. The same payoff structure of 4 issues was used and then an additional 4 issues, with the same payoff structure as the first 4 issues (only scaled), and 2 distributive issues were added.

Payoff Matrix for 2 parties (dyads) and 4 parties (groups) on 4 and 10 issues.

Issues	alts	Party 1	Party 3	Party 4	Party 2
1	a	6000	0	1500	0
	b	5250	93.75	1312.5	375
	c	4500	187.5	1125	750
	d	3750	281.25	937.5	1125
	e	3000	375	750	1500
	f	2250	468.75	562.5	1875
	g	1500	562.5	375	2250
	h	750	656.25	187.5	2625
	i	0	750	0	3000
2	a	3000	0	750	0
	b	2625	187.5	656.25	750
	c	2250	375	562.5	1500
	d	1875	562.5	468.75	2250
	e	1500	750	375	3000
	f	1125	937.5	281.25	3750
	g	750	1125	187.5	4500
	h	375	1312.5	93.75	5250
	i	0	1500	0	6000
3	a	750	3000	0	0
	b	656.25	2625	750	187.5
	c	562.5	2250	1500	375
	d	468.75	1875	2250	562.5
	e	375	1500	3000	750
	f	281.25	1125	3750	937.5
	g	187.5	750	4500	1125
	h	93.75	375	5250	1312.5
	i	0	0	6000	1500
4	a	1500	6000	0	0
	b	1312.5	5250	375	93.75
	c	1125	4500	750	187.5
	d	937.5	3750	1125	281.25
	e	750	3000	1500	375
	f	562.5	2250	1875	468.75
	g	375	1500	2250	562.5
	h	187.5	750	2625	656.25
	i	0	0	3000	750
High issue complexity tasks (dyads and groups) include issues 1-10					
5	a	0	3000	1000	4000
	b	500	2500	1500	3500
	c	1000	4000	0	3000
	d	1500	500	3500	2500
	e	2000	2000	2000	2000
	f	2500	3500	500	1500
	g	3000	0	4000	1000
	h	3500	1500	2500	500
	i	4000	1000	3000	0
6	a	1440	5760	0	0
	b	1260	5040	360	90
	c	1080	4320	720	180
	d	900	3600	1080	270

	e	720	2880	1440	360
	f	540	2160	1800	450
	g	360	1440	2160	540
	h	180	720	2520	630
	i	0	0	2880	720
7	a	720	2880	0	0
	b	630	2520	720	180
	c	540	2160	1440	360
	d	450	1800	2160	540
	e	360	1440	2880	720
	f	270	1080	3600	900
	g	180	720	4320	1080
	h	90	360	5040	1260
	i	0	0	5760	1440
8	a	2000	1500	500	0
	b	1750	1250	750	250
	c	1500	2000	0	500
	d	1250	250	1750	750
	e	1000	1000	1000	1000
	f	750	1750	250	1250
	g	500	0	2000	1500
	h	250	750	1250	1750
	i	0	500	1500	2000
9	a	0	720	0	2880
	b	720	630	180	2520
	c	1440	540	360	2160
	d	2160	450	540	1800
	e	2880	360	720	1440
	f	3600	270	900	1080
	g	4320	180	1080	720
	h	5040	90	1260	360
	i	5760	0	1440	0
10	a	2880	0	720	0
	b	2520	180	630	720
	c	2160	360	540	1440
	d	1800	540	450	2160
	e	1440	720	360	2880
	f	1080	900	270	3600
	g	720	1080	180	4320
	h	360	1260	90	5040
	i	0	1440	0	5760

Appendix III

Instructions orally given to participants.

The students were told that they would be handed out general information about the negotiation. The general information is presented in appendix IV. They were told that they would have 15 minutes to read through this general information.

Subjects were told that they would be given a task and their preferences on the various issues were given by the numbers beside the alternatives. These numbers represented profit to their department. The subjects were instructed that they would have 50 minutes to negotiate after receiving their preference sheets and role play information.

Before handing out the preference sheets, the subjects were asked if they had any questions and were reminded that no agreement was worse than any agreement they could reach, and that preference points represented profit to their department.

If groups were not finished 15 minutes before the 50 minutes for the negotiation had expired they were told they had 15 minutes to finish. Subjects were then debriefed and

Appendix IV

General Information for the role play and the Norwegian role plays.

The role plays were all written in Norwegian. A brief English summary of the main points will be given here. For a more detailed translation contact the author.

The background information introduces the students to the negotiation scenario. Their company is a pharmaceutical company that is having increasing problems with strategic communication and control. They are told that their administrative director has called them into a meeting, however she cannot attend the meeting today. Since the senior department managers have not been able to reach agreement on 4 or 10 central issues, they will be given one final chance to reach agreement. They will be given a little under an hour to resolve their differences or she will call in a consulting firm to make the necessary decisions. The students are told that the department managers consider the use of consultants dangerous and want to avoid calling them in.

BFW farmasøytisk a/s

Bakgrunn

Stadig større strategiske kommunikasjons- og kontrollproblemer i BFW farmasøytisk a/s har ført til at administrerende direktør Borghild Tøten har innkalt til et ledermøte. En innkalling til et annet viktig møte i Statens Legemiddelsentral betyr at Borghild ikke kan selv være tilstede.

Borghild har tidligere konsentrert seg om en fremtredende salgsrolle i bedriften, men etterhvert som mangelen på enighet omkring sentrale oppgaver ble kritisk forlangte hun enighet på fire viktige punkter innen en viss tidsramme.

Denne fristen utløper nå om litt over en time, og dette er siste mulighet for å oppnå enighet før Borghild innkaller et eksternt konsulentbyrå, McCoopersons, for å diktere løsninger med hennes samtykke. Som avdelingsleder ser du stor fare i en slik situasjon, og du er derfor meget interessert i å finne en løsning og unngå at konsulentene overtar.

Avdelingslederne fra økonomi, markedsføring, produksjon og forskning-og-utvikling («FoU») er alle tilstede på møtet.

Beslutningene som nå må taes inkluderer rapportering, produktsansvar, utstyr og beslutning om lokale. Det er viktig at avdelingslederne blir enige om bedriftens framtidvisjon.

Sammen med de tre andre avdelingslederne vil du derfor måtte forhandle frem en løsning på alle områder. Dere vil ofte ha forskjellige synspunkter om emner som er viktig for dere, men er også klar over at det er viktig for bedriftens fremtid å komme til enighet.

For at du kan forberede deg for møte, må du først lese raskt gjennom alle forhandlings sakene. Etterpå når du har lest om case får du en beskrivelse av dine preferanser for hver sak.

Hvert forhandlingspunkt har ni mulige utfall, og kun ett utfall kan velges for hvert punkt.

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Bakgrunn

Stadig større strategiske kommunikasjons- og kontrollproblemer i BFW farmasøytisk a/s har ført til at administrerende direktør Borghild Tøten har innkalt til et ledermøte. En innkalling til et annet viktig møte i Statens Legemiddelsentral betyr at Borghild ikke kan selv være tilstede.

Borghild har tidligere konsentrert seg om en fremtredende salgsrolle i bedriften, men etterhvert som mangelen på enighet omkring sentrale oppgaver ble kritisk forlangte hun enighet på ti viktige punkter innen en viss tidsramme.

Denne fristen utløper nå om litt over en time, og dette er siste mulighet for å oppnå enighet før Borghild innkaller et eksternt konsulentbyrå, McCoopersons, for å diktere løsninger med hennes samtykke. Som avdelingsleder ser du stor fare i en slik situasjon, og du er derfor meget interessert i å finne en løsning og unngå at konsulentene overtar.

Avdelingslederne fra økonomi, markedsføring, produksjon og forskning-og-utvikling («FoU») er alle tilstede på møtet.

Beslutningene som nå må taes inkluderer koordinering og rapportering mellom forskjellige avdelinger, strategier for produktutvikling og markedsføring, samt beslutninger om fordeling av ressurser m.v. Det er viktig at avdelingslederne blir enige om bedriftens framtidvisjon.

Sammen med de tre andre avdelingslederne vil du derfor måtte forhandle frem en løsning på alle områder. Dere vil ofte ha forskjellige synspunkter om emner som er viktig for dere, men er også klar over at det er viktig for bedriftens fremtid å komme til enighet.

For at du kan forberede deg for møte, må du først lese raskt gjennom alle forhandlings sakene. Etterpå når du har lest om case får du en beskrivelse av dine preferanser for hver sak.

Hvert forhandlingspunkt har ni mulige utfall, og kun ett utfall kan velges for hvert punkt.

Forhandlingssaker

Følgende forhandlingspunkter må vurderes i løpet av møtet:

Rapporteringssystemer

Det eksisterende rapporteringssystemet for FoU er ikke tilfredsstillende, og må forandres. Mulige løsninger strekker seg fra full rapport (mao. detaljerte finansielle analyser, ressursutnyttelse, strategi og kommentarer på avdelingsresultater) til bare kostnadsanalyse rapport på månedlig basis, (rapport skrevet av FoU) til ingen rapportskrivning men bare levering av informasjon fra FoU til økonomiavdelingen og økonomiavdeling skriver rapport.

- a) full rapport hver måned
- b) full rapport annenhver måned
- c) full rapport hver sjettede måned
- d) full rapport årlig
- e) kostnadsanalyse rapport hver måned
- f) kostnadsanalyse rapport annenhver måned
- g) kostnadsanalyse rapport hver sjettede måned
- h) kostnadsanalyse rapport årlig
- i) ingen rapport levering men bare informasjon som økonomiavdelingen trenger

Testmetoder og teknisk utstyr for nye farmasøytiske produkter

Når nye farmasøytiske produkter utvikles eksisterer det to mulige metoder for testing: Den tradisjonelle «prøve-og- feile» metoden, og en nyutviklet atomkonstruksjonsmetode. Videre må type teknisk utstyr vurderes, ettersom nytt teknisk utstyr og nye datamaskiner vil påvirke kvaliteten og hastigheten på testdataene. Valg av metode er knyttet til valg av teknisk utstyr, ettersom atomkonstruksjonsmetoden vil kreve investering i nytt teknisk utstyr. Mulige løsninger strekker seg fra eksisterende metoder og utstyr, til nye metoder, nytt teknisk utstyr, og nye datamaskiner.

- a) tradisjonell prøve og feile metode: eksisterende teknisk utstyr
- b) tradisjonell prøve og feile metode: eksisterende teknisk utstyr med utbedringer
- c) tradisjonell prøve og feile metode: nytt teknisk utstyr
- d) tradisjonell prøve og feile metode: eksisterende teknisk utstyr og en ny datamaskin
- e) ny atomkonstruksjons metode: (krever) nytt teknisk utstyr
- f) ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og en datamaskin
- g) ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og to datamaskiner
- h) ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og tre datamaskiner
- i) ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og fire datamaskiner

Produktansvar

Det ansees for essensielt at ansvaret for organisering og koordinering av produktutvikling ligger hos et klart identifisert individ eller en gruppe. Mulige løsninger strekker seg fra administrerende direktør (individ), til en prosjektgruppe av ansatte.

- a) administrerende direktør
- b) avdelingsleder økonomi
- c) avdelingsleder markedsføring
- d) avdelingsleder produksjon

- e) team bestående av administrerende direktør og avdelingslederne
- f) team bestående av avdelingslederne
- g) team bestående av mellomlederne
- h) team bestående av mellomledere og prosjektgruppe av ansatte
- i) prosjektgruppe av ansatte

Lokaler

Leiekontrakten på de eksisterende lokalene er i ferd med å løpe ut. Beslutningsalternativene strekker seg fra en forlengelse av den eksisterende kontrakten på 15 år, til å finne nye lokaler i en forskningspark hvor der er mange som driver med kjemi, til å finne ny lokaler i en industripark hvor der er mange forskjellige selskap som bruker nytt og likt produksjonsmetode. Kontraktene er på fra 5 til 15 år kontrakter.

- a) beholde eksisterende lokaler med kontrakt på 15 år
- b) beholde eksisterende lokaler med kontrakt på 10 år
- c) beholde eksisterende lokaler med kontrakt på 5 år
- d) nye lokaler i en forskningsparken i byen: kontrakt på 15 år
- e) nye lokaler i en forskningsparken i byen: kontrakt på 10 år
- f) nye lokaler i en forskningsparken i byen: kontrakt på 5 år
- g) nye lokaler i en industrisparken litt utenfor byen: kontrakt på 15 år
- h) nye lokaler i en industrisparken litt utenfor byen kontrakt på 10 år
- i) nye lokaler i en industrisparken litt utenfor byen kontrakt på 5 år

Markedsføringskampanjer

I tillegg til eksisterende kampanjer er det et behov for å finne frem til en avtale om fremtidige kampanjer, og de mulige beslutningsalternativene strekker seg fra generell kampanje fokusert på å bygge opp gjenkjennelse av firmanavnet nå, til en kampanje fokusert på spesifikke fremtidige produkter.

- a) generell kampanje nå: på firmanavnet
- b) generell kampanje om 1 år: på firmanavnet
- c) generell kampanje om 2 år: på firmanavnet
- d) generell kampanje om 3 år: på firmanavnet
- e) fokusert kampanje nå på produktnavnet
- f) fokusert kampanje om 1 år på produktnavnet
- g) fokusert kampanje om 2 år på produktnavnet
- h) fokusert kampanje om 3 år på produktnavnet
- i) fokusert kampanje om 4 år på produktnavnet

Produkter

En beslutning må tas på hvilken type produkt som skal utvikles for fremtidig produksjon. Produktalternativene er alle forskjellige, og har forskjellige FoU og produksjonsbehov. Beslutningsalternativene er:

- a) produkt AA
- b) produkt BB

- c) produkt CC
- d) produkt DD
- e) produkt EE
- f) produkt FF
- g) produkt GG
- h) produkt HH
- i) produkt II

Distribusjon

Distribusjonsstrategien må avklares. Beslutningsalternativene spenner fra å opprettholde det eksisterende nettverket av grossister, til å skape et nytt nasjonalt og internasjonalt ekspanderende nettverk av detaljister:

- a) opprettholde det eksisterende nettverket av grossister
- b) opprettholde det eksisterende nettverket av grossister og lokal utvidelse
- c) opprettholde det eksisterende nettverket av grossister og nasjonal utvidelse
- d) opprettholde det eksisterende nettverket av grossister og internasjonal utvidelse
- e) opprettholde det eksisterende nettverket av grossister og nasjonal og internasjonal utvidelse
- f) nytt nettverk av detaljister og lokal utvidelse
- g) nytt nettverk av detaljister og nasjonal utvidelse
- h) nytt nettverk av detaljister og internasjonal utvidelse
- i) nytt nettverk av detaljister og nasjonal og internasjonal utvidelse

Informasjonsdirektør

Administrerende direktør skal ansette informasjonsdirektør. Hun vil gjerne ha en anbefaling fra avdelingslederne. Det er 9 kandidater.

- a) kandidat 1
- b) kandidat 2
- c) kandidat 3
- d) kandidat 4
- e) kandidat 5
- f) kandidat 6
- g) kandidat 7
- h) kandidat 8
- i) kandidat 9

Fordeling av overskudd

En beslutning er nødvendig for å bestemme hvor overskudd fra nye produkter som skal fordeles til hver avdeling, og hvem som skal ta ansvar for fordelingen.

- a) Styret bestemmer beløp og fordeler det utfra avdelingenes behov.
- b) Administrerende direktør bestemmer beløp og fordeler det utfra avdelingenes behov.
- c) Administrerende direktør og avdelingsledene bestemmer beløp og fordeler det utfra avdelingenes behov.
- d) Styret bestemmer beløp og fordeler likt mellom avdelingene.
- e) Administrerende direktør bestemmer beløp og fordeler likt mellom avdelingene

- f) Administrerende direktør og avdelingsledene bestemmer beløp og fordeler likt mellom avdelingene.
- g) Styret bestemmer beløp og fordeler det utfra avdelingenes bidrag til produktet.
- h) Administrerende direktør bestemmer beløp og fordeler det utfra avdelingenes bidrag til produktet.
- i) Administrerende direktør og avdelingsledene bestemmer beløp og fordeler det utfra avdelingenes bidrag til produktet.

Strategi for patentsøknader

Det er viktig å bestemme når man skal søke patent for et nytt produkt. Noen mener det er vesentlig å søke tidlig (slik at du er garantert beskyttelse mot kopiering fra andre) og andre føler at det er bedre å vente og se om produktet passerer alle tester hos offentlige helsemyndigheter. Det er vanlig at offentlige helsemyndigheter sender produktet gjennom minst 7 prøver.

- a) begynne å søke om patent når produktet er nesten ferdig
- b) begynne å søke om patent med en gang etter at produktet er ferdig
- c) begynne å søke om patent etter første test gjennom offentlige helsemyndigheter
- d) begynne å søke om patent etter andre test gjennom offentlige helsemyndigheter
- e) begynne å søke om patent etter tredje test gjennom offentlige helsemyndigheter
- f) begynne å søke om patent etter fjerde test gjennom offentlige helsemyndigheter
- g) begynne å søke om patent etter femte test gjennom offentlige helsemyndigheter
- h) begynne å søke om patent etter sjette test gjennom offentlige helsemyndigheter
- i) begynne å søke om patent etter siste test gjennom offentlige helsemyndigheter

Du er Økonomileder

Sammen med de tre andre avdelingslederne vil du derfor måtte forhandle frem en løsning på alle områder. Hvert forhandlingspunkt har ni mulige utfall, og kun ett utfall kan velges for hvert punkt.

Når det gjelder spørsmålene som skal opp på dette møtet, er du svært entusiastisk. Du håper også å komme til enighet om de sakene der du og de andre avdelingslederne kanskje har ulike preferanser.

For å hjelpe deg til å planlegge for møte var en poengsystem laget. Dette systemet formulerer dine preferanser i en tall verdi for hvert beslutningsalternativ. På den måten kan du sammenligne hvor viktige de ulike alternativene er for deg, og også hvor viktig hvert forhandlingspunkt er. Høyest oppnåelig poengsum totalt (hvis du får alle dine mest foretrukne alternativer gjennom) er 28 050 poeng, og den lavest mulige 0. Et slikt poengsystem virker kanskje litt kunstig, men det gir et godt utgangspunkt for å sammenligne og avveie mellom alternativer.

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Forhandlingspunkter

Rapporteringssystemer

Eksisterende rapporteringssystem fra FoU er ikke tilfredsstillende. Du foretrekker at de tar mer ansvar selv, ved å lager en full rapport hver måned. Det er viktig å få mye informasjon ofte.

- a) 6000 full rapport hver måned
- b) 5250 full rapport annenhver måned
- c) 4500 full rapport hver sjette måned
- d) 3750 full rapport årlig
- e) 3000 kostnadsanalyse rapport hver måned
- f) 2250 kostnadsanalyse rapport annenhver måned
- g) 1500 kostnadsanalyse rapport hver sjette måned
- h) 750 kostnadsanalyse rapport årlig
- i) 0 ingen rapport levering kun den informasjonen som økonomiavdelingen trenger

Testmetoder og teknisk utstyr for testing av nye farmasøytiske produkter

Du foretrekker den tradisjonelle prøve-og-feil metode, med eksisterende utstyr. Du ser ingen grunn for å forandre system og investere så mye penger på nytt metoder og teknisk utstyr.

- a) 3000 tradisjonell prøve og feile metode: eksisterende teknisk utstyr
- b) 2625 tradisjonell prøve og feile metode: eksisterende teknisk utstyr med utbedringer
- c) 2250 tradisjonell prøve og feile metode: nytt teknisk utstyr
- d) 1875 tradisjonell prøve og feile metode: eksisterende teknisk utstyr og en ny datamaskin
- e) 1500 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr
- f) 1125 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og en datamaskin
- g) 750 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og to datamaskiner
- h) 375 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og tre datamaskiner
- i) 0 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og fire datamaskiner

Produktansvar

Du mener at en individ bør ha produktansvar. Administrerende direktør bør ha ansvar som innebærer å koordinere aktiviteter og presse igjennom nye produkter fordi hun har mest innflytelse på styret og hun har best oversikt over selskapet.

- a) 750 administrerende direktør
- b) 656,25 avdelingsleder økonomi
- c) 562,5 avdelingsleder markedsføring
- d) 468,75 avdelingsleder produksjon
- e) 375 team bestående av administrerende direktør og avdelingslederne
- f) 281,25 team bestående av avdelingslederne
- g) 187,5 team bestående av mellomlederne
- h) 93,75 team bestående av mellomledere og prosjektgruppe av ansatte
- i) 0 prosjektgruppe av ansatte

Lokaler

Leiekontrakten på de eksisterende lokalene er i ferd med å løpe ut. Du vil at selskapet skal være i de eksisterende lokalene lengst mulig. Det er veldig god å være så nær kundene. Eiøren har vært flink til å vedlikeholde bygningen, og har gitt selskapet mange særfordeler.

- a) 1500 beholde eksisterende lokaler med kontrakt på 15 år
- b) 1312,5 beholde eksisterende lokaler kontrakt på 10 år
- c) 1125 beholde eksisterende lokaler kontrakt på 5 år
- d) 937,5 nye lokaler i en forskningsparken i byen: kontrakt på 15 år
- e) 750 nye lokaler i en forskningsparken i byen: kontrakt i 10 år
- f) 562,5 nye lokaler i en forskningsparken i byen: kontrakt i 5 år
- g) 375 nye lokaler i en industrisparken litt utenfor byen: kontrakt på 15 år
- h) 187,5 nye lokaler i en industrisparken litt utenfor byen kontrakt på 10 år
- i) 0 nye lokaler i en industrisparken litt utenfor byen kontrakt på 5 år

Produkter

Nedenfor er et utvalg av produkter med forskjellige forsknings-og produksjon spesifikasjoner, hvorav dere skal velge ett. Produktet type du helst vil ha er Produkt II.

- a) 0 produkt AA
- b) 500 produkt BB
- c) 1000 produkt CC
- d) 1500 produkt DD
- e) 2000 produkt EE
- f) 2500 produkt FF
- g) 3000 produkt GG
- h) 3500 produkt HH
- i) 4000 produkt II

Markedsføringskampanjer

Du mener at det er viktig å profilere selskapet gjennom en ny markedsføringskampanje, og du vil begynne med en gang.

- a) 1440 generell kampanje nå: på firmanavnet
- b) 1260 generell kampanje om 1 år: på firmanavnet
- c) 1080 generell kampanje om 2 år: på firmanavnet
- d) 900 generell kampanje om 3 år: på firmanavnet
- e) 720 fokusert kampanje nå på produktnavnet
- f) 540 fokusert kampanje om 1 år på produktnavnet
- g) 360 fokusert kampanje om 2 år på produktnavnet
- h) 180 fokusert kampanje om 3 år på produktnavnet
- i) 0 fokusert kampanje om 4 år på produktnavnet

Distribusjon

Du vil gjerne at selskapet skal fortsette med det eksisterende nettverket av grossister, uten å utvide dette.

- a) 720 opprettholde det eksisterende nettverket av grossister
- b) 630 opprettholde det eksisterende nettverket av grossister og lokal utvidelse
- c) 540 opprettholde det eksisterende nettverket av grossister og nasjonal utvidelse
- d) 450 opprettholde det eksisterende nettverket av grossister og internasjonal utvidelse
- e) 360 opprettholde det eksisterende nettverket av grossister og nasjonal og internasjonal utvidelse
- f) 270 nytt nettverk av detaljister og lokal utvidelse
- g) 180 nytt nettverk av detaljister og nasjonal utvidelse
- h) 90 nytt nettverk av detaljister og internasjonal utvidelse
- i) 0 nytt nettverk av detaljister og nasjonal og internasjonal utvidelse

Informasjonsdirektør

Administrerende direktør skal ansette en informasjonsdirektør og du foretrekker kandidat 1.

- a) 2000 kandidat 1

- b) 1750 kandidat 2
- c) 1500 kandidat 3
- d) 1250 kandidat 4
- e) 1000 kandidat 5
- f) 750 kandidat 6
- g) 500 kandidat 7
- h) 250 kandidat 8
- i) 0 kandidat 9

Fordeling av overskudd til avdelingene

Du mener at det er best at administrerende direktør og avdelingslederne samme bestemmer hvor mye overskudd som skal deles ut. Du mener også at fordelingen skal baseres på hvor mye de enkelte avdeling har bidratt til resultatet.

- a) 0 Styret bestemmer beløp og fordeler det utifra avdelingenes behov.
- b) 720 Administrerende direktør bestemmer beløp og fordeler det utifra avdelingenes behov.
- c) 1440 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler det utifra avdelingenes behov.
- d) 2160 Styret bestemmer beløp og fordeler likt mellom avdelingene.
- e) 2880 Administrerende direktør bestemmer beløp og fordeler likt mellom avdelingene.
- f) 3600 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler likt mellom avdelingene.
- g) 4320 Styret bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.
- h) 5040 Administrerende direktør bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.
- i) 5760 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.

Strategi for patentsøknader

Tidspunktet for innsendelse av patentsøknader er en viktig beslutning. Det er vesentlig å søke tidlig (slik at du er garantert beskyttelse mot kopiering fra andre). Du mener man bør søke om patent når produkt er nesten ferdig.

- a) 2880 begynne å søke om patent når produktet er nesten ferdig
- b) 2520 begynne å søke om patent med en gang etter at produktet er ferdig
- c) 2160 begynne å søke om patent etter første test gjennom offentlige helsemyndigheter
- d) 1800 begynne å søke om patent etter andre test gjennom offentlige helsemyndigheter
- e) 1440 begynne å søke om patent etter tredje test gjennom offentlige helsemyndigheter
- f) 1080 begynne å søke om patent etter fjerde test gjennom offentlige helsemyndigheter
- g) 720 begynne å søke om patent etter femte test gjennom offentlige helsemyndigheter
- h) 360 begynne å søke om patent etter sjette test gjennom offentlige helsemyndigheter
- i) 0 begynne å søke om patent etter siste test gjennom offentlige helsemyndigheter

Du er Markedsføringsleder

Sammen med de tre andre avdelingslederne vil du derfor måtte forhandle frem en løsning på alle områder. Hvert forhandlingspunkt har ni mulige utfall, og kun ett utfall kan velges for hvert punkt.

Når det gjelder spørsmålene som skal opp på dette møtet, er du svært entusiastisk. Du håper også å komme til enighet om de sakene der du og de andre avdelingslederne kanskje har ulike preferanser.

For å hjelpe deg til å planlegge for møte var en poengsystem laget. Dette systemet formulerer dine preferanser i en tall verdi for hvert beslutningsalternativ. På den måten kan du sammenligne hvor viktige de ulike alternativene er for deg, og også hvor viktig hvert forhandlingspunkt er. Høyest oppnåelig poengsum totalt (hvis du får alle dine mest foretrukne alternativer gjennom) er 28 050 poeng, og den lavest mulige 0. Et slikt poengsystem virker kanskje litt kunstig, men det gir et godt utgangspunkt for å sammenligne og avveie mellom alternativer.

Du er Markedsføringsleder

Sammen med de tre andre avdelingslederne vil du derfor måtte forhandle frem en løsning på alle områder. Hvert forhandlingspunkt har ni mulige utfall, og kun ett utfall kan velges for hvert punkt.

Når det gjelder spørsmålene som skal opp på dette møtet, er du svært entusiastisk. Du håper også å komme til enighet om de sakene der du og de andre avdelingslederne kanskje har ulike preferanser.

For å hjelpe deg til å planlegge for møte var en poengsystem laget. Dette systemet formulerer dine preferanser i en tall verdi for hvert beslutningsalternativ. På den måten kan du sammenligne hvor viktige de ulike alternativene er for deg, og også hvor viktig hvert forhandlingspunkt er. Høyest oppnåelig poengsum totalt (hvis du får alle dine mest foretrukne alternativer gjennom) er 11 250 poeng, og den lavest mulige 0. Et slikt poengsystem virker kanskje litt kunstig, men det gir et godt utgangspunkt for å sammenligne og avveie mellom alternativer.

Forhandlingspunkter

Rapporteringsystemer

Du foretrekker at økonomiavdelingen skriver rapporten, og ber om den nødvendige informasjonen fra FoU. Du mener at FoU-avdeling bruker altfor mye tid på rapportskrivning, og at økonomiavdelingen bør ta ansvar for dette. Du ønsker derfor alternativ (i).

- a) 0 full rapport hver måned
- b) 93,75 full rapport annenhver måned
- c) 187,5 full rapport hver sjettede måned
- d) 281,25 full rapport årlig
- e) 375 kostnadsanalyse rapport hver måned
- f) 468,75 kostnadsanalyse rapport annenhver måned
- g) 562,5 kostnadsanalyse rapport hver sjettede måned
- h) 656,25 kostnadsanalyse rapport årlig
- i) 750 ingen rapport levering kun den informasjonen som økonomiavdelingen trenger

Testmetoder og teknisk utstyr for testing av nye farmasøytiske produkter

Du foretrekker at FoU-avdeling har den nyeste teknologi og beste utstyr, dvs. fire datamaskiner.

- a) 0 tradisjonell prøve og feile metode: eksisterende teknisk utstyr
- b) 187,5 tradisjonell prøve og feile metode: eksisterende teknisk utstyr med utbedringer
- c) 375 tradisjonell prøve og feile metode: nytt teknisk utstyr
- d) 562,5 tradisjonell prøve og feile metode: eksisterende teknisk utstyr og en ny datamaskin
- e) 750 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr
- f) 937,5 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og en datamaskin
- g) 1125 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og to datamaskiner
- h) 1312,5 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og tre datamaskiner
- i) 1500 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og fire datamaskiner

Produktansvar

Du mener at en individ bør ha produktansvar. Administrerende direktør bør ha produktansvar, som innebærer å koordinere aktiviteter og presse igjennom nye produkter fordi hun har mest innflytelse på styret, og hun har best oversikt over selskapet.

- a) 3000 administrerende direktør
- b) 2625 avdelingsleder økonomi
- c) 2250 avdelingsleder markedsføring
- d) 1875 avdelingsleder produksjon
- e) 1500 team bestående av administrerende direktør og avdelingslederne
- f) 1125 team bestående av avdelingslederne
- g) 750 team bestående av mellomlederne
- h) 375 team bestående av mellomledere og prosjektgruppe av ansatte
- i) 0 prosjektgruppe av ansatte

Lokaler

Leiekontrakten på de eksisterende lokalene er i ferd med å løpe ut. Du vil at selskapet skal være i de eksisterende lokalene lengst mulig. Det er veldig god å være så nær kundene. Eièren har vært flink til å vedlikeholde bygningen, og har gitt selskapet mange særfordeler.

- a) 6000 beholde eksisterende lokaler med kontrakt på 15 år
- b) 5250 beholde eksisterende lokaler kontrakt på 10 år
- c) 4500 beholde eksisterende lokaler kontrakt på 5 år
- d) 3750 nye lokaler i en forskningsparken i byen: kontrakt på 15 år
- e) 3000 nye lokaler i en forskningsparken i byen kontrakt på 10 år
- f) 2250 nye lokaler i en forskningsparken i byen kontrakt på 5 år
- g) 1500 nye lokaler i en industrisparken litt utenfor byen: kontrakt på 15 år
- h) 750 nye lokaler i en industrisparken litt utenfor byen kontrakt på 10 år
- i) 0 nye lokaler i en industrisparken litt utenfor byen kontrakt på 5 år

Produkter

Nedenfor er et utvalg av produkter med forskjellige forsknings-og produksjon spesifikasjoner, hvorav dere skal velge ett. Produktet type du helst vil ha er Produkt CC.

- a) 3000 produkt AA
- b) 2500 produkt BB
- c) 4000 produkt CC
- d) 500 produkt DD
- e) 2000 produkt EE
- f) 3500 produkt FF
- g) 0 produkt GG
- h) 1500 produkt HH
- i) 1000 produkt II

Markedsføringskampanjer

Du mener at det er viktig å profilere selskapet gjennom en ny markedsføringskampanje, og du vil begynne med en gang.

- a) 5760 generell kampanje nå: på firmanavnet
- b) 5040 generell kampanje om 1 år: på firmanavnet
- c) 4320 generell kampanje om 2 år: på firmanavnet
- d) 3600 generell kampanje om 3 år: på firmanavnet
- e) 2880 fokusert kampanje nå på produktnavnet
- f) 2160 fokusert kampanje om 1 år på produktnavnet
- g) 1440 fokusert kampanje om 2 år på produktnavnet
- h) 720 fokusert kampanje om 3 år på produktnavnet
- i) 0 fokusert kampanje om 4 år på produktnavnet

Distribusjon

Du vil gjerne at selskapet skal fortsette med det eksisterende nettverket av grossister, uten å utvide dette. Det er veldig godt, og du ser ingen grunn å forandre system. Du tror at eksisterende nettverk har de beste kontaktene og mulighetene, og at det for tidlig å utvide nettverk.

- a) 2880 opprettholde det eksisterende nettverket av grossister
- b) 2520 opprettholde det eksisterende nettverket av grossister og lokal utvidelse
- c) 2160 opprettholde det eksisterende nettverket av grossister og nasjonal utvidelse
- d) 1800 opprettholde det eksisterende nettverket av grossister og internasjonal utvidelse
- e) 1440 opprettholde det eksisterende nettverket av grossister og nasjonal og internasjonal utvidelse
- f) 1080 nytt nettverk av detaljister og lokal utvidelse
- g) 720 nytt nettverk av detaljister og nasjonal utvidelse
- h) 360 nytt nettverk av detaljister og internasjonal utvidelse
- i) 0 nytt nettverk av detaljister og nasjonal og internasjonal utvidelse

Informasjonsdirektør

Administrerende direktør skal ansette en informasjonsdirektør og du foretrekker kandidat 3.

- a) 1500 kandidat 1
- b) 1250 kandidat 2
- c) 2000 kandidat 3
- d) 250 kandidat 4
- e) 1000 kandidat 5
- f) 1750 kandidat 6
- g) 0 kandidat 7
- h) 750 kandidat 8
- i) 500 kandidat 9

Fordeling av overskudd til avdelingene

Du mener at det er beste at styret bestemmer hvor mye overskudd som skal deles ut. Du mener også at fordelingen skal baseres på avdelingenes behov.

- a) 720 Styret bestemmer beløp og fordeler det utifra avdelingenes behov.
- b) 630 Administrerende direktør bestemmer beløp og fordeler det utifra avdelingenes behov.
- c) 540 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler det utifra avdelingenes behov.
- d) 450 Styret bestemmer beløp og fordeler likt mellom avdelingene
- e) 360 Administrerende direktør bestemmer beløp og fordeler likt mellom avdelingene.
- f) 270 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler likt mellom avdelingene.
- g) 180 Styret bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.
- h) 90 Administrerende direktør bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.
- i) 0 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.

Strategi for patentsøknader

Tidspunktet for innsendelse av patentsøknader er en viktig beslutning. Du mener man bør søke om patent når alle tester av produktet er ferdig, så dere ikke kaster bort tid og penger før dere vet at produktet blir akseptert.

- a) 0 begynne å søke om patent når produktet er nesten ferdig
- b) 180 begynne å søke om patent med en gang etter at produktet er ferdig
- c) 360 begynne å søke om patent etter første test gjennom offentlige helsemyndigheter
- d) 540 begynne å søke om patent etter andre test gjennom offentlige helsemyndigheter
- e) 720 begynne å søke om patent etter tredje test gjennom offentlige helsemyndigheter
- f) 900 begynne å søke om patent etter fjerde test gjennom offentlige helsemyndigheter
- g) 1080 begynne å søke om patent etter femte test gjennom offentlige helsemyndigheter
- h) 1260 begynne å søke om patent etter sjette test gjennom offentlige helsemyndigheter
- i) 1440 begynne å søke om patent etter siste test gjennom offentlige helsemyndigheter

Du er Produksjonsleder

Sammen med de tre andre avdelingslederne vil du derfor måtte forhandle frem en løsning på alle områder. Hvert forhandlingspunkt har ni mulige utfall, og kun ett utfall kan velges for hvert punkt.

Når det gjelder spørsmålene som skal opp på dette møtet, er du svært entusiastisk. Du håper også å komme til enighet om de sakene der du og de andre avdelingslederne kanskje har ulike preferanser.

For å hjelpe deg til å planlegge for møte var en poengsystem laget. Dette systemet formulerer dine preferanser i en tall verdi for hvert beslutningsalternativ. På den måten kan du sammenligne hvor viktige de ulike alternativene er for deg, og også hvor viktig hvert forhandlingspunkt er. Høyest oppnåelig poengsum totalt (hvis du får alle dine mest foretrukne alternativer gjennom) er 28, 050 poeng, og den lavest mulige 0. Et slikt poengsystem virker kanskje litt kunstig, men det gir et godt utgangspunkt for å sammenligne og avveie mellom alternativer.

Produksjon

Sammen med de tre andre avdelingslederne vil du derfor måtte forhandle frem en løsning på alle områder. Hvert forhandlingspunkt har ni mulige utfall, og kun ett utfall kan velges for hvert punkt.

Når det gjelder spørsmålene som skal opp på dette møtet, er du svært entusiastisk. Du håper også å komme til enighet om de sakene der du og de andre avdelingslederne kanskje har ulike preferanser.

For å hjelpe deg til å planlegge for møte var en poengsystem laget. Dette systemet formulerer dine preferanser i en tall verdi for hvert beslutningsalternativ. På den måten kan du sammenligne hvor viktige de ulike alternativene er for deg, og også hvor viktig hvert forhandlingspunkt er. Høyest oppnåelig poengsum totalt (hvis du får alle dine mest foretrukne alternativer gjennom) er 11 250 poeng, og den lavest mulige 0. Et slikt poengsystem virker kanskje litt kunstig, men det gir et godt utgangspunkt for å sammenligne og avveie mellom alternativer.

Forhandlingspunkter

Rapporteringsystemer

Du foretrekker at FoU tar mer ansvar, og at de selv lager en rapport hver måned så økonomiavdelingen får bedre oversikt.

- a) 1500 full rapport hver måned
- b) 1312,5 full rapport annenhver måned
- c) 1125 full rapport hver sjettemåned
- d) 937,5 full rapport årlig
- e) 750 kostnadsanalyse rapport hver måned
- f) 562,5 kostnadsanalyse rapport annenhver måned
- g) 375 kostnadsanalyse rapport hver sjettemåned
- h) 187,5 kostnadsanalyse rapport årlig
- i) 0 ingen rapport levering kun den informasjonen som økonomiavdelingen trenger

Testmetoder og teknisk utstyr for testing av nye farmasøytiske produkter

Du foretrekker den tradisjonelle prøve-og-feil metode, med eksisterende utstyr. Du ser ingen grunn for å forandre system og investere så mye penger på nytt metoder og teknisk utstyr.

- a) 750 tradisjonell prøve og feile metode: eksisterende teknisk utstyr
- b) 656,25 tradisjonell prøve og feile metode: eksisterende teknisk utstyr med utbedringer
- c) 562,5 tradisjonell prøve og feile metode: nytt teknisk utstyr
- d) 468,75 tradisjonell prøve og feile metode: eksisterende teknisk utstyr og en ny datamaskin
- e) 375 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr
- f) 281,25 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og en datamaskin
- g) 187,5 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og to datamaskiner
- h) 93,75 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og tre datamaskiner
- i) 0 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og fire datamaskiner

Produktansvar

Du tror på team arbeid og at en prosjektgruppe av ansatte er den beste løsningen. Du foretrekker at medarbeidere som selv arbeider nær produktet også skal få ansvar for det.

- a) 0 administrerende direktør
- b) 750 avdelingsleder økonomi
- c) 1500 avdelingsleder markedsføring
- d) 2250 avdelingsleder produksjon
- e) 3000 team bestående av administrerende direktør og avdelingslederne
- f) 3750 team bestående av avdelingslederne
- g) 4500 team bestående av mellomlederne
- h) 5250 team bestående av mellomledere og prosjektgruppe av ansatte
- i) 6000 prosjektgruppe av ansatte

Produkter

Nedenfor er et utvalg av produkter med forskjellige forsknings-og produksjon spesifikasjoner, hvorav dere skal velge ett. Produktet type du helst vil ha er Produkt GG.

- a) 1000 produkt AA
- b) 1500 produkt BB
- c) 0 produkt CC
- d) 3500 produkt DD
- e) 2000 produkt EE
- f) 500 produkt FF
- g) 4000 produkt GG
- h) 2500 produkt HH
- i) 3000 produkt II

Markedsføringskampanjer

Du mener at nye reklamekampanjer først og fremst skal profilere produkter, og at eksisterende markedsføring er god nok foreløpig. Det er viktig å vente med produktprofilering til selskapet har flere produkter. Det vil ta minst 4 år.

- a) 0 generell kampanje nå: på firmanavnet
- b) 360 generell kampanje om 1 år: på firmanavnet
- c) 720 generell kampanje om 2 år: på firmanavnet
- d) 1080 generell kampanje om 3 år: på firmanavnet
- e) 1440 fokusert kampanje nå på produktnavnet
- f) 1800 fokusert kampanje om 1 år på produktnavnet
- g) 2160 fokusert kampanje om 2 år på produktnavnet
- h) 2520 fokusert kampanje om 3 år på produktnavnet
- i) 2880 fokusert kampanje om 4 år på produktnavnet

Distribusjon

Dette betyr mye for produksjonsavdelingen. Du mener at nytt nettverk og utvidelse på nasjonal og internasjonal nivå kan dere øke produksjonskapasiteten og bygge opp mer fleksibilitet.

- a) 0 opprettholde det eksisterende nettverket av grossister
- b) 720 opprettholde det eksisterende nettverket av grossister og lokal utvidelse
- c) 1440 opprettholde det eksisterende nettverket av grossister og nasjonal utvidelse
- d) 2160 opprettholde det eksisterende nettverket av grossister og internasjonal utvidelse
- e) 2880 opprettholde det eksisterende nettverket av grossister og nasjonal og internasjonal utvidelse
- f) 3600 nytt nettverk av detaljister og lokal utvidelse
- g) 4320 nytt nettverk av detaljister og nasjonal utvidelse
- h) 5040 nytt nettverk av detaljister og internasjonal utvidelse
- i) 5760 nytt nettverk av detaljister og nasjonal og internasjonal utvidelse

Lokaler

Du foretrekke å byttelokaler, og flytte til et sted som har industrikompetanse (det er veldig interessant for produksjonsavdeling) i nærheten, med mulighet å flytte igjen om 5 år.

- a) 0 beholde eksisterende lokaler med kontrakt på 15 år
- b) 375 beholde eksisterende lokaler kontrakt på 10 år
- c) 750 beholde eksisterende lokaler kontrakt på 5 år
- d) 1125 nye lokaler i en forskningsparken i byen: kontrakt på 15 år
- e) 1500 nye lokaler i en forskningsparken i byen: kontrakt på 10 år
- f) 1875 nye lokaler i en forskningsparken i byen: kontrakt på 5 år
- g) 2250 nye lokaler i en industrisparken litt utenfor byen: kontrakt på 15 år
- h) 2625 nye lokaler i en industrisparken litt utenfor byen kontrakt på 10 år
- i) 3000 nye lokaler i en industrisparken litt utenfor byen kontrakt på 5 år

Informasjonsdirektør

Administrerende direktør skal ansette en informasjonsdirektør og du foretrekker kandidat 7.

- a) 500 kandidat 1
- b) 750 kandidat 2
- c) 0 kandidat 3
- d) 1750 kandidat 4
- e) 1000 kandidat 5
- f) 250 kandidat 6
- g) 2000 kandidat 7
- h) 1250 kandidat 8
- i) 1500 kandidat 9

Fordeling av overskudd til avdelingene

Du mener at det er best at administrerende direktør og avdelingslederne samme bestemmer hvor mye overskudd som skal deles ut. Du mener også at fordelingen skal baseres på hvor mye de enkelte avdeling har bidratt til resultatet.

- a) 0 Styret bestemmer beløp og fordeler det utifra avdelingenes behov.
- b) 180 Administrerende direktør bestemmer beløp og fordeler det utifra avdelingenes behov.
- c) 360 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler det utifra avdelingenes behov.
- d) 540 Styret bestemmer beløp og fordeler likt mellom avdelingene.
- e) 720 Administrerende direktør bestemmer beløp og fordeler likt mellom avdelingene.
- f) 900 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler likt mellom avdelingene.
- g) 1080 Styret bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.
- h) 1260 Administrerende direktør bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.
- i) 1440 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.

Strategi for patentsøknader

Tidspunktet for innsendelse av patentsøknader er en viktig beslutning. Det er vesentlig å søke tidlig (slik at du er garantert beskyttelse mot kopiering fra andre). Du mener man bør søke om patent når produkt er nesten ferdig.

- a) 720 begynne å søke om patent når produktet er nesten ferdig
- b) 630 begynne å søke om patent med en gang etter at produktet er ferdig
- c) 540 begynne å søke om patent etter første test gjennom offentlige helsemyndigheter
- d) 450 begynne å søke om patent etter andre test gjennom offentlige helsemyndigheter
- e) 360 begynne å søke om patent etter tredje test gjennom offentlige helsemyndigheter
- f) 270 begynne å søke om patent etter fjerde test gjennom offentlige helsemyndigheter
- g) 180 begynne å søke om patent etter femte test gjennom offentlige helsemyndigheter
- h) 90 begynne å søke om patent etter sjette test gjennom offentlige helsemyndigheter
- i) 0 begynne å søke om patent etter siste test gjennom offentlige helsemyndigheter

Du er FoU leder

Sammen med de tre andre avdelingslederne vil du derfor måtte forhandle frem en løsning på alle områder. Hvert forhandlingspunkt har ni mulige utfall, og kun ett utfall kan velges for hvert punkt.

Når det gjelder spørsmålene som skal opp på dette møtet, er du svært entusiastisk. Du håper også å komme til enighet om de sakene der du og de andre avdelingslederne kanskje har ulike preferanser.

For å hjelpe deg til å planlegge for møte var en poengsystem laget. Dette systemet formulerer dine preferanser i en tall verdi for hvert beslutningsalternativ. På den måten kan du sammenligne hvor viktige de ulike alternativene er for deg, og også hvor viktig hvert forhandlingspunkt er. Høyest oppnåelig poengsum totalt (hvis du får alle dine mest foretrukne alternativer gjennom) er 28 050 poeng, og den lavest mulige 0. Et slikt poengsystem virker kanskje litt kunstig, men det gir et godt utgangspunkt for å sammenligne og avveie mellom alternativer.

Du er FoU leder

Sammen med en annen avdelingsleder vil du derfor måtte forhandle frem en løsning på alle områder. Hvert forhandlingspunkt har ni mulige utfall, og kun ett utfall kan velges for hvert punkt.

Når det gjelder spørsmålene som skal opp på dette møtet, er du svært entusiastisk. Du håper også å komme til enighet om de sakene der du og den andre avdelingsleder kanskje har ulike preferanser.

For å hjelpe deg til å planlegge for møte var en poengsystem laget. Dette systemet formulerer dine preferanser i en tall verdi for hvert beslutningsalternativ. På den måten kan du sammenligne hvor viktige de ulike alternativene er for deg, og også hvor viktig hvert forhandlingspunkt er. Høyest oppnåelig poengsum totalt (hvis du får alle dine mest foretrukne alternativer gjennom) er 11 250 poeng, og den lavest mulige 0. Et slikt poengsystem virker kanskje litt kunstig, men det gir et godt utgangspunkt for å sammenligne og avveie mellom alternativer.

Du er FoU leder

Sammen med de tre andre avdelingslederne vil du derfor måtte forhandle frem en løsning på alle områder. Hvert forhandlingspunkt har ni mulige utfall, og kun ett utfall kan velges for hvert punkt.

Når det gjelder spørsmålene som skal opp på dette møtet, er du svært entusiastisk. Du håper også å komme til enighet om de sakene der du og de andre avdelingslederne kanskje har ulike preferanser.

For å hjelpe deg til å planlegge for møte var en poengsystem laget. Dette systemet formulerer dine preferanser i en tall verdi for hvert beslutningsalternativ. På den måten kan du sammenligne hvor viktige de ulike alternativene er for deg, og også hvor viktig hvert forhandlingspunkt er. Høyest oppnåelig poengsum totalt (hvis du får alle dine mest foretrukne alternativer gjennom) er 11 250 poeng, og den lavest mulige 0. Et slikt poengsystem virker kanskje litt kunstig, men det gir et godt utgangspunkt for å sammenligne og avveie mellom alternativer.

Forhandlingspunkter

Rapporteringsystemer

Du foretrekker at økonomiavdelingen skriver rapporten, og ber om den nødvendige informasjonen fra FoU. Du mener at avdelingen din bruker altfor mye tid på rapportskrivning, og at økonomiavdelingen bør ta ansvar for dette. Du ønsker derfor alternativ (i).

- a) 0 full rapport hver måned
- b) 375 full rapport annenhver måned
- c) 750 full rapport hver sjette måned
- d) 1125 full rapport årlig
- e) 1500 kostnadsanalyse rapport hver måned
- f) 1875 kostnadsanalyse rapport annenhver måned
- g) 2250 kostnadsanalyse rapport hver sjette måned
- h) 2625 kostnadsanalyse rapport årlig
- i) 3000 ingen rapport levering kun den informasjonen som økonomiavdelingen trenger

Testmetoder og teknisk utstyr for testing av nye farmasøytiske produkter

Du foretrekker at avdelingen din bruker den nyeste teknologien og har best mulig utstyr. Det er viktig å bruke ny teknologi, og at du har nok datamaskiner (4) slik at nytt utstyr kan brukes mest mulig effektivt.

- a) 0 tradisjonell prøve og feile metode: eksisterende teknisk utstyr
- b) 750 tradisjonell prøve og feile metode: eksisterende teknisk utstyr med utbedringer
- c) 1500 tradisjonell prøve og feile metode: nytt teknisk utstyr
- d) 2250 tradisjonell prøve og feile metode: eksisterende teknisk utstyr og en ny datamaskin
- e) 3000 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr
- f) 3750 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og en datamaskin
- g) 4500 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og to datamaskiner
- h) 5250 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og tre datamaskiner
- i) 6000 ny atomkonstruksjons metode: (krever) nytt teknisk utstyr og fire datamaskiner

Produktansvar

Du tror på team arbeid og at en prosjektgruppe av ansatte er den beste løsningen. Du foretrekker at medarbeidere som selv arbeider nær produktet også skal få ansvar for det.

- a) 0 administrerende direktør
- b) 187,5 avdelingsleder økonomi
- c) 375 avdelingsleder markedsføring
- d) 562,5 avdelingsleder produksjon
- e) 750 team bestående av administrerende direktør og avdelingslederne
- f) 937,5 team bestående av avdelingslederne
- g) 1125 team bestående av mellomlederne
- h) 1312,5 team bestående av mellomledere og prosjektgruppe av ansatte
- i) 1500 prosjektgruppe av ansatte

Lokaler

Du foretrekke å bytte lokaler, og flytte til et sted som hvor du finnes industrikompetanse i nærheten, med mulighet å flytte igjen om 5 år. Forskningsparken er ikke så god som industriparken, fordi industriparken er ny og der brukes de ny produkt teknologi.

- a) 0 beholde eksisterende lokaler med kontrakt på 15 år
- b) 93,75 beholde eksisterende lokaler kontrakt på 10 år
- c) 187,5 beholde eksisterende lokaler kontrakt på 5 år
- d) 281,25 nye lokaler i en forskningsparken i byen: kontrakt på 15 år
- e) 375 nye lokaler i en forskningsparken i byen: kontrakt på 10 år
- f) 468,75 nye lokaler i en forskningsparken i byen: kontrakt på 5 år
- g) 562,5 nye lokaler i en industrisparken litt utenfor byen: kontrakt på 15 år
- h) 656,25 nye lokaler i en industrisparken litt utenfor byen kontrakt på 10 år
- i) 750 nye lokaler i en industrisparken litt utenfor byen kontrakt på 5 år

Produkter

Nedenfor er et utvalg av produkter med forskjellige forsknings-og produksjon spesifikasjoner, hvorav dere skal velge ett. Produktet type du helst vil ha er Produkt AA.

- a) 4000 produkt AA
- b) 3500 produkt BB
- c) 3000 produkt CC
- d) 2500 produkt DD
- e) 2000 produkt EE
- f) 1500 produkt FF
- g) 1500 produkt GG
- h) 500 produkt HH
- i) 0 produkt II

Markedsføringskampanjer

Du mener at nye reklamekampanjer først og fremst skal profilere produkter, og at eksisterende markedsføring er god nok foreløpig. Det er viktig å vente med produktprofilering til selskapet har flere produkter. Det vil ta minst 4 år.

- a) 0 generell kampanje nå: på firmanavnet
- b) 90 generell kampanje om 1 år: på firmanavnet
- c) 180 generell kampanje om 2 år: på firmanavnet
- d) 270 generell kampanje om 3 år: på firmanavnet
- e) 360 fokusert kampanje nå på produktnavnet
- f) 450 fokusert kampanje om 1 år på produktnavnet
- g) 540 fokusert kampanje om 2 år på produktnavnet
- h) 630 fokusert kampanje om 3 år på produktnavnet
- i) 720 fokusert kampanje om 4 år på produktnavnet

Distribusjon

Du foretrekker en forandring i eksisterende nettverket og du tror at selskapet bør fokusere på kunder (sluttbruker) på det nasjonal og internasjonal nivå.

- a) 0 opprettholde det eksisterende nettverket av grossister
- b) 180 opprettholde det eksisterende nettverket av grossister og lokal utvidelse
- c) 360 opprettholde det eksisterende nettverket av grossister og nasjonal utvidelse
- d) 540 opprettholde det eksisterende nettverket av grossister og internasjonal utvidelse
- e) 720 opprettholde det eksisterende nettverket av grossister og nasjonal og internasjonal utvidelse
- f) 900 nytt nettverk av detaljister og lokal utvidelse
- g) 1080 nytt nettverk av detaljister og nasjonal utvidelse
- h) 1260 nytt nettverk av detaljister og internasjonal utvidelse
- i) 1440 nytt nettverk av detaljister og nasjonal og internasjonal utvidelse

Informasjonsdirektør

Administrerende direktør skal ansette en informasjonsdirektør og du foretrekker kandidat 9.

- a) 0 kandidat 1
- b) 250 kandidat 2
- c) 500 kandidat 3
- d) 750 kandidat 4
- e) 1000 kandidat 5
- f) 1250 kandidat 6
- g) 1500 kandidat 7
- h) 1750 kandidat 8
- i) 2000 kandidat 9

Fordeling av overskudd til avdelingene

Du mener at det er beste at styret bestemmer hvor mye overskudd som skal deles ut. Du mener også at fordelingen skal baseres på avdelingenes behov.

- a) 2880 Styret bestemmer beløp og fordeler det utifra avdelingenes behov.
- b) 2520 Administrerende direktør bestemmer beløp og fordeler det utifra avdelingenes behov.
- c) 2160 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler det utifra avdelingenes behov
- d) 1800 Styret bestemmer beløp og fordeler likt mellom avdelingene
- e) 1440 Administrerende direktør bestemmer beløp og fordeler likt mellom avdelingene.
- f) 1080 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler likt mellom avdelingene.
- g) 720 Styret bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet
- h) 360 Administrerende direktør bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.
- i) 0 Administrerende direktør og avdelingsledene bestemmer beløp og fordeler det utifra avdelingenes bidrag til resultatet.

Strategi for patentsøknader

Tidspunktet for innsendelse av patentsøknader er en viktig beslutning. Du mener man bør søke om patent når alle tester av produktet er ferdig, så dere ikke kaster bort tid og penger før dere vet at produktet blir akseptert.

- a) 0 begynne å søke om patent når produktet er nesten ferdig
- b) 720 begynne å søke om patent med en gang etter at produktet er ferdig
- c) 1440 begynne å søke om patent etter første test gjennom offentlige helsemyndigheter
- d) 2160 begynne å søke om patent etter andre test gjennom offentlige helsemyndigheter
- e) 2880 begynne å søke om patent etter tredje test gjennom offentlige helsemyndigheter
- f) 3600 begynne å søke om patent etter fjerde test gjennom offentlige helsemyndigheter
- g) 4320 begynne å søke om patent etter femte test gjennom offentlige helsemyndigheter
- h) 5040 begynne å søke om patent etter sjette test gjennom offentlige helsemyndigheter
- i) 5760 begynne å søke om patent etter siste test gjennom offentlige helsemyndigheter

Appendix V

Calculation of the Nash solution

The Nash solution was introduced as a solution which maximises the product of the parties outcomes (Raiffa, 1982). It requires that the utilities be rescaled with respect to the utility of the point at which the negotiator would prefer no settlement. The no settlement point in our tasks is 0, so the bargaining zone begins at this 0 point. The current task is structured such that *Nash solution represents the solution with the highest joint profit, and an equal distribution of resources for all the parties.* Based on the payoff matrixes (see this Appendix II) the Nash solutions for the games are given in the table below. These individual profits maximise the products of the parties' outcomes.

Individual outcomes with a Nash Solutions for the tasks

	Four issues				10 issues			
	Party 1		Party 2		Party 1		Party 2	
Dyad	7500		7500		17700		17700	
	Party 1	Party 2	Party 3	Party 4	Party 1	Party 2	Party 3	Party 4
Group	7500	7500	7500	7500	17700	17700	17700	17700

The calculation of the Nash solution will be illustrated by examining the dyadic, low issue complexity task. To calculate the Nash point based on the results of maximising the products, the equation is simply, \sqrt{XY}

Where X equals party 1's profits that maximise joint outcome and Y equals party 2's profits that maximise joint outcome. For my task the Nash solution = $\sqrt{7500 \times 7500} = 7500$.

All agreements in our research were measured as the distance from the calculated Nash solution. For example, if a dyad reaches an agreement where party 1 achieves 6000 and party 2 achieves an outcome of 3750, the distance of this agreement from the Nash Solution would be determined by first calculating the score of the agreement achieved $\sqrt{X'Y'}$ and then subtracting the score of the agreement achieved from the Nash solution $\sqrt{XY} - \sqrt{X'Y'}$

X^1Y^1 are simply the profits earned by the two parties' agreement.

$$\sqrt{X^1Y^1} = \sqrt{6000 \times 3750} = 4743.42.$$

We then set the Nash solution of 7500 to 1 by dividing both solutions by 7500. We are left with the distance from the Nash solution of 36.75. For ease of interpretation we will report the distance towards the Nash solution which would give us 63.245. The higher the score the closer the agreement is to the Nash solution.

For the group tasks similar procedures were used to calculate the distances of the solutions achieved from the Nash solution except points and distances were calculated using a root of 4, ($\sqrt[4]{}$).